# Mobile pastoralist groups and the Palmyrene in the late Early to Middle Bronze Age (c. 2400-1700 BCE):

## An archaeological synthesis based on a multidisciplinary approach focusing on satellite imagery studies, environmental data, and textual sources

Dissertation presented for the degree of philosophiae doctor (PhD) at the

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University of Bergen (UiB)

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2014

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## Acknowledgements

First things first – the Palmyrena project members. I am indebted to Professor Jørgen Christian Meyer for initiating the project, taking me on board, believing in my project, showing me around his beloved Syria and the Palmyrene, and in general for being a great guy. Also, my sincere thanks to Prof. Meyer and Dr. Nils Anfinset for their indispensible help as mentors, supervisors, and colleagues. They have helped me through many a struggling situation and have been key to the completion and submission of this dissertation. Finally, I have to thank Dr. Eivind Heldaas Seland for his inspiring collegiality, social nature, and academic know-how.

I want to thank my parents, Bjørn and Solveig, and my sister, Ragnhild, for their unquestionable support throughout the years it took me to carry out the research and write this study, helping me in all manners possible, and always welcoming me home to Kristiansand. I would also like to thank all my friends and relations for their interest in my work and participation in social activities when I needed a break, and all my colleagues in academic institutions with which I have conversed, debated, and socialised.

My sincere appreciation and gratitude to all my Syrian friends who has assisted myself and the project in professional and social capacities and will always be remembered for their boundless hospitality – Adeeb (Abu Badia), Naim and the Turki family, Abdulbasit and Waleed in the Palmyra museum, Fuaz, my friends Hassan, Ahmed, and Abdu, and all other relations in Palmyra. In addition, my heartfelt thanks to friends from other parts of Syria – Raed from Deir ez-Zor and Mohammed from Latakia. I am so grateful for my time in Syria and the exclusively and utterly positive encounters I had with its fantastic people. The whole situation at the time of writing is deeply tragic on all levels.

My penultimate gratitude goes to Professor Graham Philip and Professor Daniele Morandi Bonacossi for valuable advise and input given at crucial times during the initial phases of this production, which was a great help in guiding me toward the methods and results I have obtained here. In continuance of this, I have to recognise all the scholars and research projects carrying out research into Syrian Bronze Age topics on whose shoulders I stand and without which I would never have been able to contextualise the material.

Finally, my heartfelt gratitude to Google. Keep information open and accessible.

# 1 Introduction

When the Austrian traveller Aloïs Musil traversed the Palmyrene from Tadmor to Isriyeh and Resafa in 1912, he used these words to describe the area stretching northward from the the ruined Roman city through the dry steppe highlands:

*"At 8.43 we reached the top of the height of at-Tenâja, which is a southwestern spur of the Târ an-Nwejser. On nearly every hilltop were seen heaps of stones or the remains of watchtowers. (…) The nearer we approached, the more distinctly could be seen the groups of trees in the western part of the al-Abjaz mountains. These are especially numerous on both sides of the Wadi Dekara"* (Musil 1928:147).

The first striking aspect of this description is its reference to the tree-clad slopes on both sides of Wadi Takara, i.e. the foothills of Jebel Abyad (*al-Abjaz*) and hills of Jebel Homr ez Jazal (cf. appendix 3, p. I-II, areas 7, 9, and 10). These areas are today utterly devoid of any vegetation taller than herbs and grasses, suggesting that Musil merely a hundred years ago must have traversed a very different landscape than the one met by anyone travelling through the Palmyrene today (cf. **Figure 1.1**).

The other intruiging piece of information discerned is his interpretation of the ancient remains he noticed along the mountain ridges and hilltops. Like Poidebard (1934) did only six years after Musil published his travel accounts, he related all those he came across in the Palmyrene landscape to the ancient city of Palmyra – *the bride of the desert* [sic][1] – and thus to Roman presence in the region during Classical times. In such a context both Musil and Poidebard interpreted the *heaps of stones* as ruined watchtowers (cf. **Figure 4.41**). One cannot blame them, as these structures can appear tower-like, with walls of dressed stones, and are often located in places with views far and wide across the steppe. In addition, they did not have the luxury of a century of archaeological research to lean on. However, there is no doubt now that the structures witnessed by these early-20th century CE explorers in fact were burial monuments, in many cases constructed thousands of years prior to the Roman occupation of Syria by people inhabiting the Palmyrene during the Bronze Age.

[1] While this poetic designation of the ruined city is both alluring and evocative, it would not be correct to call the regional environment a desert. The lowland Palmyrene is a dry steppe and the highlands could until the 20th century CE be called a terebinth woodland steppe (cf. 2.3 and 2.7)

**Figure 1.1:** View toward the western side of Wadi Takara during the spring of 2011, where the *especially numerous trees* noted by Musil (1928) have all been destroyed some time in the passing 99 years. His *watchtowers on the hilltops* now seem much more likely to have been monuments for the dead constructed millennia before the Romans ruled the Near East by people practicing a lifestyle similar to that seen here – seasonal mobile ovicaprine pastoralism.

## 1.1 The Palmyrena project

The full title of the joint Syrian-Norwegian archaeological research project was «Palmyrena: City, Hinterland and Caravan trade between the Occident and the Orient» (cf. Meyer 2009; 2011; Anfinset 2009; 2013; also cf. www.org.uib.no/palmyrena). Initially a four-year venture (2009-2012) funded by the Norwegian Research Council, it ended officially in June of 2013, after which publications were and are expected to follow regularly. The geographic focus for the project was the city of Palmyra – in modern times called Tadmor – where an oasis has provided basis for settlement in the central Syrian dry steppe for millennia, most notably during the Roman period, when it grew to one of the most important cities of the Empire. However, the main locus for active research and data collection was the northern hinterland of Palmyra – the Palmyrene or Palmyrena (cf. appendix 2, pp. I-II), toponyms which in this dissertation will be used interchangably. Chronologically, the project was divided into two main parts:

- Historic periods, which stretched from Hellenistic times to the Islamic periods, but with a main focus settlement, structures, and networks during the Roman and Byzantine eras. This was studied on two levels, one regional – i.e. Palmyra and its hinterland – and one superregional – i.e. the role of Palmyra in networks connecting the Orient and the Occident.
- Prehistoric periods – of which this dissertation is a part – which more or less concerned on the millennia prior to Hellenistic times, but with a clear focus on the Neolithic and the Bronze Age.

One objective for the prehistoric part of the Palmyrena project was to document subsistence strategies in the Palmyrene dry steppe through the ages, from the integrated perspectives of diachronic climatic developments, environmental contexts, and socioeconomic organisation. To achieve this, the team ground surveyed large tracts of the Jebel Abyad and Jebel Merah mountain chains and the landscapes immediately surrounding these. The exploration and prospection of 2008 had identified a number of archaeological structures distributed throughout the landscape, including unmistakable burial monuments of various shapes and sizes in vast numbers, as well as the occasional structure known as «desert kites» (e.g. Helms & Betts 1987),  all of which had lain undocumented by archaeologists working from Palmyra throughout the 20th century CE and – regarding the tumuli – only just recently been noted by projects surveying other parts of Syria (cf. 4.7). Thus, the fieldwork of 2009 and 2011 aimed to explore the region and survey as many sites as possible, noting structure types, shapes, sizes, conditions, associated small finds, archaeological contexts (i.e. association with other structures), and their landscape contexts (also cf. 4.1.2). While the assemblage of surveyed sites included a small number of kites and stone enclosures, as well as several open-air sites and rockshelters, tumuli or burial cairns comprise by far the majority of archaeological structures documented in the Palmyrene highlands by the prehistoric team. In addition to the objective of integrating archaeology with landscape, the overarching uncertainties concerned the who, the when, and the why. Who erected these tumuli? When were they construced? What was their purpose in these societies and in the landscape?

## 1.2 Objectives for this dissertation

The initial prospection report from the Palmyrena project (cf. Meyer 2008, p. 124) noted that local clusters of tumuli in the Jebel Merah area could represent territorial markers by the population who constructed them, although their purpose was far from clear. The project mentioned a relatively far-reaching communicative aspect of the larger tumuli on the Palmyrene ridges, which to some degree seemed to mark the route crossing the region from Palmyra and northward. Finally, a distinctive lack of such structures for other landscapes was also recognised. An open question was raised – how did the region look during the Bronze Age?

### 1.2.1 Aims of research

These concepts summarise in short the main questions I intend to explore and try to answer with this dissertation. The Palmyrene problem is that the region has played a very limited role in archaeological research into Bronze Age topics, and by far most of the 20th century CE studies have focused on the large settlements or cities and the cultivated zones as their focus. Fortunately, this has changed in the last 15 years, with steppe landscapes and their population increasingly being put under investigation. In addition, new approaches – particularly large-scale remote sensing – have greatly expanded the field of archaeological method and data collection (e.g. Bradbury 2011, p. 164). The primary question here concerns land use and the physical manifestation of archaeological structures in the Palmyrene. The notable patterns in tumulus distribution as well as in structure form and relations initially documented seem to suggest a phenomeon associated with mobile pastoralist groups exploiting the region during the Bronze Age. While this should be considered the main hypothesis put forward for this dissertation, as an assumption it is not necessarily straightforward and should be investigated further by various means.

Based on an expanded survey of the Palmyrene using satellite imagery from both commercially available images and the recently (since 2010) available high-resolution imagery of large parts of the region in Google Earth, I aim to augment the picture of tumulus distribution patterns by vastly increasing the data set available through remote-sensing methods and analyse the results on a micro- and macrolevel perspective. In addition, the two other structure types recorded in the Palmyrene – stone enclosures and kites – are also easily surveyed using this method, and as all three of them are included in what Zarins (1992, p. 50) called the *pastoral nomadic technocomplex* of the Near Eastern Chalcolithic and Early Bronze Age (cf. 4.1.1), I will also integrate these in the analysis of Palmyrene land use and its link to the archaeological remains recorded across the steppe.

The connection between these structures and mobile pastoralism is also hypothetical for the tumuli documented by the Palmyrena project, but as Zarins suggested 20 years ago, and has been increasingly supported in later years (e.g. Castel 2008, p. 306), although also within a context of multi-resource strategies (Bradbury 2011, p. 438). I intend to explore this aspect of the Palmyrene, within the hypothesis that many of the monuments represent a direct expression of territoriality by mobile groups practicing *seasonal* exploitation of the region, mainly through the pasturing of ovicaprine herds, but also including an aspect of multi-resource subsistence with a certain amount of hunting and small-scale horticulture – all of which arguably is represented by Palmyrene structures. One important source of information here will be the ancient texts concerning these matters, and above all the Mari archives. Finally, there are some climatic and environmental questions I intend to consider. First, is the discrepancy between Musil's description and the current state of the Palmyrene indeed an actual development of the century that separates the two perspectives? Second, what characterised the landscapes and ecologies of Syria during the Bronze Age, and particularly its steppe biomes? Third, the data sources concerning climatic developments through the Bronze Age show considerable diachronic deterioration in climatic conditions in the Near East, with particularly dramatic events during the EBA IV. What was the nature of such climate change through the period and what did that entail for Near Eastern populations?

Evidently, the Palmyrene is the geographical focus of this dissertation, but in many contexts the spatial horizon will be widened to include the entire Near East, which i.e. is here defined as the region from the Levant to the Zagros, and from the southern foothills of Anatolia to the Al-Hamad (cf. fig. 2.1). My chronological horizon will be c. 2400-1700 BCE, which comprises the archaeological periods EBA IV and MBA (cf. 3.1.2 for further elaboration). There are several reasons for this. First, the available evidence from dated structures suggests that the later 3rd millennium and early 2nd millennium BCE is a period of expansion into sub-optimal landscapes, such as the Palmyrene dry steppe (cf. Bradbury 2011, p. 300), which also seems to be accompanied by increased mobility and changes in pastoral production possibly as a result of environmental stress (e.g. Wossink 2009, pp. 146-147). This latter aspect is often linked to dramatic events in the climatic developments toward the end of the 3rd millennium BCE, which I would argue supports the use of a temporal horizon which includes both conditions just prior to and following these circumstances. The final argument for my chronological boundaries is that it allows me to use invaluable textual material from Bronze

Age archives which provide great access to detailed information concerning the societies inhabiting the Near East and their relationship with each other and the landscape.

### 1.2.2 The synthesis approach

The lack of large-scale research relating to the Bronze Age Palmyrene requires me to take a wide approach to the problems I intend to investigate. I will have to collect information from a number of disciplines, many in which I consider myself a relative novise, in order to paint a coherent picture of the archaeological, historical, topographical, environmental, and socioeconomic contexts which surround these questions. For instance, if I take geography out of this equation, I tend to think that the remaining elements would suffer. On the other hand, I belive that the inclusion of a wide array of disciplines to the study of archaeology also will create a synergetic effect, i.e. that this research as an integrated totality exceeds the sum of each aspect put together. Therefore I am determined to carry out the exploration of Palmyrena in the Bronze Age as a synthesis, which will include various amounts of climatology, ecology, epigraphy, Assyriology, ethnography, geography, and other fields of research. However, these disciplines all play a supplementary role, as this still is an archaeological investigation, with the data primarily consisting of archaeological structures and the analyses always being conducted with these in mind.

## 1.3 Clarifications

Due to the synthesis approach, this dissertation will contain several expressions of technical, structural, and linguistic nature, which I think would be prudent to clarify in advance. Firstly, a large number of ancient texts will be presented or referred to in certain contexts. The ones found in the text itself are listed and briefly described in the preface, immediately following the list of content, figures, and tables. In cases where one or more crossreferences to texts are provided they will include «text» followed by a **bold** reference formatted by chapter and number – e.g. text **5.1**. This is to separate them from ancient texts found in other works, which will use the format in the relevant study – e.g. texts **26 283** or **FM 2 62** in Heimpel (2003, pp. 285, 519) (cf. 5.2.1.4). Another technical aspect regarding the use of texts is that my own clarifying comments to the content will be put in in brackets, to separate them from the author’s content.

Not being particularly well-versed in neither Akkadian nor Amorrite, I will take a very simplistic approach to the use of ancient terms (e.g. cf. Fleming 2004, pp. 4-5). I will stick to the nominative singular of nouns (e.g. *sugagum*), also in contexts where the plural (*sugagu*) would be more appropriate. However, in general it will be implicitly understood from the context whether it refers to singular or plural, if at all relevant. The same will mostly be the case for proper names, especially regarding tribal names, where I will tend to use e.g. *Rabbum* instead of *Rabbu*. Also, whenever an ancient term is used in the text, it would be written in *cursive* to distinguish it from regular English, and its meaning can be found in the text surrounding its first use (also cf. **Table 5.1**).

Variations in local Arabic toponyms may also occur, particularly in cases including *kh* vs. *h*. While the rivers Habur (vs. Khabur) and Balih (vs. Balikh) or the village Suhne (vs. Sukhne) are as large, well-known names, consistently written with *h*, minor local names, such as small wadis have been rendered as found in maps, mainly due to my own uncertainty regarding their spelling in this respect, such as e.g. Wadi el Kheurbet Khairem (vs. Wadi el Heurbet Hairem). The same is consistently the case with *a* vs. *ā* in both modern and ancient names. However, all relevant toponyms or homonyms from Bronze Age sources have been written with the *Š/š* occurring ubiquitously in all contexts, which is pronounced [sh], e.g. as in *Šamši-Addu* – which incidently will be spelled using the Amorrite version *-Addu* instead of Akkadian *-Adad* (mainly cf. 3.4.2).

Finally, I will use the format BCE/CE (before common era/common era) in all contexts involving calendrical years as a more neutral form of the BC/AD designation. However, when discussing climatic data and the natural sciences, I will apply BP (before present), denoting "years ago".

## 1.4 Outline of dissertation

This dissertation will be divided by chapters into topics, although it would be almost impossible to discuss each of these themes in isolation, and thus links to other chapters and related figures will consistently be included throughout the text for easy crossreference.

Chapter 2 will provide an overview of landscapes and natural processes in the geographic region that is Syria. This will have a descriptive purpose, where many aspects of the

Palmyrene steppe will be presented and form an environmental basis for subsequent discussions. Elements regarding climate, seasons, and hydrological matters are in my view key to understand ancient land use in this region. But as shown above, these environments have changed during the last century, developments which I will discuss in this chapter. Thereafter, I will consider how the Near Eastern climate could have changed diachronically during the Bronze Age and what that could have entailed for affected populations. Finally, I will try to reconstruct the ancient natural environments of Syria, as it must have been quite a different landscape to the one I have experienced myself.

Chapter 3 will consider historical aspects of Syro-Mesopotamia, as I intend to include a number of archival texts to shed light on ancient practices and developments. Here I will consider issues regarding chronology and provide arguments for my own simplistic periodisation. Then I intend to discuss the use of ancient texts as a resource, present the main archives, and briefly deal with the very few attestations of Palmyra in Bronze Age sources. After a brief look at ancient populations of the Near East and their languages, I will finally provide an overview of geopolitical developments for the period in question, c. 2400-1700 BCE.

Chapter 4 will be the part dealing with the primary data from the ground survey carried out by the Palmyrena project, including defining typologies and analyses of structural, topographic, and communicative aspects. It is also where the method of satellite imagery survey is introduced in full, with considerations of method of execution and issues complicating these studies. A large portion of this chapter will focus on the results and interpretations from the study of Google Earth imagery of the Palmyrene, which has greatly increased the amount of data available for analyses and provided many new perspectives. Finally, aspects of dating and a thorough overview and analysis of comparative research will conclude chapter 4.

Chapter 5 will focus entirely on mobile pastoralism as a subsistence strategy in recent and ancient past, as well as on tribes as kinship groups of social organisation. Both these concepts will be discussed through the use of both comparative and anecdotal evidence, the latter of which has lately been significantly augmented by new translations, as well as recent reevaluations and reinterpretations. I will look at older theories which do not seem to hold water anymore, and try to integrate new theories with archaeological data and ancient texts. Finally, edging toward the conclusion of this dissertation, I will integrate concepts presented and explained in chapter 5 with the burial monuments presented in detail in chapter 4 and found throughout most of the Palmyrene.

Chapter 6 will be a summary of the topics dealt with in the course of the dissertation and integrate them with each other in order to provide an explanation for the problems outlined here (cf. 1.2.1) and interpret the archaeology of Palmyrena in the contexts of landscape, social and economic organisation, and subsistence strategies in a diachronic perspective from the EBA to the MBA.

Appendices will follow the reference list and include a detailed list of the analysis of ground-surveyed tumuli (appendix 1), maps including the Palmyrena project concession area and acquired satellite imagery (appendix 2), topographical division of the Palmyrene and detailed results of the Google Earth survey (appendix 3), and detailed distribution maps of the tumuli recorded for each of the Palmyrene landscapes (appendix 4).

## 1.5 Summary and conclusions

This chapter has presented the basis for initiating the investigation which will follow, namely the surveys and research by the Palmyrena project, as well as the aims I indent to achieve with this dissertation. These can briefly be summarised as follows: 1) expanding the data set for analyses of Palmyrene matters, 2) explore how the area was used during the Bronze Age, 3) investigate links between archaeological remains in this region and mobile pastoralist groups, and 4) look at Palmyrene climatic and environmental conditions and developments – all presented within a synthesis approach. I have also briefly clarified certain technical aspects for the dissertation, and summarised the content of each chapter and the appendices.

# 2 Climatic and environmental contexts

The Near East comprises a number of integrated environments and human societies have been able to inhabit or make use of nearly all parts of this varied region. However, some areas could be characterised as varying between the habitable and the inhospitable on a seasonal level (cf. 2.2.1 and 2.2.2) and may be vulnerable faced with climatic or environmental changes. Key to survival for populations using such biomes for their subsistence seems to be dependent on adaptation and flexibility (cf. 5.1.3 and 5.2.1). Thus, a study of societies associated with such environments demands attention to climatic considerations to provide a proper context for the archaeological material they leave behind and the textual sources attesting their various practices. This focus becomes especially relevant when trying to understand diachronic developments or societal responses to changing surroundings. This chapter aims to address the climatic and environmental basis of such questions in two parts.

In the first part, I will present a geographical description of the region, with a focus on regional geology and hydrology in general and the Palmyrene in particular (cf. 2.1), followed by a look at the current climatic conditions and mechanisms that lie behind them in this part of the Near East (cf. 2.2). Based on these data, I will show how the specific conditions affect regional biomes and local environmental variations in Syria, mainly its central parts (cf. 2.3). A recurring theme in this respect seems to be the extensive and deteriorating effects caused particularly by modern human exploitation of the environment and its consequences, but in some cases also by interactions in the past.

The second part will focus on climatic and environmental conditions during the Early to Middle Bronze Age in the Near East, with a particular emphasis on the Palmyrene and the period c. 2400-1700 BCE. The aim is to track diachronic developments in this respect and address the potential for significant climatic and environmental differences compared to the modern regime. This will include an assessment of proxy data sources relating to climatic variations and results of their analyses (cf. 2.4 and 2.5), which thereafter will be combined with the discussions of the first part to form an environmental picture of Bronze Age Palmyrene for contextual purposes (cf. 2.6 and 2.7). Additionally, the assessment will create a foundation which later discussions on mobile pastoralism in light of climatic developments during the EBA and MBA can be superimposed.

## 2.1 Geographical aspects

### 2.1.1 Geology and topography

The western parts of Syria form the very edge of the vast African continental plate, while the remaining majority, including the Palmyrene, belongs to the Arabian plate (Moore et al. 2000, p. 43, also cf. Lewin & Woodward 2009, p. 294, fig. 10.6.a; Searle 1994, p. 1333, fig. 1). The seam between these two shelves makes the former areas of the country tectonically unstable, while the latter are generally characterised as stable. The steppes of the central Palmyrene and the Jezire (**Figure 2.1**) have therefore much greater rigidity and resistance to crustal movements (Wirth 1971, p. 43). The main tectonic direction of contact between these plates emerges repeatedly in a southwestern-northeastern pattern, evident in the mountain ranges stretching in such a fashion from Damascus to the Euphrates and beyond, or indeed the directional course of the Habur (Wirth 1971, p. 46; also cf. **Figure 2.1** and **Figure 2.2**).

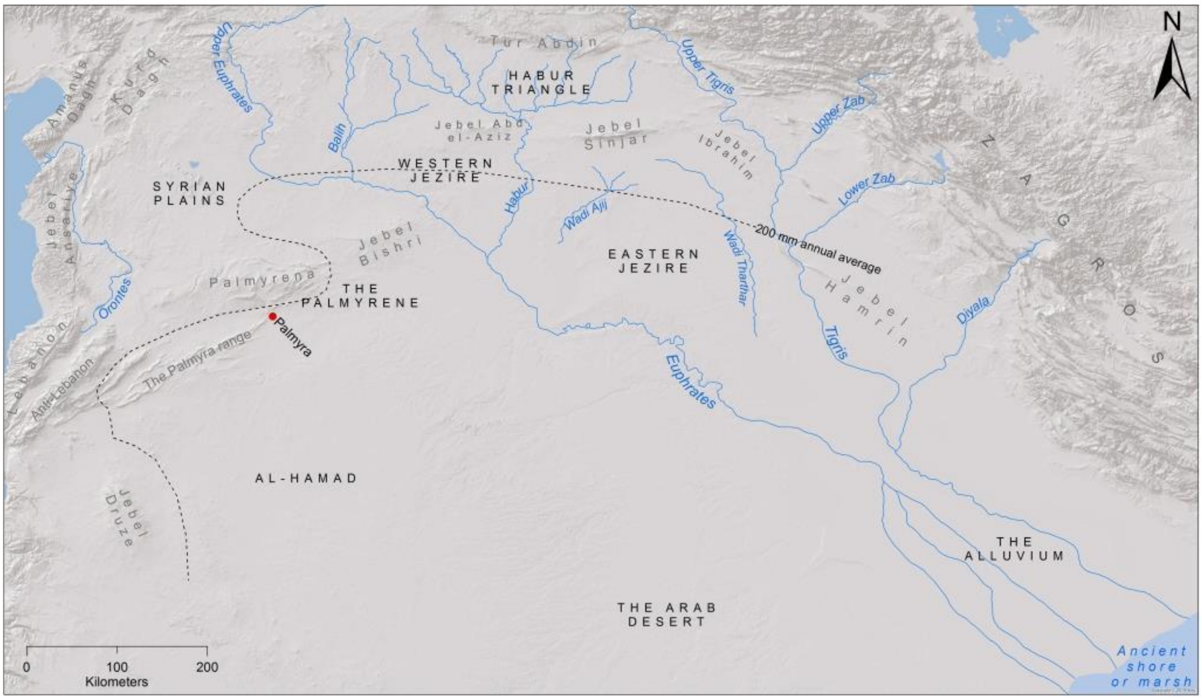



**Figure 2.1:** Map of the Near East and the physical features in the region playing a part in this study. Note how the steppe mountain ranges tend to be aligned in a southwestern-northeastern direction, and that certain waterways – namely Wadi Ajij and Wadi Thartar – in fact do not naturally empty out in one of the larger rivers. An estimation of the ancient shoreline or extent of marshland at the head of the Persian Gulf is indicated on all such maps, following descriptions in Postgate 1994, pp. 20-21. Similarly, the approximate limit for dry farming irrigation (average 200 mm precipitation) has been marked.

The orographic conditions in Syria, i.e. the physical effect mountains and mountain ranges have on atmospheric patterns (cf. Cech 2005, pp. 43-44), significantly impacts its weather and climate, and has probably had such an effect also in a long-term perspective (Moore et al. 2000, p. 45). Western Syria is characterised by deep valleys and high mountain ranges, occasionally interspersed by gaps, like the Homs Gap, influencing local climates and environments around and behind them (cf. 2.2.1). East of this zone are the Syrian steppes and plains located, where more modest mountain ranges and hills stretch from the southwestern areas around Damascus and northeastward toward and across the Euphrates (Wirth 1971, p. 41). The tallest peaks along this line are found in the southwest, e.g. Qalamun which can reach an altitude of 1914 m, with the profile gradually lowering eastward through the Palmyrene and ending in Jebel Bishri, with a modest height of c. 867 m (Wirth 1971, p. 52, 55; Moore et al. 2000, p. 43). The Palmyrene range[2], which is the main geographical focus of this study, constitutes a large part of this zone (**Figure 2.2**). Continuing across the Euphrates there are isolated mountain ranges in the Syro-Iraqi landscape, most importantly Jebel Abd el-Aziz, peaking at c. 920 m, and Jebel Sinjar, peaking at c. 1480 m (Wirth 1971, p. 41; cf. **Figure 2.1**). These highlands thus separate the Syrian plains in two parts following the main tectonic direction (see above). The plains and plateaus of northern Syria and the Jezire steppe region lies northwest of this line, while southeast of the line, crossing modern state borders into Iraq, Jordan, and Saudi-Arabia, the landscape is generally dominated by dry steppe (Al-Hamad) and desert (*shamiyah*) (Wirth 1971, p. 42). Particularly the western Jezire has in later years been subject to both extensive surveys and intensive studies relating to questions around EBA and MBA populations in this region. This research has commonly focused on notions associated with mobile pastoralism, as well as the consequences these societies suffered or adaptive responses they adopted in light of the deteriorating climatic conditions developing in the last quarter of the 3rd millennium BCE (cf. 2.5) (e.g. Lyonnet 2001; Wossink 2009; 2010).

[2] These mountains are also sometimes collectively known as the Bilas block, Palmyrene massif, or Palmyrids, and should not be confused with the Palmyra range between Damascus and Palmyra (cf. Brew et al. 2001, p. 575, fig. 2, p. 584, fig. 9).

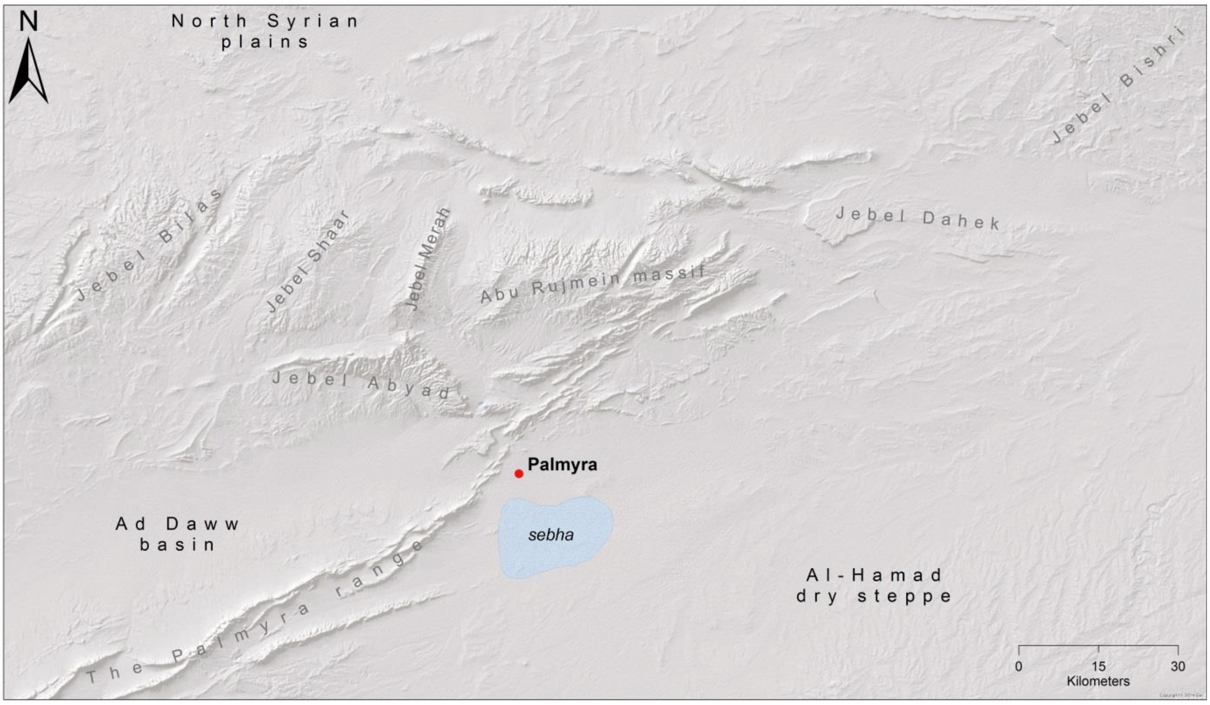



**Figure 2.2:** Physical map of the Palmyrene with its main features and toponyms. Again, the directional pattern of tectonics is quite evident. Note the large *sebha* south of the Palmyra oasis, where much of the Palmyrene precipitation ultimately ends up (cf. **Figure 2.3** and **Figure 2.5**). Details of this landscape is extensively documented in appendices 1-4 and referred to repeatedly in this study, particularly throughout chapter 4. The Palmyrena project focused its efforts in the field in and around Jebel Abyad and Jebel Merah (cf. 4.2.3.1 and 4.2.3.2 – cf. **Figure 4.55** and appendix 2 for concession area).

The Palmyrene mountains (e.g. Jebel Bilas, the Abu Rujmein massif, and Jebel Bishri) are sedimentary in character and mainly built up of limestone, sandstone, chalk, and marl (cf. Brew et al. 2001, p. 584, fig. 9). They can be attributed to Pleistocene uplift, as can the mountains of the Jezire (Jebel Abd el-Aziz and Jebel Sinjar) and the ranges between Damascus and Palmyra (Qalamun and the Palmyra range) (Wirth 1971, p. 44). The Levantine coastal ranges usually have a gentle western slope and a very sheer eastern drop, which can be as much as 1500-1800 m in the case of e.g. Hermon. While the mountains southwest of Palmyra also reach respectable elevations (see above), their height in relation to the surrounding steppe is much more modest, with the latter only lying between 400-800 m below the loftiest peaks. This pattern continues further east with the Jezire ranges, which generally rise between 400 and 900 m above their foothills (Wirth 1971, pp. 51-54).

The Palmyrene topography is dominated by mountain ranges stretching out east from the Homs region – Jebel Shumariye, Jebel Bilas, and the Abu Rujmein massif – and the ones centrally located in the survey area of the Palmyrena project – Jebel Shaar, Jebel Abyad, and Jebel Merah. Some of the latter, such as Jebel Abyad and Jebel Merah have steep profiles with several peaks reaching a height of 1300-1350 m, and incised by deep, canyon-like valleys, while others are better characterised as high, but gentle and broad plateaus, like e.g. Jebel Shaar (Wirth 1971, p. 54). The Palmyrene and the dry steppes and deserts further inland are not particularly affected by tectonic disturbance compared to other Syrian regions further north and west, but the region was somewhat tilted during the Neogene, and this has formed escarpments stretching over long distances (Wirth 1971, p. 46), which also can be discerned vaguely in **Figure 2.2**. Fine sediment deposits found in flat depressions on the central Syrian steppe as well as around both Damascus and Homs can be attributed to large Pleistocene lakes, while the foothills are generally covered by a mantle of climatically-induced erosional debris from the same geological period, not having been cleared away by the last Ice Age as in many other parts of the northern hemisphere (Wirth 1971, pp. 47, 63). Indeed, by far the most powerful dynamic force shaping the Syrian landscape through the ages has been water action, even in areas of minimal precipitation, and this is an erosional process still very much in force today. The steppe and dry steppe show a complex pattern of natural valleys, gullies, wadis, and plains of alluvial origin. Water rushing through such topographical features following a rain shower can significantly alter the landscape on a local level and lead to massive vertical and horizontal erosion and gravel deposits (Wirth 1971, p. 66). As will be shown later in this study (cf. 4.5.4.2 and 4.7.1), the rushing boon of water in the Palmyrene and other arid regions also seems to have been acknowledged and to some degree tamed for exploitation by populations inhabiting such biomes through extensive use of hydrological implementations of various types (e.g. cf. Castel 2008, p. 305; Braemer et al. 1996, pp. 122-123). I will now focus on the basic principles behind these processes in the region – the hydrology.

### 2.1.2 Hydrology

The Syrian steppes are incised by a multitude of small and large perennial and intermittent water courses, the result of a process that has been ongoing throughout the Quaternary. The two largest rivers, the Euphrates and the Orontes, probably stabilised their courses in the early Pleistocene – about two million years ago (Wirth 1971, p. 62). Along the course of the Euphrates valley, which itself can be several kilometres wide, terraces are found that can be from 80 m and up to 250 m in relative height to the river. It is joined on its left (northeastern) bank by its main tributaries, the Balih and the Habur, two other perennial rivers that have cut river valleys through the Jezire. Drainless, shallow karstic depressions where intermittent lakes (*habras*) often are formed after occasional flooding caused by rain showers are also found across the steppes and plains of Syria, particularly in central parts. Between the eastern catchment of the Orontes and that of the Euphrates today, there are many areas with potential for the emergence of drainless pools following wetter periods. At their lowest points end lakes of saline character are formed, but they usually lie dry for most of the year (Wirth 1971, p. 63). Such lakes are called *sebhas* (e.g. Issar & Zohar 2007, p. 18), and one of the larger Syrian examples of a *sebha* is found just south of Palmyra (cf. fig. 2.2), mainly created by precipitation falling in the Palmyrene and draining toward it through Palmyra (**Figure 2.3** and **Figure 2.5**). Another important topographic feature common in the steppe is the *fayda* (albeit a locally applied term, cf. Geyer & Calvet 2001, p. 57), which can be described as an area associated with wadi confluences or widening of valley bottoms where soil accumulates and is naturally irrigated by water runoff. South of Deir ez-Zor on the other hand, such runoff drains from the Al-Hamad dry steppe toward the Euphrates in broad, low wadis (Wirth 1971, p. 57; Moore et al. 2000, pp. 43-44 – also cf. **Figure 2.1**). These wadis originally formed during a time when the region saw much higher precipitation than today, probably prior to the Pleistocene. However, it can be assumed that Near Eastern rivers also during the Pleistocene had significantly higher water levels than they have today. This is also the explanation for the extensively-branched wadi-systems in what today is a barren desert, particularly in southeastern Syria and the northern areas of the Arabian peninsula. Higher inflow and volume of water also created the large inland lakes mentioned above (cf. 2.1.1), in addition to the accumulated effect of lower evaporation rates (Wirth 1971, pp. 62-63; also cf. Moore et al. 2000, p. 44, with references). Although some basins – such as the Aleppo area with the Quweiq river – have perennial inflow, most are periodic or episodic (Wirth 1971, p. 63). The causes behind these unstable hydrological conditions are mainly linked to seasonal patterns and especially due to precipitation regimes, aspects which will be presented in detail below (cf. 2.2).

**Figure 2.3:** Rainwater from the Palmyrene highlands on its way through Palmyra, virtually forming a river of about 30-40 cm depth along the wide street between the Palmyra museum and the Tadmor town blocks. Unfortunately for some, particularly the internet cafés in the basements along the street and the restaurant at the end, the runoff does not stop until it fans out in the *sebha* south of the city.

The rivers and springs are the main sources of water in Syria. The structure of western and central Syrian geology is generally aquiferous, making it ideal for karstic springs. It soaks up precipitation like a sponge and channels the water out to the surface again at certain spots in the form of springs (Wirth 1971, p. 108; Cech 2005, pp. 92-93; cf. Lewin & Woodward 2009, p. 297, fig. 10.8 for a graphic illustration of karstic systems). The largest of these can constitute the main supply for major Syrian rivers, such as Ras el ‘Ain which feeds the Habur and Ain Zerqa feeding the Orontes, and can consequently have a substantial volum of water flow[3]. Smaller springs are also scattered around the dry steppe, providing potential and indeed basis for settlements like Palmyra or Suhne. However, due to the limited amounts of regional precipitation (cf. 2.2.2), these springs have a correspondingly low water output, are subject to seasonal rhythms, and often contain water of poor (sulphuric) quality (Wirth 1971, p. 109;

[3] For instance, Ras el ‘Ain is the 7$^{th}$ largest natural spring in the world, with an output of up to 40 $m^3$ each second (cf. Lewin & Woodward 2009, p. 298, table 10.1).

Lewin & Woodward 2009, pp. 295, 298). Still, for populations utilising arid landscapes like the Palmyrene, knowledge of or control over such water sources can be critical for e.g. purposes of travel and particularly the tending of livestock (cf. 5.1.3 and texts **5.3** and **5.6**). Springs could on the other hand also create adverse conditions in some instances, e.g. those along the western side of the Orontes valley which made this area especially susceptible to swamping and subsequent consequences, like malaria and other diseases, prior to the introduction of industrial pumps (Wirth 1971, p. 109).

Euphrates is by far the largest Syrian river on any scale (average 5000 $m^3$ each second), accounting for just short of 90 % of the water that perennial rivers drain annually. However, its water flow is highly susceptible to precipitation swings in its catchment area, ranging from a minimum of 250 $m^3$ during severe droughts to a maximum of 8500 $m^3$ under catastrophic floods. Habur and Balih, its perennial tributaries, have in comparison only an average output of 50 and 6 $m^3$ respectively, with correspondingly low values of maxima and minima. The Orontes has an average flow of 30 $m^3$ each second, but as it receives most of its water from springs, the water level is much more consistent compared to the river systems further east. However, due to precipitation or lack thereof, it can still seasonally increase to up to 400 $m^3$ or decrease to 10 $m^3$ for short periods of time. Although the Euphrates today has been modified by the construction of several dams – the most important Syrian example being the large Tabqa-dam upstream from Ar-Raqqah, built in the years 1968-73, and consequently forming Lake Assad – it flowed largely unexploited through Turkey, Syria, and Iraq until mid-20$^{th}$ century. Irrigation of the river terraces was an extreme undertaking until the arrival of industrial pumps, meaning that only the floodplain has traditionally be used for agriculture, with from certain possibilities for expansion or intensification by the use of leats or canals (Wirth 1971, pp. 109-110). However, the rise in the Euphrates water level comes in fact too late in the season to be of much use for irrigating a number of crops without massive canals (e.g. Moore et al. 2000, p. 45, with references). Other than these four examples, the Syrian waterways are restricted only to very small or seasonal rivers.

Finally, the use of groundwater by pre-industrial societies in the region was probably only of negligible extent. Apart from special spots in western Syria and in the river terraces, such sources are neither characterised by abundant quantities nor good quality. Especially problematic are high salt concentrations, but also the great depths necessary to reach in order to tap these wells (Wirth 1971, pp. 114-115). While perennial lakes do not occur naturally in

Syria, there are several examples of artificial lakes created by dams in recent history, as well as of certain older lakes, like Lake Qatina, south of Homs, and the lake known to have been near Bronze Age Qatna (Wirth 1971, p. 115; Bonacossi 2007, p. 72). Clearly, precipitation stands out as the key factor in the Syrian hydrological system. I will now turn to this topic, its underlying mechanisms, and its effects on the landscape.

## 2.2 The climates of Syria

The Syrian geomorphology has a major orographic impact on its various environments. Especially the tall Levantine mountain ranges dictate which regions receive ample rainfall and which ones barely get any due to their rain shadow, as the regional meteorology is particularly influenced by Mediterranean patterns, which thus determine the Syrian climate (Moore et al. 2000, p. 45 – cf. 2.2.1). This becomes evident when comparing the Homs plain, which due to the Homs gap receives annually 400-600 mm rain, to Damascus, which lies in the shadow of the Lebanon range and only gets 200-300 mm, even though the Syrian capital lies closer to the coast (cf. **Figure 2.6**). However, climatic conditions are parts of much more complex processes than that. Seasonal variations, the topography, and soil matrixes integrate with each other to form a mosaic of environments, all affecting the natural potential for human habitation – which, as will be shown below (cf. 2.3), also has severely affected the resilience of the Syrian landscapes. In addition to local factors, the eastern Mediterranean cyclonic activity is also influenced by remotely driven processes, like the North Atlantic oscillation (NAO) storm tracks and the intertropical convergence zone (ITCZ) (cf. e.g. Brayshaw et al. 2011, p. 25), both of which will be explained in detail below (cf. 2.4.8).

### 2.2.1 Seasonal patterns

Syria is generally considered to be part of the Mediterranean climatic regime[4], which consequently means it experiences two main seasons – summer and winter – during the year, with arguably mere transitional months in between. These two differ significantly in both temperature and amount of precipitation, but within Syria itself their characteristics can also vary from region to region (Wirth 1971, p. 68). Any study of populations moving across the

[4] Cf. Harding et al. (2009, pp. 69-79), who present a short overview of the Mediterranean climate system, its events and its underlying mechanisms.

landscape according to the seasonal cycle, such as Near Eastern mobile pastoralists, would therefore require a thorough assessment of its timing and horizon of variation (also cf. 5.1.3).

#### *2.2.1.1 Summer*

Summers (approximately June to September) are characterised by a continental climate, particularly in the interior (Moore et al. 2000, p. 44), with minimal cloud cover, which results in little or no precipitation and substantial temperature differences between days and nights due to heat emission (ranging from 35-40° C down to 15-20° C). However, the variation from day to day is also much less marked and temperatures are quite consistently uniform throughout Syria as a whole (Wirth 1971, pp. 76-77; Traboulsi 1991, p. 49). Seasonal weather patterns follow the pressure gradient principle which states that air moves to equalise pressure differences (Cech 2005, p. 45). Specifically for Syrian summers, this is mainly determined by the Indian monsoon system creating a low pressure zone over Arabia due to high surface temperatures. This sucks in continental air from Central Asia, known as *etesian* winds, while a subsidiary depression over Cyprus turns these winds westward so they enter Syria from the southeast, thus explaining the dry, hot character of its summers (cf. Harding et al 2009, p. 73; Moore et al. 2000, p. 45, with references; Wirth 1971, p. 77). Consequently, during this part of the year, any arduous form of mobility outside areas of ample shade and adequate water supplies would have to be considered very hazardous for all participants indeed (e.g. cf. text **5.6**).

#### *2.2.1.2 Winter*

Winter is arguably the most important, but also the most unstable and unpredictable season of the Syrian year, and is characterised by cloud structures and precipitation to varying degrees. It usually lasts from November to March, but the core months are January and February (Wirth 1971, p. 83). Weather patterns are determined by a massive Asian high pressure zone, sometimes with a subsidiary high pressure over Anatolia, drawing in wind and precipitation from cyclonic depressions in the eastern Mediterranean, particularly from the Genoa and Cyprus low-pressure systems (Moore et al. 2000, p. 45, with references; Bryson & Bryson 1997, p. 149; Harding et al. 2009, p. 75, table 3.1; Roberts et al. 2011a, p. 6). However, sometimes cyclones can even travel all the way from their ultimate source, the NAO system (Wirth 1971, p. 83; Harding et al. 2009, pp. 70-71, 73; Roberts et al. 2011a, p. 6). Due to its orography and the fact that winter weather consistently enters Syria from the west, the variation in temperature and precipitation distribution crystallises the country into nearly distinct climatic regions during winter, quite the opposite of the relative uniformity of its summers (Wirth 1971, p. 76). The lower mountain range of Jebel Ansariye with its 1300-1500 m high peaks constitutes less of a rain shadow than the great ranges of Lebanon, Anti-Lebanon, and Hermon further south, ranging from 2000 up to 2800 m above sea level. Combined with the Homs gap this allows moisture and precipitation to reach much further inland into northern Syria and indeed parts of the Palmyrene than is the case for the dry steppe further south (Wirth 1971, p. 71 – cf. **Figure 2.6**). Temperatures are also regionally much more varied during winter, although with less difference between night and day, with frost and snow posing a potential hazard even as late as March, especially in inner Syria (Wirth 1971, p. 82). Particularly cold air can occasionally blow down from the Anatolian plateau, resulting in severe conditions, with examples in historic times of temperatures down to -20° C (1949/50) and -27° C (1911), which consequently partially covered both the Orontes and Euphrates with ice (cf. Wirth 1971, p. 85). Although these are the most extreme instances, frost is a potential risk to vegetation, crops, and flocks every year. For instance, during the winter of 1959, the nomadic and semi-nomadic population of Syria lost nearly all their lambs to the cold, while a combination of drought and frost in the years 1931-33 caused a loss of up to 80 % of the livestock pasturing in the Jezire (Wirth 1971, p. 96, with references).

**Figure 2.4:** A view of Palmyra in spring, after the winter rains have passed and the grasses and herbs have started their annual sprouting from until then dormant seeds (compare with e.g. **Figure 2.5**, a photography taken during a rainstorm). The still water-filled *sebha* south of the town can also be discerned behind the oasis. This evocative photo – albeit undated, but probably from the 1970s or 1980s – is taken from the hill behind the Diocletian Camp and kindly made available for this dissertation by the German team in Palmyra led by Andreas Schmidt-Colinet.

#### *2.2.1.3 Seasons of transition*

Autumn and spring are transitional seasons. Autumns (approximately late September and October) may see overcast skies and rain-bearing clouds, but the rain often evaporates before it reaches the ground (called *virga*, cf. Cech 2005, p. 25). There is usually a two or three week lag in the appearance of autumn from the coastal regions to the hinterland (Wirth 1971, p. 79). April and the first half of May is considered to be the Syrian spring, with a considerable reduction in the number of rainy days. However, rising temperatures can often result in thunderstorms and accompanying dust storms in the interior (Wirth 1971, p. 87). During both autumn and spring the occurrence of *samum* or *hamsin*, i.e. southwesterly storms from the

Sahara is not uncommon. These events are characterised by sudden increases in temperature as well as obscuring conditions due to massive amounts of sand and dust in the air, and can be dangerous for both people and animals taken unawares (Wirth 1971, p. 85; Moore et al. 2000, p. 46; Harding et al. 2009, p. 77-78, table 3.2 – also cf. **Figure 5.4**). In short, these are the overlying mechanisms and patterns of the Syrian seasonal cycle. They are important for a basic understanding of how climate and precipitation interplay with the landscape to form the various environments and biomes across Syria, aspects which will follow below. Additionally and more directly associated with the main questions this study aims to address, it is essential to understand such seasonal patterns to consider the impact they have had on traditional Near Eastern societies, and on mobile groups in particular (cf. 5.1.3 and 5.2.1).

### 2.2.2 Precipitation regimes

The reason winter could be regarded as the most important season for Syria, is because precipitation *is* the vital factor for its environments. Precipitation distribution defines the climatic regions, and the amount of rain fluctuates to a much larger degree than e.g. the temperature, thus giving winter its unstable and uncertain character. Hydrological considerations are also largely based on precipitation patterns, and thus land use and potential follows as well (Wirth 1971, p. 88). The minimum average amount of rain needed to grow barley, a relatively hardy crop, without irrigation (i.e. dry-farming) is c. 200 mm annually, as long as the soil has sufficient depth. For wheat this limit increases to 250 mm, while tree crops need much more – an average long-term precipitation of about 400 mm (Wirth 1971, p. 91). In addition, temperature, evaporation rates, and soil matrix can also affect the biome potential for cultivation.

**Figure 2.5:** Flooding in Palmyra following a heavy thunderstorm and rainfall in the region taking place during the spring of 2011. Most of the water ending up in the streets has in fact drained from the Palmyrene highlands. The Palmyra museum is in the bottom left of the picture, behind the palms and pines in its garden, and the view overlooks the Roman and Byzantine ruins (photo: Torbjørn Preus Schou, 2011).

The amount of precipitation decreases strongly from west to east in Syria, although there are notable exceptions such as the north and the Palmyrene highlands (cf. **Figure 2.6**). During the core winter months there is always some degree of precipitation, even in dry years, but December and March can prove more uncertain in this respect (Wirth 1971, pp. 80-83, 91; Traboulsi 2010, p. 94). While the quantity of rain can fluctuate on a year-by-year basis, years of similar character often come in bundles of 5-6 years at the time in a long-term perspective, i.e. dry or wet years occur together. However, the rhythm of such clusters themselves does not seem to be markedly consistent (Traboulsi 1991, p. 54). This pattern has in fact led to instances of failed investments, as e.g. when Syrian entrepreneurs initiated agricultural ventures in the dry steppe after many years of decent rainfall, only to be foiled by catastrophic crop failures in the drought years of the late 1950s (Wirth 1971, p. 97; Moore 2000, p. 47). During droughts the regional isohyets can get shifted so the normal 400 mm average boundary becomes a 250 mm line (cf. **Figure 2.6**). Data from measurements across Syria show a significant degree of local variation in precipitation, and two meteorological stations found in relative proximity to each other can actually receive very different amounts of rainfall (Wirth 1971, p. 91). Such variable conditions can be especially unfavourable for agriculture (Traboulsi 1991, p. 51). However, by and large it seems to be the case that a dry year in Aleppo also corresponds to a dry year in Deir ez-Zor, thus most of Syria is affected by similar weather patterns (cf. Moore et al. 2000, p. 48, fig. 3.5). On the other hand, Traboulsi (2010, p. 94) investigated average rainfall from stations across Syria, and concluded that apart from in the most severe instances, droughts actually do not necessarily affect the whole country at the same time, but are generally localised to specific regions, while in an earlier study (cf. Traboulsi 1991, p. 54) she argued that so-called wet years are in fact rather characterised by more days of rain than more rain per shower. There is seemingly some ambiguity to this aspect, but one explanation may be that some areas or landscapes are more sensitive to fluctuations in the weather, resulting in a more severe response compared to other areas to the same general annual pattern, and thus seem to be more negatively affected. Perhaps there also is a certain climatic effect of the seasonal lag experienced from west to east (cf. 2.2.1), although this is just speculation. However, the occurrence of wet vs. dry years does have a marked effect on the steppes and desert biomes of Syria (cf. 2.3), as in wet years the dry steppe can extend into otherwise desert areas of normal years, but vice versa during droughts (Traboulsi 1991, p. 49).

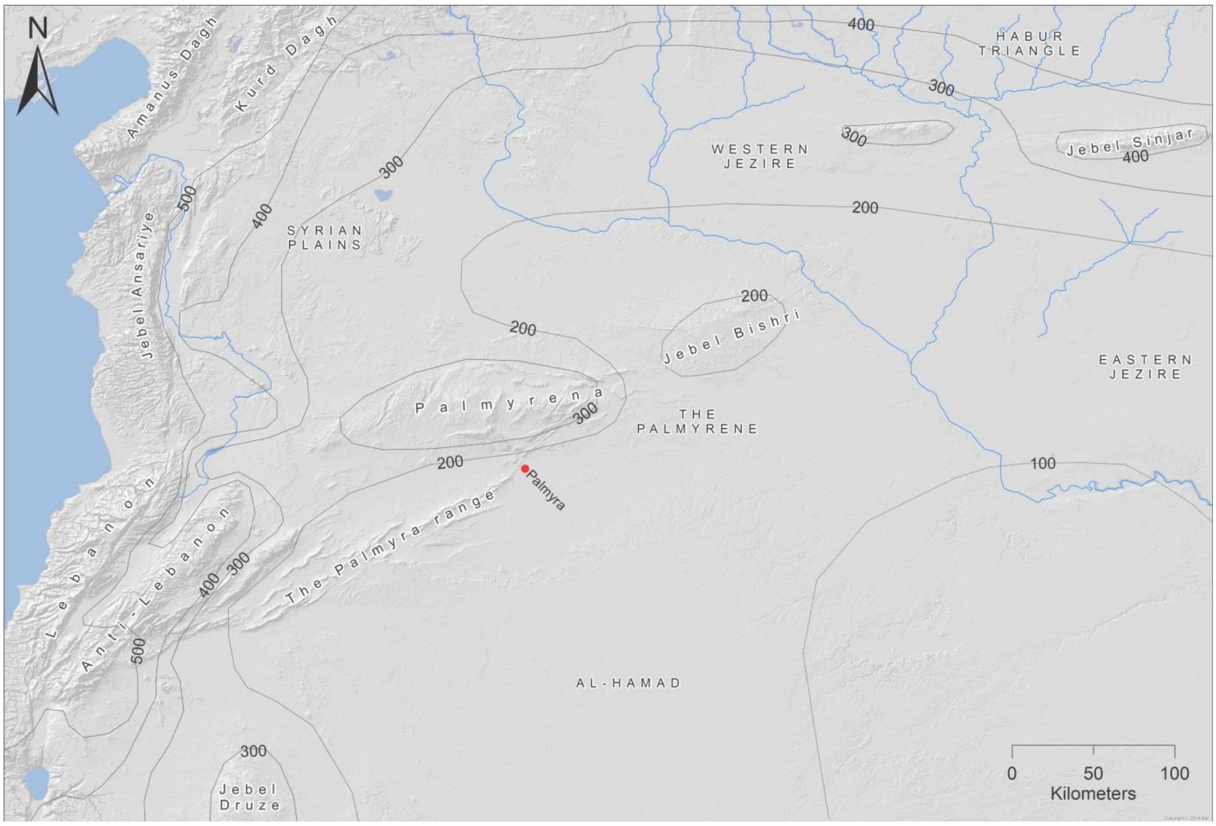



**Figure 2.6:** Broad strokes of the modern Syrian long-term average isohyets based on Wirth (1971, karte 3), Moore et al. (2000, p. 46, fig. 3.3), and Fiorentino et al. (2008, p. 52, fig. 1). Of course, these patterns are subject to year variations, where e.g. a drought year can make the 400 mm limit into a 250 mm limit.

### 2.2.3 Climatic regions

Syria can be divided into four overarching climatic regions, with each usually divided into subtypes (cf. Wirth 1971, pp. 100-106, fig. 22). The main factors defining them are again amounts of precipitation integrated with regional geomorphology, which form the basis of a number of distinct biomes.

#### *2.2.3.1 Mediterranean climates*

The most fertile parts of Syria are characterised by a Mediterranean climate, either a coastal or a drier type. Common for these are abundant rainfall and low chance of frost, making the risk of crop failures insignificant, also in drought years. Even the dry Mediterranean climate receives enough precipitation to grow crops of wheat and various arboricultural plants – unless exceptional droughts occur. The coastal Mediterranean climate normally never experiences temperatures below the freezing point, although frost can pose a miniscule risk in drier parts located over 400 m above the sea (Wirth 1971, p. 102). Closely related to these two types is the Mediterranean steppe climate, differentiated into a western and a northeastern Syrian subdivision. They are in many ways similar to each other and share some continental features the true Mediterranean climates lack, such as warm winds from Anatolia during summer and a slightly lower precipitation average (Wirth 1971, p. 103).

#### *2.2.3.2 Dry steppe climates*

Arguably, the most relevant climatic region for this study is the dry steppe climate, which encompasses the dry steppe and desert subclimates. The entire Palmyrene and the Jezire are both securely defined within the former subtype, while southern parts of the Al-Hamad and e.g. the plateau along the right (southwestern) bank of the Euphrates downstream from Mari is considered to be desert climate. The dry steppe climate is characterised by limited precipitation (c. 120-220 mm annually), and has actually been called a temperate desert caused by orographic and meteorological conditions (cf. Traboulsi 1991, pp. 48, 54). Crops can only grow in wet years, or in areas where the soil structure, topography, or hydrology increase the local potential for cultivation (Wirth 1971, p. 105). However, the rain showers of the winter season provide excellent pastures for mobile pastoralists (cf. **Figure 2.20**), whose societies dominate landscapes defined under the dry steppe climatic regime during that part of the year (cf. 5.1.3). The desert on the other hand receives on average less than 120 mm rain annually, making it virtually uninhabitable for societies practicing traditional modes of subsistence, and is often avoided even by fully nomadic populations herding camels (Wirth 1971, p. 105).

#### *2.2.3.3 Montane climates*

Finally, Syria also has some alpine mountains, i.e. the Levantine ranges running north-south along the Mediterranean coast (cf. **Figure 2.1**). The climatic subdivisions within this region are the oceanic (the ranges facing the Mediterranean) and the continental (the ones facing eastward) types. The latter type can be likened to the Palmyrene ranges, in that they both have comparable average temperatures and receive much less precipitation than the oceanic alpine mountains (Wirth 1971, pp. 105-106). The Palmyrene should still be defined as within the dry steppe climate and the alpine climates are thus not of particular importance for this study. This rough division of Syria into climatic zones provides a framework for investigating the current or recent patterns of vegetation and animal life in the region. However, this is not straightforward, as the Syrian environments experienced today in fact seem to be a consequence of dramatic alterations of the landscape, exacerbated by subsequent soil erosion.

## 2.3 The current state of Syrian biomes

### 2.3.1 Considerations on soils and erosion

Regardless of climate and geology, the ecological basis for natural vegetation and fauna in Syria has deteriorated massively since antiquity. The Dead Cities of northwestern Syria can attest to this, as in Roman-Byzantine times the area had at least a 70-100 cm thick layer of soil, but now is merely a barren and eroded landscape (Wirth 1971, p. 115). Although the climate during the Byzantine period may have been more favourable than it is today (cf. Geyer & Rousset 2001, pp. 112-113), climate change cannot be argued to constitute the main cause of this substantial alteration. Rather, it seems to have been all but destroyed by centuries of human intervention and exploitation, a rate that increased exponentially in industrial times with the introduction of modern devices in the past 100 years (Wirth 1971, p. 98).

Soils, which largely influence land use potential, are variable across the country. They can be classified into three distinct types – Mediterranean, steppe, and desert soils (cf. Moore 2000, pp. 47-49, with references). The Palmyrene generally adheres to the desert type, incorporating wind-polished flints and deposits weathered by perpetual wind erosion (Moore et al. 2000, p. 49). Regional variations often follow precipitation patterns, as more moisture both weathers rock into finer soil and create conditions in which humus more easily forms (Wirth 1971, pp. 114-115). Also, deeper soil can contain more water from rainfall than can soils with low absorption. Only in the Habur triangle does both climate and soil come together in the most favourable way (Wirth 1971, p. 116), a region which in fact also seems to have been extensively settled during much of the EBA and MBA (Wossink 2009, pp. 144-145 - cf. 3.3 and 3.4). However, these factors are of minor consequence for the natural environment compared to the human impact on the landscape. The vegetation in all climatic zones seems to have been razed in some form or another, and fauna has likewise disappeared across the region – either caused indirectly, as a result of the environmental degradation, or directly, through excessive hunting, or both. I will summarise in short the main consequences for each zone to form a basis on which the potential ancient biomes can be compared.

### 2.3.2 Syrian forests and woodlands

The destruction of the original forests and woods of Syria is the most striking example of its degraded landscapes. In both ancient and more recent historical sources, the western part of the country is described as covered by a dense, near impenetrable timber forest, which thinned out toward the east. While some areas may have been depleted in antiquity (e.g Jebel Zawiye between Ebla and the Orontes), others survived in relatively good condition until the 19th century CE, such as Kurd Dagh. Certain isolated and meager remnants still exist, but they seem to be doomed without new tree growth. The main problem is a lack of undergrowth, which is essential for the microclimate on the forest floor and lowers the threshold for soil erosion (Wirth 1971, p. 120; Wainwright 2009, p. 183 – also cf. 2.3.4). A healthy microclimate also protects plant species more sensitive to drought and heat, which cannot root properly if the undergrowth disappears (Wirth 1971, p. 127, with references). Originally, these forests would have contained tree species like oak (*Quercus*), pine (*Pinus*), cedar (*Cedrus*), maple (*Acer*), and olive (*Olea*) depending on the area, but commercial, industrial, agricultural, and domestic utilisation and exploitation has made them mostly barren and karstic landscapes. Particularly proximity to heavily populated areas would have constituted a major factor in this respect[5] (Wirth 1971, pp. 128-129). However, travel accounts from the 19th century CE still told of large tracts of dense oak and maple forests in many areas, so modern developments must have taken a massive toll (Wirth 1971, p. 124; also cf. 2.7).

### 2.3.3 Vegetation in the river valleys

All the major river valleys in Syria are now tilled and cultivated with most of the original riverine forests along their banks having disappeared (cf. Wirth 1971, pp. 134-135). However, certain areas along the Orontes and Euphrates can still retain small groves or patches of forest, especially on flooded islands or around oxbow lakes. In the Orontes valley these can harbour sycamore fig trees (*Ficus sycomorus*), poplars (*Populus*), willows (*Salix*), and alders (*Alnus*), while in the Euphrates valley they can contain specific types of the Euphrates poplar (*Populus euphratica*) and willows (*Salix acmophylla*), with a potentially thriving undergrowth of tamarisk (*Tamarix tigrensis*). Finally, wetlands and swamps with rushes, reeds, sedges, and water lilies were also until recently a common and integrated part of the riverine biomes of

[5] This seems to be a probable explanation for the early deforestation of Jebel Zawiye, i.e. proximity to Ebla, Idlib, Hama, the Orontes valley, and generally a relatively well-populated part of Syria throughout the ages.

Syria, although now nearly all have been drained and converted into arable land - and thereby been removed from the landscape (Wirth 1971, p. 135).

**Figure 2.7:** Example of an ecological hot-spot found in the Jebel Abyad mountain range, i.e. an outlet of water stored in the aquifer geology of the Palmyrene, providing favourable conditions for vegetation and animals, albeit highly localised.

### 2.3.4 Steppe, dry steppe, and desert landscapes

In many ways, the degradation of the forests parallels the development in the Syrian steppelands, dry steppes, and deserts. The original vegetation was not as dense as in areas of true forests or woodland (cf. categories in **Figure 2.18**), but was nevertheless significantly richer and more extensive than it is today – both for arboreal forms and for grasses and shrubs. On the whole, many of the steppe biomes would have been like parklands, with trees scattered across the landscape to various degrees, with denser groves thriving in more favourable locations, such as dells or valleys. The dry steppe was likewise home to tall grasses and somewhat thinner tree cover than the moister steppelands, at least in less than optimal zones (Wirth 1971, pp. 120-121, with references). However, these parklands have all but disappeared, succumbing to human needs for firewood, building material, and other domestic and industrial uses, while herds of domestic animals have subsequently grazed and browsed away the increasingly vulnerable undergrowth, severely exacerbating soil erosion and surface water runoff (e.g. Kouchoukos 1998, pp. 356-358; also cf. Cech 2005, p. 30). These processes have not just resulted in a more barren landscape, but also a very different composition of species than the original steppes and dry steppes would have been comprised of. Even the driest parts of southeastern Syria have been considerably altered in character, and are now described as a *"man-made desert"* (Wirth 1971, pp. 120-121 – also cf. 2.6.2 and **Figure 2.17**). Originally it would have been covered by grasses, herbs, shrubs, and even some woody plants and a few trees in ecological hot-spots (**Figure 2.7**). Again, human exploitation and animal fodder selection have totally changed the composition of species, where e.g. non-edible plants have increasingly supplanted other types (Wirth 1971, pp. 120-121, 131).

Key species of vegetation in the original Palmyrene landscape (cf. 2.7.1, 2.7.2, and 2.7.3) would have included trees of pistachio (*P. atlantica, P. terebinthus*), juniper (*J. excelsa*), buckthorn (*R. palestinus*), as well as species of almond (*P. prunus, P. amygdalus*), pear trees (*Pyrus*), and hawthorns (*Crataegus*), while types of grass would have been comprised of *Stipa*, *Agropyron*, and *Festuca* species (Wirth 1971, p. 130, with references). Thus, the region would in the past probably have looked quite similar to undisturbed parts of the Abu Rujmein reservation just east of the Palmyrena project concession area (cf. **Figure 4.21** and **Figure 4.55**, area D), or like the northern and western slopes of Jebel Abd el-Aziz, where terebinth and almond trees are still scattered on the hillsides (Wirth 1971, p. 131; Kouchoukos 1998, pp. 356-361; also cf. Moore et al. 2000, p. 61, fig. 3.10). However, by and large the Syrian steppelands and dry steppes have gone the way of its forests and woods, and in doing so the landscape has been altered to a large degree. The archaeological structures recorded in vast numbers in the Palmyrene (cf. 4.5 and **Figure 4.23**) are therefore most likely very much detached from the environmental contexts in which they were originally constructed, masking the ecological and economic potential for populations inhabiting or using the region. I will now turn to the second part of this chapter – i.e. ancient landscapes – in an effort to reconstruct these contexts, starting with climatic developments in the later Holocene.

## 2.4 Sources for climatic conditions in the past

The landscapes of Syria probably looked rather different in the past than it does today, but it is also clear that the climate itself has fluctuated significantly throughout the Holocene

(Moore et al. 2000, p. 45). Furthermore, there is an increasing amount of data on the development of the regional climate particularly relating to the EBA and MBA, providing empiricism for a reconstruction of relevant environments and biomes, and a contextual backdrop for the topics dealt with in this study. While analyses are available and usually presented in their respective studies on a Holocene scale, I will mainly extract data for the period c. 2400-1700 BCE, although in some instances also project the interval somewhat further back to show how climatic oscillations characterised the 3rd millennium BCE and their nature just prior to the period in focus here. Issar and Zohar (2007, p. 37) argued that an interdisciplinary and holistic approach would be necessary for understanding the interplay between human societies and their environmental context in a diachronic perspective, a notion which I also support. It seems clear to me that climate, environments, and societies often are closely integrated with each other, or at least that environment and society interact under an overarching influence of the climatic regime.

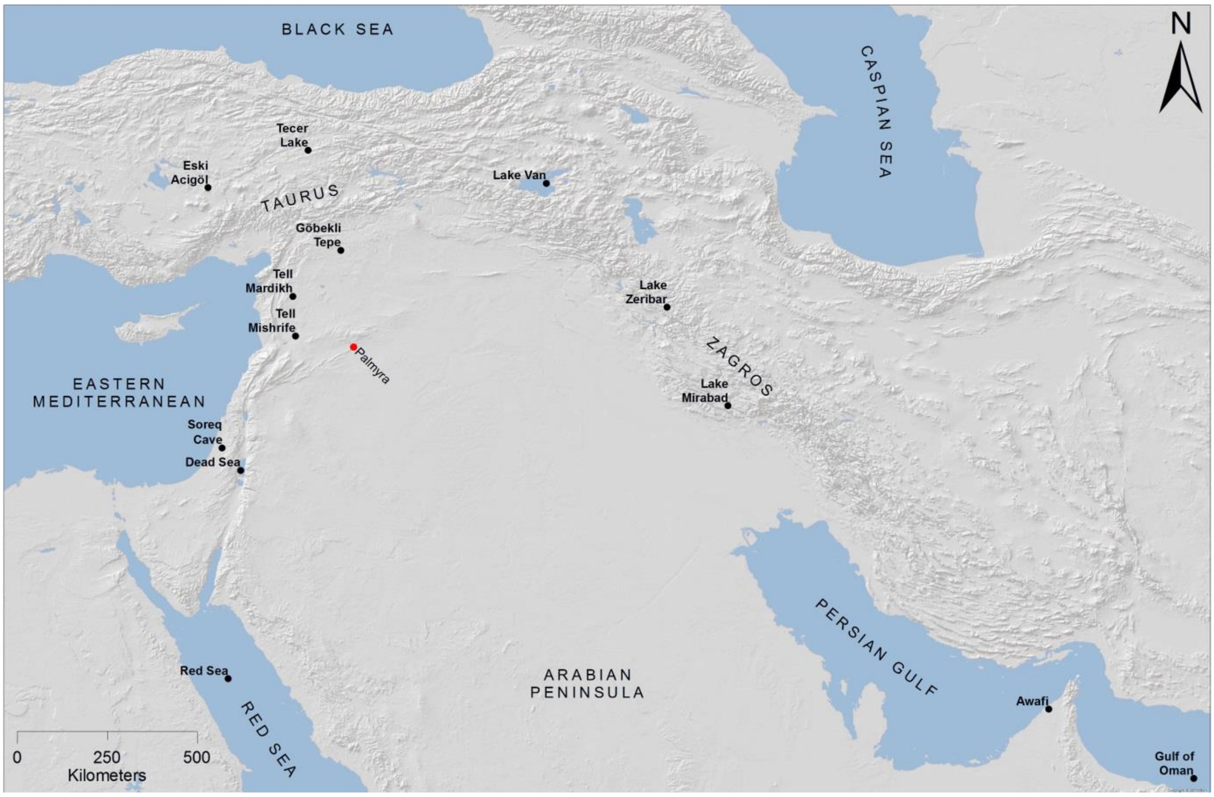



**Figure 2.8:** Sources for proxy data records in the extended Near Eastern region presented and analysed here. They are unfortunately mainly located on the perimeter of the region, but do in general provide a consistent picture of climatic developments through the Holocene.

### 2.4.1 Considerations regarding proxy data use

Any climate reconstruction involving archaeology must be careful not to fall into the trap of circular argumentation. It is easy to hypothesise that changes in the environment have been caused by societal responses interpreted from archaeological data, but such deduction is not necessarily viable. Fortunately, recent years has seen a surge of integration of archaeological research with Holocene climatic developments in Near Eastern contexts (e.g. Issar & Zohar 2007; Wossink 2009; Roberts et al. 2011a; 2011b). Armed with evidence based on analyses of paleosediment accumulations that has been on-going for some decades at sites like Soreq Cave, Lake Van, Tecer Lake, the Dead Sea, and the Gulf of Oman (**Figure 2.8**) archaeologists have been provided with a clearer picture of climatic variations and subsequent environmental consequences in the region in antiquity. However, no such data or have analyses as of yet been carried out specifically for the Palmyrene, and the reconstruction here would thus have to rely on data from other parts of the Near East. With some degree of caution the climatic developments – particularly when coinciding in several studies – could be projected with broad strokes to the region as a whole, since it today forms part of the same meteorological system (cf. 2.2). Lake-levels, lake isotopes, cave speleothems, and deep sea cores are all proxy sources, which can be compared with response data like changes in vegetation compositions and evident hydrological or geomorphological effects of change (Roberts et al 2011a, pp. 3-4 – also cf. 2.6.2). The lakes along the Near Eastern rim are particularly sensitive to environmental changes, reflected by variations in their water levels, salinity, and isotope compositions (Roberts et al 2011b, p. 148 – cf. 2.4.3, 2.4.4, and 2.4.5). I will below present some of the proxy sources forming basis for climatic reconstructions, although far from exhaustive, due as mentioned to the massive increase in intensity of paleoclimatic studies during the last decade.

Proxy data sources are considered to be accurate sources regarding research on past climatic conditions as they are results of formation processes such as sedimentation and can include chemical data such as element isotopes, although results would always be subject to the interpretation of the researcher during the analytical process. However, proxies provide primary information in contrast to response data (cf. 2.6 and 2.7), which are secondary sources and reflect the consequences of a given climatic context. At this point in this investigation the focus is widened to include the entire EBA period as well as the MBA (i.e. 3000-1700 BCE), because in my view a keyhole perspective would not be a fruitful approach in a study of such long-term processes as the interplay between climate, environment, and human societies in a diachronic perspective. Rather, to understand the influence of climatic developments on Near Eastern societies from EBA IV to MBA, it seems more prudent to take a step back and look at the larger picture. For instance, it is possible that favourable conditions in mid-3rd millennium BCE created a basis for socioeconomic structures which in turn had an inherent potential for instability if those conditions deteriorated (cf. 2.5). I will below present the main proxy sources separately – both in terms of data and results – as well as a small number of auxiliary sources (cf. 2.4.7) to further reinforce the picture. Finally, I intend to look briefly at the mechanisms influencing climatic oscillations in the Near East. In this section of the chapter I will employ the chronological term *ka* to denote *thousand years*.

### 2.4.2 Soreq Cave

Soreq Cave has provided the most important climate record in the Near East, as it is influenced by both European, African, and Asian climate systems, located about 30 km west of Jerusalem, Israel, at the interjection of these (Bar-Matthews et al. 1997; Wossink 2009, p. 17 - cf. **Figure 2.8**). Its Near Eastern context also makes Soreq Cave important for Quaternary studies, as the growth of deposits has not been hindered or eradicated by glacial and interglacial intervals (Bar-Matthews & Ayalon 2011, p. 163). It is a karstic cave in which speleothems – mainly stalactites and stalagmites – are formed by rainwater percolating into the cave. Isotope ratios of uranium and strontium, as well as variations in $\delta^{13}C$ and $\delta^{18}O$ values in these deposits, have been analysed since the discovery of the cave in the 1970s and dated by $^{230}U/^{234}Th$ dating. The method has provided absolute dates and a continuous record for the last 250 ka in the region (Bar-Matthews et al. 1997; Bar-Matthews & Ayalon 2011). Recent research has in fact been able to investigate the climatic developments down to a resolution of between 0.8-7.0 years on one stalagmite dated 7.0-5.4 ka BP, and a resolution of c. 20 years on a stalactite dated 5.4-4.0 ka BP (Bar-Matthews & Ayalon 2011, p. 164). The $\delta^{18}O$ values in Soreq Cave are linked to either moist (low values) or dry (high values) periods (Bar-Matthews et al. 1997, p. 161). Variations in $\delta^{13}C$ values originate from $CO_2$ derived from local plants and picked up by the rainwater passing through the ground. Such plants can be divided into types $C_3$, preferring moister conditions, and $C_4$, thriving in more arid conditions, and their sensitivity to environmental conditions make them ideal as paleoclimatic indicators (Goodfriend 1999, p. 503). High $\delta^{13}C$ values indicate a predominant presence of type $C_4$ plants, while low values are indicative of type $C_3$ plants, thus by inference indicating dry or moist conditions respectively (cf. Goodfriend 1999, p. 503; Wossink 2009, p. 17). While this latter method should more precisely be considered as a response variable than direct proxy data, it is included here due to its site association. Both processes have been used to track diachronic changes in temperature and/or rainfall affecting Soreq Cave and reconstruct a climatic representation of the area. However, it is important to keep in mind that there is a certain potential for error in the fact that barring direct observation it is possible that the natural processes involved may have operated slightly differently, in addition to the role human interference in the local surroundings may have played (Wossink 2009, p. 17; cf. Goodfriend 1999, p. 510).

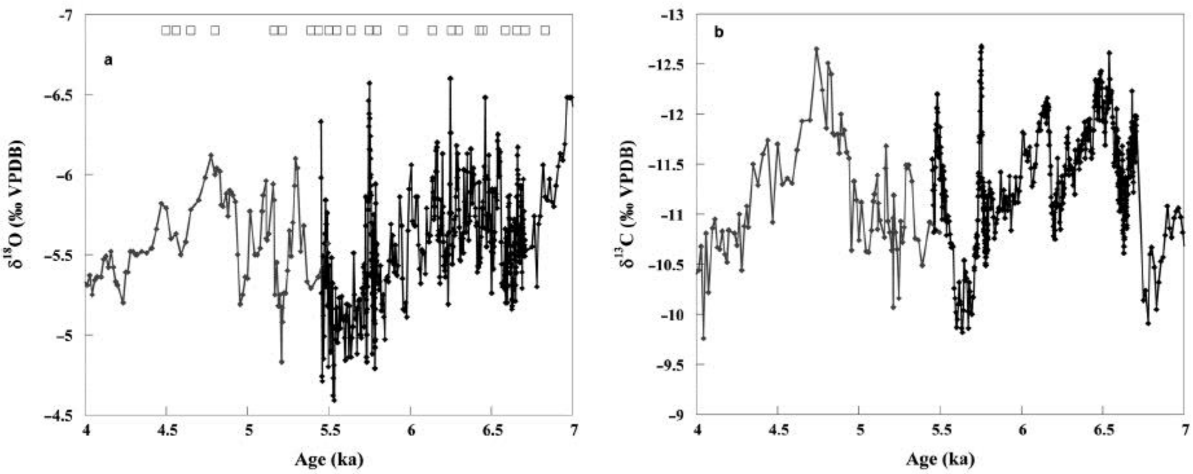



**Figure 2.9:** The Soreq Cave record for the period between 7.0 and 4.0 ka BP expressed as a graphic function of $\delta^{18}O$ (left) and $\delta^{13}C$ (right). While the chronological resolution after 5.4 ka BP and thus the EBA is slightly lower than that of previous periods, both these proxy sources show a clear downward trend through the 3rd millennium BCE, but with notable localised zeniths (c. 4.8 ka and c. 4.5 ka BP) and nadirs (c. 4.7 ka and c. 4.2 ka BP) - the latter ending in a low not experienced since the mid-late Chalcolithic (after Bar-Matthews & Ayalon 2011, p. 166, fig. 2).

Results from Soreq Cave (cf. Bar-Matthews et al 1997; Bar-Matthews & Ayalon 2011 – cf. **Figure 2.9**) inferred from these isotope values attest to a fluctuating pattern of highs and lows on a long-term scale (from c. 7.0 ka BP). The zeniths and nadirs probably reflect shorter-lived events (c. 20-100 years each), but importantly they can generally be identified in the analyses and plots of both values. From c. 5.0 ka BP this pattern of oscillations follows an increasingly downward trend, clearly ascertainable in the graphs (cf. Bar-Matthews & Ayalon 2011, pp. 166-167, fig. 2a, fig. 2b, fig. 4a – **Figure 2.9**). Bar-Matthews and Ayalon (2011, p. 166) identified particular high isotope value ($\delta^{18}O/\delta^{13}C$ respectively) events corresponding to dry periods at 5250-5170 (-4.8 ‰/-10.1 ‰) and 4200-4050 years BP (-5.2 ‰/-9.8 ‰), and a low value event corresponding to a moist period at 4800-4700 years BP (-6.1 ‰/-12.6 ‰) – i.e. attesting to severe changes from mid-3rd to late 3rd millennium BCE. Similar developments were also suggested by Wossink (2009, p. 17), and in his analysis of the 3rd millennium BCE climate trend at Soreq Cave, he emphasised the extreme fluctuations of the millennium and identified a wet period c. 2600-2200 BCE followed by a strong arid trend c. 2200-1800 BCE. Considering these data with the regard to the actual effect such values would have entailed in the modern climatic regime, Bar-Matthews and Ayalon (2011, p. 167) suggested that a decrease in $\delta^{18}O$ of 1.0 ‰ is equivalent to an increase in annual precipitation by about 250 mm, and with other factors like sea-level and temperature being approximately similar – which climatic evidence indicate they were – this equivalence can more or less be applied to mid-Holocene conditions. Orland et al. (2009, p. 29) actually put this equivalence at c. 280 mm per 1.0 ‰ variation. In short, according to recent climatic research, the difference between the moist phase starting at c. 4.8 ka BP (-6.1 ‰) and the arid phase starting c. 4.2 ka BP (-5.2 ‰) would have been 0.9 ‰, and correspond to drop in annual rainfall at Soreq Cave of c. 250-280 mm, which indeed would be rather severe. Presently, the annual precipitation at Soreq Cave is between 500 and 600 mm (Orland et al 2009, p. 29), where c. 500 mm corresponds to a $\delta^{18}O$ value of c. -5.2 ‰ – the same value as that found at c. 4.2 ka BP (Bar-Matthews & Ayalon 2011, p. 167). Due to the $\delta^{13}C$ values being in the lower region (-9.8 ‰ to -12.6 ‰), the local vegetation was seemingly dominated by $C_3$ plants throughout the period, suggesting that the fluctuating isotope values are related to climatic oscillations and not human activity, strengthening the argument that this site and its associated methods is a robust climate proxy and a good representation of actual conditions in the area (Bar-Matthews & Ayalon 2011, p. 168).

### 2.4.3 The Dead Sea

The Dead Sea, situated on the border between Israel and Jordan (cf. **Figure 2.8**), is a terminal lake fed mainly by the Jordan River, as well as by certain wadis. It also receives a small amount of precipitation, but this is minimal as its catchment today only receives c. 50-100 mm rain per year. Due to its terminal nature, the Dead Sea contains brine which is nearly saturated with salt and gypsum (Frumkin et al. 2001, p. 1179; Migowski et al. 2006, p. 422). Following a drop in water levels during the 1960s as a consequence of massive water diversion for agriculture and other uses, records of Holocene sediments were exposed in fan-deltas of the lake (Enzel et al. 2003, p. 264). These Dead Sea proxy records relate either to fluctuations in water levels or to salt deposition and sediment composition, both of which can directly be correlated with the amount of rainfall in its catchment area and evaporation levels due to temperature and humidity (Frumkin et al 2001, p. 1182, fig. 2; Wossink 2009, p. 18). Chronology for water level deposits has usually been provided by $^{14}C$ dating of organic matter, such as driftwood, deposited after floating on the surface (Frumkin et al 2001, p. 1181; Issar & Zohar 2007, p. 25). Varve counting under microscopic examination of sediment cores has also been used as an alternative method for chronological control, as well as providing a supplementary approach to paleoclimatic reconstruction through mineralogical analyses (Migowski et al. 2006, p. 424). The precipitation included in the Dead Sea hydrological system is mostly determined by eastern Mediterranean maritime cyclonic activity (Enzel et al 2003, pp. 267-268 – also cf. 2.2.1). Enzel et al. (2003, p. 272) evaluated the geological, meteorological, and hydrological data and concluded that the sensitivity of this system makes it likely to have experienced similar effects in the past to that it experiences under modern atmospheric conditions. The main drawback with climatic records extrapolated from lake level fluctuations is that it only attest environmental extremes, while intermediate levels ultimately get obliterated by the rising and falling water (Issar & Zohar 2007, p. 26).

The Dead Sea proxy records have been analysed in a number of recent studies, e.g. Enzel et al. (2003), Migowski et al. (2006) and Frumkin (2009). Enzel et al. (2003, p. 264) argued that the water levels after c. 4.0 ka BP have overall been lower than earlier in the Holocene. According to their study (cf. Enzel et al. 2003, p. 265, fig. 2B), it has fluctuated repeatedly between -390 and -420 m since then. Although the data resolution for the period prior to c. 2000 BCE is much lower than for subsequent periods, there is a definite and massive drop occurring in the last 400 years of the 3rd millennium BCE. Enzel et al. (2003, p. 268) noted that it in fact constitutes the largest continuous reduction in water levels found in their analyses, being a drop of about 45 m starting at 4.3-4.2 ka BP and reaching a minimum around 3.4 ka BP. Based on their results from core analyses, Migowski et al. (2006, p. 426) on the other hand suggested that the period c. 5.4-3.5 ka BP was actually characterised by rising water levels, and thus moist conditions in the region, which they supported by $\delta^{13}C$ values measured in land snail shells from the northern Negev desert (cf. Goodfriend 1999). However, they did note a shorter interlude of more arid climate, beginning at c. 4.2 ka BP and lasting around 300 years, followed by a return to moister conditions. The late-Holocene climatic deterioration leading to the modern low Dead Sea levels started in mid-2nd millennium BCE according to their conclusions (Migowski et al. 2006, p. 426). Thus, while these studies disagree somewhat on overarching climatic developments in the Near East relating to Dead Sea water levels in the 2nd millennium BCE, the both generally correspond to each other in terms of the late 3rd millennium BCE and its severe dry event. Chronology can unfortunately be rather problematic when it comes to $^{14}C$ dating of organic matter from Dead Sea cores, as dates could be off by centuries due to exposure and contamination from later water levels. Similarly, the dating of driftwood using the same method also carries certain drawbacks, e.g. a time lag between the living tree and the deposition of its wood which potentially could lead to errors of 100-200 years (Frumkin 2009, p. 320). However, dendrochronology has been proven as a reasonably accurate dating method. This was carried out on an exceptionally well-preserved *Tamarix* subfossil from Mount Sedom on the south shore of the Dead Sea, and the results attested that it lived between c. 2265 and 1930 BCE, thus spanning the conventional EBA-MBA transition (Frumkin 2009, pp. 321-322). Measurements of $\delta^{13}C$ values indicated that it experienced a downward drying trend throughout its existence, with notably an intense arid event c. 2020 BCE and a longer drought beginning about 1980 BCE that finally killed the *Tamarix* some decades later. This development was supported by measurements of $\delta^{15}N$ values which was comparable to modern ones – i.e. a hyper-arid environment – with the story emerging again being one of progressive deterioration of the climate throughout the life-span of the *Tamarix*, starting at conditions wetter than today, but ending at even drier conditions (Frumkin 2009, p. 324). If the correlation between precipitation and $\delta^{13}C$ values in the past is similar to the current one, Mount Sedom experienced climatic deterioration in the period c. 1980-1880 BCE, going from about twice the modern amount of average annual rainfall down to approximately the modern regime (Frumkin 2009, p. 325-326). There seem to be certain chronological ambiguities in the results presented above, but a pattern of climatic deterioration in late 3rd millennium BCE is attested in all studies. It may have started slightly earlier or later than c. 4.2 ka BP, and may have continued into the conventional MBA – even possibly returning to slightly moister conditions again for a short time – but the significant difference between the mid-3rd millennium BCE climate and later ones seems also discernable in the Dead Sea record.

### 2.4.4 Lake Van

Lake Van in southeastern Turkey (cf. **Figure 2.8**) is an important proxy data source for climate reconstructions. It is also a terminal lake, fed by rivers originating in three different climatic regimes, and analyses of sediment cores dated by varve counting have provided valuable information spanning the Holocene (Wick et al. 2003, pp. 666-667). The sediments have been a source of a number of paleoclimatic records associated with various environmental aspects, such as ratios of $^{18}O/^{16}O$ and Mg/Ca (salt deposits), and pollen (Wick et al. 2003, pp. 673-674 – also cf. Issar & Zohar 2007, p. 24; Wossink 2009, p. 18). The ratio of Mg/Ca can attest to changes in the salinity of a body of water through time (also cf. 2.4.3), where high ratios indicate high salinity and thus low degree of dilution and low water levels, and *vice versa* (Wick et al. 2003, p. 667). The oxygen isotope proxy data is used in the same way as for the Soreq Cave research (cf. 2.4.2), although there is one further cautionary aspect to take into account for the Lake Van deposits. Rivers feeding the lake could get their water input both from catchment precipitation and from karstic springs (cf. 2.1.2), the latter of which in fact could have stored this water for some time before outputting into the hydrological system again – perhaps as much as 200-300 years. During such retardation some salt content may already have been deposited in the aquifer geology, and thus not entering the chemical composition of the lake sediments (Issar & Zohar 2007, pp. 24, 137). In other words, contrary to proxy data from Soreq Cave and the Dead Sea, the data inferred from Lake Van sediment analyses is not *necessarily* contemporaneous with actual climatic shifts (Issar & Zohar 2007, p. 137).

In short, the analyses of salt ratios and oxygen isotope values from Lake Van, together with those of charcoal and pollen suggest that the region experienced favourable climatic conditions between 6.0 and 4.0 ka BP, with a minimum $\delta^{18}O$ value at c. 4.5 ka BP suggesting a Holocene optimal peak in mid-3rd millennium BCE, followed by values indicating intensively more arid conditions c. 4.5-4.0 ka BP, with a brief reversal at c. 4.1 ka BP. Thus, the climate shifts toward a more continental type, with a decrease in humidity and generally a drier climatic regime. Although human activity becomes visible in the paleobotanical record around 3.8 ka BP, the area does not seem to be subjected to any intense exploitation. Local deterioration of vegetation, particularly its oak woodlands, is therefore most likely a response to the increasing desiccation of the region, which is thought to have stabilised along modern climatic conditions about 2.0 ka BP (cf. Wick et al. 2003, pp. 673-674; Wossink 2009, p. 18, with references – cf. **Figure 2.11**). While the potential lag in salt deposits mentioned above could have tweaked the chronology somewhat, the internal and external correspondence of these results probably make the Lake Van sediment analyses valid for the 3rd millennium BCE

– and once more attest to a mid-millennium optimal peak and late-millennium climatic deterioration.

### 2.4.5 Teçer Lake

Another Anatolian proxy data source studied very recently is Teçer Lake, located in central Turkey (cf. **Figure 2.8**). It has slightly different attributes compared to Lake Van and other terminal lakes, as it does have an outflow, but only when the water level surpasses a depth of 3-4 m, although when lower it turns into a saline lake surrounded by brackish swamps (Kuzucuoğlu et al. 2011, p. 174). Kuzucuoğlu et al. (2011, pp. 176-179) interpreted data relating to climatic developments during the last 6.0 ka from analyses of mineral and geochemical compositions of Teçer Lake sediment cores in light of its locational and geological characteristics. Chronology was provided by 13 AMS $^{14}$C dates from stratigraphically controlled pollen grains, down to a resolution of c. 50-80 years. Sediment deposits with a high clay content were interpreted as being remnants from a time of moist periods with high water levels, while on the opposite side of the spectrum were gypsum peaks following aragonite peaks, indicating regional desiccation and arid periods (cf. Kuzucuoğlu et al. 2011, pp. 176-177, Table 1).

Kuzucuoğlu et al. (2011) also evaluated the sedimentation within each individual climatic phase separately. Their phase III (c. 4950-4300 BP, corresponding to c. 3000-2350 BCE) and the first part of phase IV (c. 3850-2800 BP, corresponding to c. 1900-850 BCE) would roughly correspond to the temporal focus here (cf. Kuzucuoğlu et al. 2011, p. 181, fig. 6). High sedimentation rates in these two phases at Teçer Lake, particularly in phase IV made it possible to identify distinct subphases within the sediments (Kuzucuoğlu et al. 2011, p. 177). The first half of the 3$^{rd}$ millennium BCE (phase III-a) seems to have experienced a sudden decrease in rainfall and subsequent lake-level drop (Kuzucuoğlu et al. 2011, p. 181). Kuzucuoğlu et al. (2011, p. 184) argued that while this at first seems like a different picture to that shown by other eastern Mediterranean records – which generally suggest that this period was relatively moist – they could also point to a parallel in the Soreq Cave record, where a dry event signal occurs at c. 4.7-4.55 ka BP. However, following this event at Soreq Cave is a moist mid-millennium reversal of desiccation, and the disappearance of aragonite and decrease of gypsum in phase III-b (c. 2530-2350 BCE), as well as a lake-level rise, suggest likewise a return to wetter conditions at Teçer Lake at this time. Phase III ended in a 450-year long hiatus (c. 2350-1900 BCE) attested by a sudden rise in gypsum-rich sand and lake-level drop (Kuzucuoğlu et al. 2011, p. 181). The hiatus is continuous, as opposed to the Soreq Cave record, which rather shows this phase as three dry spikes (4.3-4.15 ka, 4.05-4.0 ka, and 3.9-3.85 ka BP), suggesting that Mediterranean humid air did reach the Levant at times, but not Anatolia (Kuzucuoğlu et al. 2011, pp. 184-185). Finally, Teçer Lake phase IV is characterised by high, but fluctuating values of aragonite and sand, implying climatic instability within a drying trend interspersed by short moist episodes, with these oscillations increasing in intensity during the phase as a whole. The first subphase, dated to c. 1900-1680 BCE and thus the one relevant here, shows lower lake-levels and run-off erosion depositing gypsum-rich sand, probably triggered by spring melting and summer evaporation stress (Kuzucuoğlu et al. 2011, pp. 181-83, 185). This indicates a possible shift to a slightly different seasonal climatic regime than that of the 3rd millennium BCE. Kuzucuoğlu et al. (2011, p. 186) proposed that particular local geographical conditions resulting in differences regarding timing or intensity could provide an explanation for certain variations in the Teçer Lake record compared to climate proxies from other Near Eastern sites.

### 2.4.6 Deep sea cores

Cores drilled in the sea bed have also provided sources of proxy records for paleoclimatic developments (cf. **Figure 2.8**). One of these sites is linked to aeolian transport of mineral dust which gets deposited in the Gulf of Oman by the annual southwesterly winds (*shamal*) originating in Mesopotamia (cf. Cullen et al. 2000, p. 380). This dust has a characteristic mineral composition and can thus be identified in a sedimentation sequence. Analyses of isotope ratios and concentrations of dolomite vs. calcite carried out by Cullen et al. (2000) on a core from the Gulf of Oman, have provided a 25 ka sequence of climatic conditions chronologically controlled through AMS $^{14}C$ dating of foraminifera in the stratigraphy. Increases in carbonate mineral concentrations were interpreted as deteriorating climatic conditions and aridity in the region of origin, shown to have indeed been Mesopotamia through analysis of Nd and Sr isotope compositions in the deposits – other possible sources were Zagros and the Indus valley (Cullen et al. 2000, pp. 380-381). Their results were characterised by only small variations in carbonate minerals in the period between 6.0 ka and 2.0 ka BP, but with two notable anomalies – the first at c. 5.2-5.0 ka BP and then at c. 4.1-3.6 ka BP (cf. Cullen et al. 2000, p. 381, fig. 4). Although the first anomaly and the last half of the second anomaly (i.e. about 3.9-3.6 ka BP) only attest to a relatively minor spike in concentrations, the arid event at c. 4.1-3.9 ka BP would have to be considered a substantial increase of these deposits, and it starts at 4025±150 BP dated by $^{14}C$ (Cullen et al. 2000, p. 381).

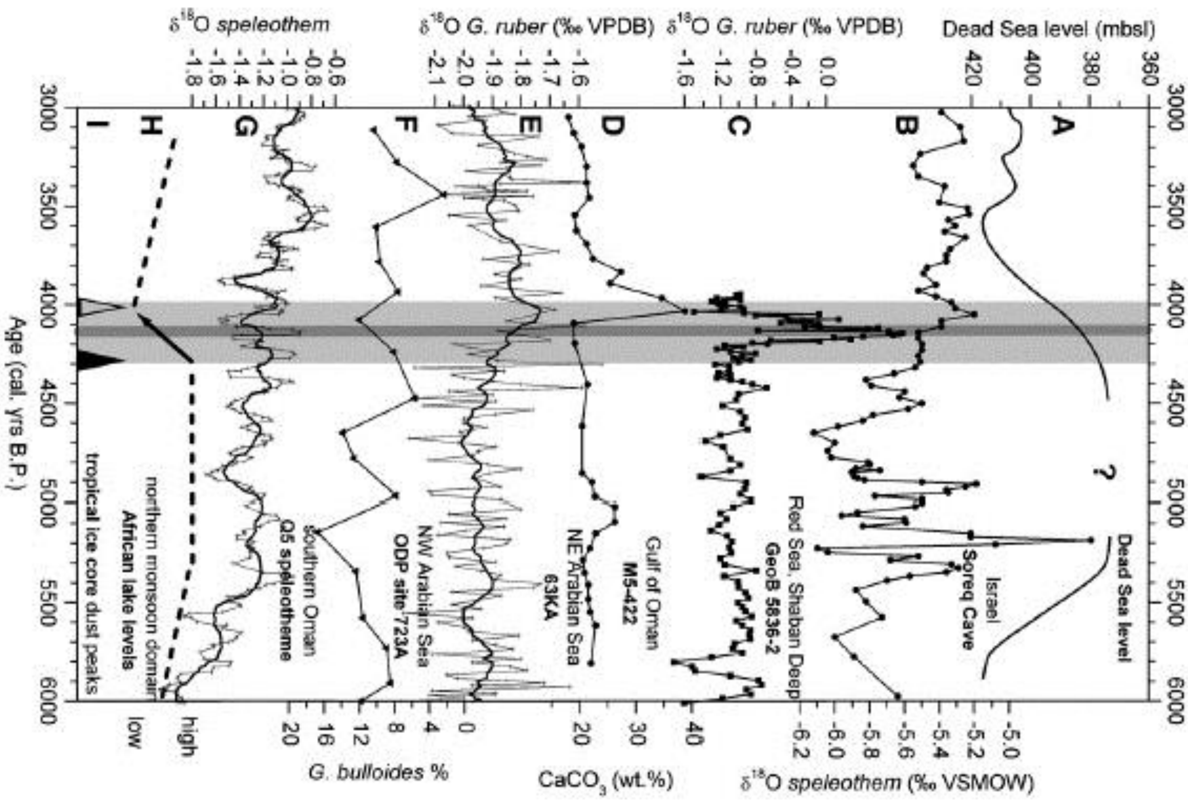


**Figure 2.10:** Deep sea records from the Gulf of Oman, the Arabian Sea, and the Shaban Deep which Arz et al. (2006) compared with African and Dead Sea lake level data and speleothems from southern Oman and Soreq Cave. The consistency between them with regard to the attestation of a late-3rd millennium BCE dry spike – marked with grey in this figure – is striking (after Arz et al. 2006, p. 439, fig. 6).

Another Near Eastern proxy site for deep sea core analyses is the Shaban Deep in the Red Sea, where accumulated brine layers annually deposited by the circulation between the surface and deep waters were studied by Arz et al. (2006) in light of paleoclimatic change. They measured oxygen isotope ratios on planktonic foraminifera and dated their associated sediments by AMS $^{14}C$ dating. Based upon the demonstrated mechanism that the mixing of water columns is related to the properties of the surface water – which is subject to climatic changes – affecting deep sea formation processes like variations in brine deposition, they reconstructed a climate record for the past 6.0 ka, but significantly for this study, focused on developments in the late 3rd millennium BCE (cf. Arz et al. 2006, pp. 435-437, Fig. 4). Similar to the Gulf of Oman results, the Red Sea data is characterised by small fluctuations in the isotope values in foraminifera in the period up to 4.2 ka BP, as well as virtually no variation in sea-surface temperatures (SST). However, between 4.2 and 4.0 ka BP a strong anomaly occurs in both records (**Figure 2.10**), which is particularly evident in $\delta^{18}O$ values and the number and size of foraminifera specimens, both indicating a change to more unfavourable environmental conditions. This does not seem to be linked to changes in SST, as this stays more or less constant throughout the time-span of the core. The deep sea core research thus falls into line with the other ones presented here, in that it identifies a strong climatic deterioration close to the EBA-MBA transition.

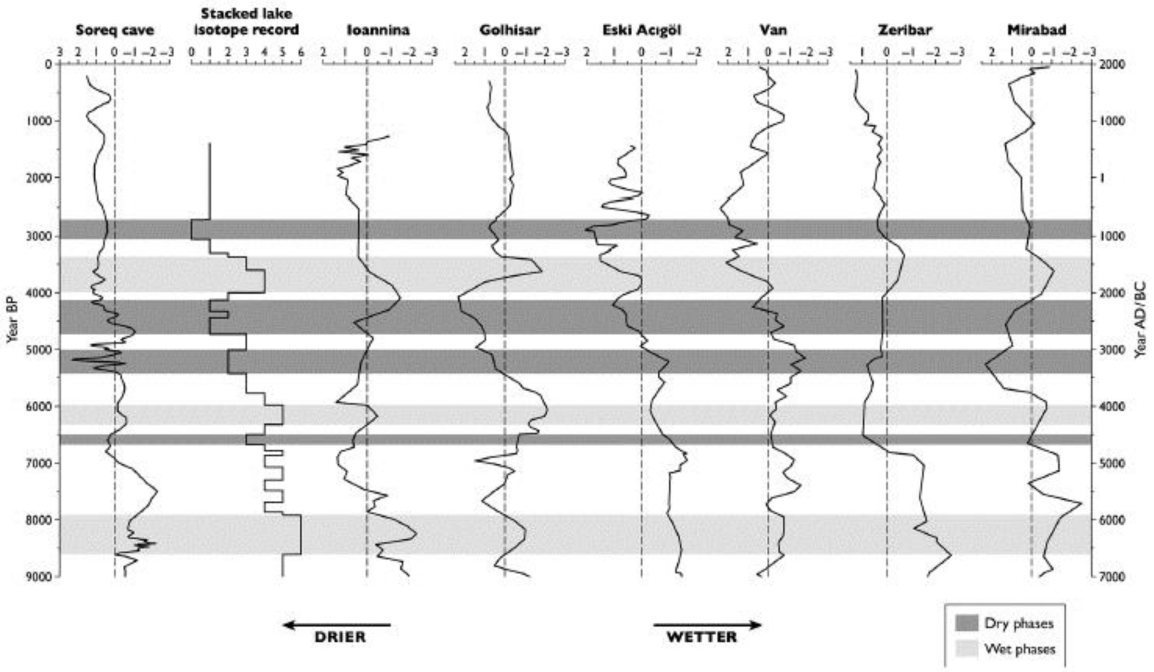



**Figure 2.11:** Oxygen isotope values from six lakes in the eastern Mediterranean summarised and presented by Roberts et al. (2011b) and compared with the proxy record from Soreq Cave. They also marked distinct dry and wet phases identified in these data sources. The late 3rd millennium BCE climatic deterioration is clearly standing out in the middle and also highlights the general drying trend of that millennium (after Roberts et al. 2011b, p. 150, Fig. 2).

### 2.4.7 Other sources for paleoclimatic records

Finally, certain other paleoclimatic records analysed in the same manner as e.g. Lake Van or Tecer Lake could fruitfully be mentioned with regard to a study of the EBA and MBA Near East (cf. **Figure 2.8**). The methods used in these include analyses of oxygen and other isotopic values, mineral compositions, pollen, or comparative multiproxy data. At Lake Zeribar vegetation and sedimentation analyses yielded signs of intensified erosion possibly disturbing the aquatic vegetation in the period c. 5.5-4.0 ka BP, overlapping with a decrease in oak and an increase in *Salix* c. 4.5-3.8 ka BP, the latter indicating particularly pronounced reduction in water levels. There were also data indicating a development of a marshy fringe surrounding the lake c. 4.0 ka BP, which by c. 3.5 ka BP has a composition of species similar to the present-day (Wasylikowa et al. 2006, pp. 482, 491). At Göbekli Tepe, $\delta^{18}O$ and $\delta^{13}C$ isotope values from pedogenic carbonate stones in buildings for the period roughly 6-4 ka BP was interpreted as caused by humid climate, while values from the subsequent period was indicative of arid conditions (Pustovoytov et al. 2007, p. 325). Roberts et al. (cf. 2011b, pp. 149-151, Fig. 3) summarised stable isotope and pollen records from lakes across the Near East, e.g. Lake Mirabad (also cf. Stevens et al. 2006) and Eski Acıgöl, and compared the data with the Soreq Cave proxy record, to study implications for climate, vegetation, and culture change. Their main conclusion was that a stepwise transition from a humid early Holocene to arid late Holocene took place, characterised by an oscillating, downward trend of alternating wet and dry phases, and identified three main arid phases dating to c. 3300-3000 BCE, c. 2500-1900 BCE, and c. 1200-850 BCE interspersed with moister periods, particularly between the latter two (**Figure 2.11**). The arid periods themselves they characterised as comprising several drought episodes, interspersed by wetter years – thus almost as miniature parallels to developments on the grander scale. As the general pattern is similar for all the Near Eastern lake records, the researchers suggest that differences between them probably are rather due to chronological imprecisions than actual variation. As a case study, Roberts et al. (2011b, pp. 153-154, Fig. 4) noted that studies of carbon isotopes in plants at Tell Mishrife and Tell Mardikh (cf. 2.6.2) identified three arid phases at c. 3100-2900 BCE, 2200-2050 BCE and 1800-1650 BCE, with at least two interspersed wet phases at 2500-2350 BCE and 1600-1500 BCE, and a relatively wet phase c. 2050-1800 BCE (**Figure 2.12** – also cf. Fiorentino et al. 2012, pp. 25-26). The humidity during this latter period was far below the levels prior to c. 2300 BCE, but it was still considered wet in comparison to its preceding and subsequent phases. Finally, and to complete the circuit of the Near Eastern climatic records as it were, I will briefly mention the work of Parker et al. (2006), who carried out a geochemical analysis of intra-dune lake sediments at the site Awafi in the UAE, dated by OSL (also cf. 4.6.2) and AMS $^{14}C$. Their results suggest that a lengthy arid period in the 4$^{th}$ millennium with major dry peaks at c. 5.9 and 5.2 ka BP was followed by a return to moist conditions and the development of a shallow lake at the site between 5.2 and 4.2 ka BP. This created potential for human habitation, and mobile groups returned to the area after an occupational hiatus of c.

1000 years, constructing large numbers of burial cairns there (Parker et al. 2006, p. 472). However, from c. 4.2 ka BP the deposit analyses attest to a severe desiccation and influx of aeolian sand, followed by a short-lived wet phase sometime in the 2nd millennium BCE, which yet again ends in an onset of intense arid conditions, more or less similar to conditions the region experiences today  (Parker et al. 2006, p. 473).

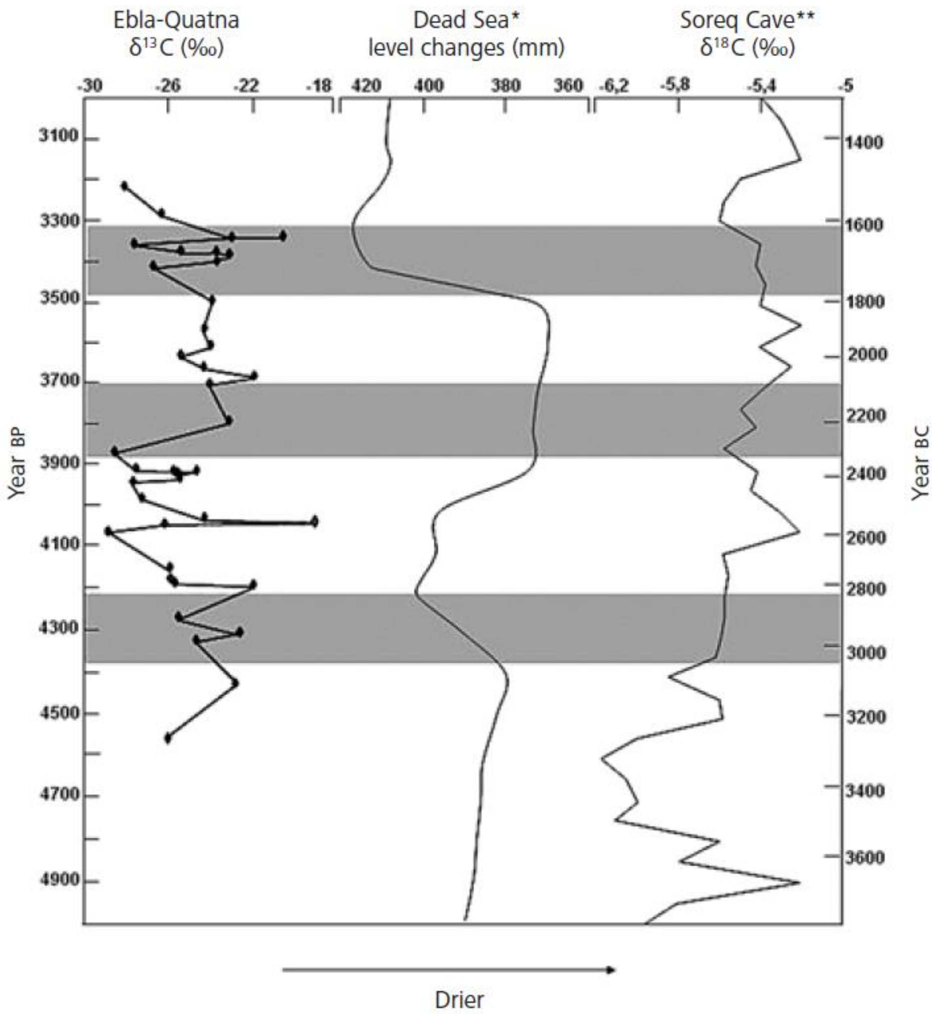



**Figure 2.12:** Phases of wet (white) and dry (grey) conditions at the archaeological sites of Tell Mishrife and Tell Mardikh seen in relation to the Soreq Cave data and the changes in Dead Sea water levels (after Fiorentino et al. 2012, p. 26, fig. 5). Certain correlations are discernable, although the oscillations seem more frequent in the data from the archaeological sites.

Thus, most climatic records across the region, from the Levant to Anatolia and Zagros to the Arabian peninsula, seem to paint the same picture. Each millennium, from the 4th to the 2nd BCE, was characterised by severe dry events, and thus significantly one affecting the Near East in EBA IV. Climatic developments in the 3rd millennium BCE itself was one long downward trend from wet conditions in the early, via an arid spike c. 4.8-4.7 ka BP, returning to a moist middle part, ending in a severe drought from c. 4.2 ka BP. The period c. 4.5-3.5 ka BP has in fact been considered a transitional phase between an early-Holocene optimum to the present dry conditions of the late Holocene (cf. Roberts et al. 2011b, p. 151, Fig. 3). It seems reasonable to think that Near Eastern societies would have experienced this deterioration as a real event and attempted to alleviate its effects. However, before turning to such matters (e.g. cf. 2855.2.2.2), I will look closer at the atmospheric mechanisms of such climatic change (cf. 2.4.8) and its details (cf. 2.5).

### 2.4.8 Global mechanisms and Near Eastern climate change

There is enough evidence from Near Eastern proxy data to suggest that the regional climate shifted and oscillated throughout the Holocene, and particularly in the 4th and 3rd millennium BCE. The geographical position of Syria and its topographical and ecological features make it very sensitive to climatic variations (cf. 2.1 and 2.3). Not only regional meteorological systems, such as Mediterranean storms (cf. 2.2.1), but also global climatic factors, like African westerlies and the monsoons of the Indian Ocean, all influence Near Eastern conditions (Fiorentino et al. 2008, pp. 51-52). However, the interplay between all these meteorological phenomena is a highly intricate atmospheric system, incorporating the two of most important weather systems on the planet. The El Niño-Southern Oscillation (ENSO) and the NAO, although not well understood (Wanner et al. 2008, p. 1808), have both a complex and major impact on all global climates and environments. Between them lies the ITCZ (Issar & Zohar 2007, p. 12; cf. Fleitmann et al. 2007 and Wanner et al. 2008, pp. 1816-1819 for a summary on the ITCZ and Holocene climatic change), a seasonally migrating low-pressure zone near the equator where polar and equatorial air converge due to temperature gradients and the Coreolis effect. The same atmospheric processes create two belts of high pressure on the 30° latitude on either side of the equator. At this point air sinks down toward the Earth, where some flows toward the poles, but most goes back to the ITCZ (cf. Cech 2005, p. 37). Due to its effect on the monsoon winds, the annual migration of the ITCZ asserts a major influence on the Indian Ocean climate and its surroundings, and it reaches its northernmost latitudes during the Near Eastern summer (Fleitmann et al 2007, p. 172).

The NAO system has been suggested to constitute the main force behind climatic swings in the eastern Mediterranean and the regional cyclogenesis. Rainfall variability and anomalies in the region today have been associated with large-scale, high-amplitude variability of the

North Atlantic climate (Eshel & Farrell 2000, p. 3230). Cullen and deMenocal (2000, pp. 861-862) suggested that the NAO was correlated with precipitation in the catchment areas of the Euphrates and the Tigris, but Enzel et al. (2003, p. 271) re-evaluated the data and concluded that contrary to this, it is only very weakly or even not at all correlated with rainfall in neither the Levant nor the Euphrates headwaters. Their analyses indicated that the NAO does not directly impact the Levant and can only explain less than 5 % of the precipitation variation in the Near East, although it asserts larger influence (> 25 %) on the Eastern Mediterranean proper, which may have a certain effect. Thus, as its association with Near Eastern rainfall is debatable, the relation between the NAO index and Holocene climatic events seems uncertain (Frumkin 2009, p. 320). On the other hand, air circulation patterns could have had a different character in the past, resulting in different atmospheric patterns than those we see today (van Zeist & Bottema 1991, p. 16), and the interplay with other atmospheric processes could have had complex effects (**Figure 2.13** – also cf. **Figure 2.14**).

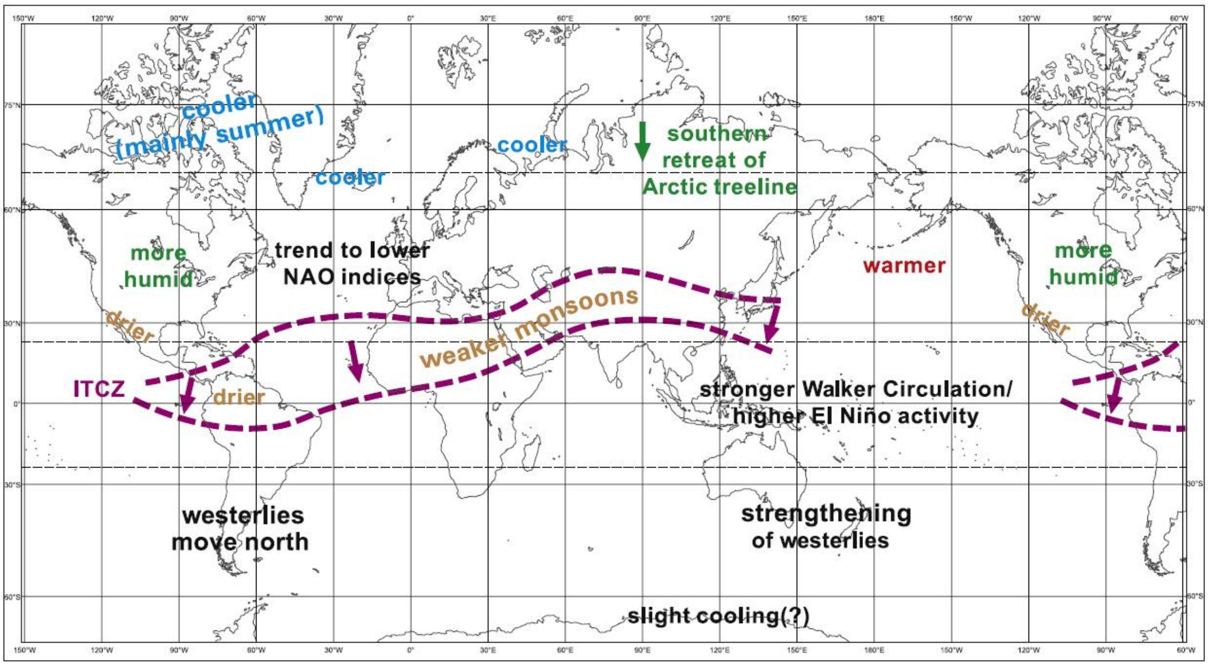



**Figure 2.13:** Mechanisms of natural climate variations and some of the large-scale climatic consequences seen in a global perspective. Additionally, the figure shows the Holocene migration of the ITCZ (after Wanner et al. 2008, p. 1817).

The Indian Ocean monsoon system indirectly affects the eastern Mediterranean, as northeasterly air flow circulate around the South Asian Low Pressure centre, but a position of the monsoon circulations further north earlier in the Holocene as well as regional variations in SST could have resulted in a higher impact on Near Eastern conditions at that time (Roberts et al. 2011a, p. 6). Several studies on paleoclimates indicate that the latitudinal position of the ITCZ has in fact shifted during the Holocene, leading to different patterns of its annual migration and significant changes in regional hydrological regimes (cf. Fleitmann et al 2007, p. 170, with references). A southward shift of this system appears to have occurred rather abruptly around 6 ka BP. Prior to this, the monsoon directly affected much further into the interior of the Sahara and Arabian deserts, although perhaps not as far as the Mediterranean sea (Roberts et al. 2011a, p. 9, with references). The strong mid-Holocene desiccation of northern Africa was therefore probably caused by such a southward migration of the ITCZ and consequently a weaker African monsoon (Magny et al. 2009, p. 831). Fleitmann et al. (2007) studied oxygen isotopes in stalagmites on the Indian Ocean island of Socotra, supported by data from Oman and Yemen, and showed that the values of $\delta^{18}O$ had decreased since 4.4 ka B.P. from -3.0 ‰ to the current -4.2 ‰, reflecting a higher monsoon precipitation along the rim of the Indian Ocean (Fleitmann et al. 2007, p. 176). According to their research, the cause of this change was a southward shift of the summer ITCZ and consequently also the associated monsoon rain. This could explain the abrupt aridity seen in the paleoclimatic records, e.g. when the shift moved across a threshold, changing how the Near East would be affected by the monsoon (Fleitmann et al. 2007, pp. 180, 184 – cf. **Figure 2.14**). The mechanism behind this permanent migration through the Holocene was probably orbital changes in seasonal insolation associated with Milankovitch forcing. This is supported by the fact that insolation in the late Holocene became more seasonal in the Southern Hemisphere, while at the same time turning less seasonal in the Northern Hemisphere (Haug et al. 2001, p. 1307). Vannière et al. (2011, p. 54) argued that orbitally forced changes in summer insolation affecting the Northern Hemisphere during the Holocene probably also led to climatical and ecological changes in the Mediterranean region, which thus came in addition to the latitudinal changes in the ITCZ. However, the ITCZ only acts indirectly on the Mediterranean, and has not extended as far north as to impact it directly (Vannière et al. 2011, p. 56 – cf. **Figure 2.14**). Finally, such orbital changes could also have affected the regional SST, where lower temperature and consequently lower evaporation rates from the Mediterranean potentially influenced the regional cyclogenesis (Roberts et al. 2011a, p. 9), so important for the Near Eastern climate and environment (cf. 2.2.1).

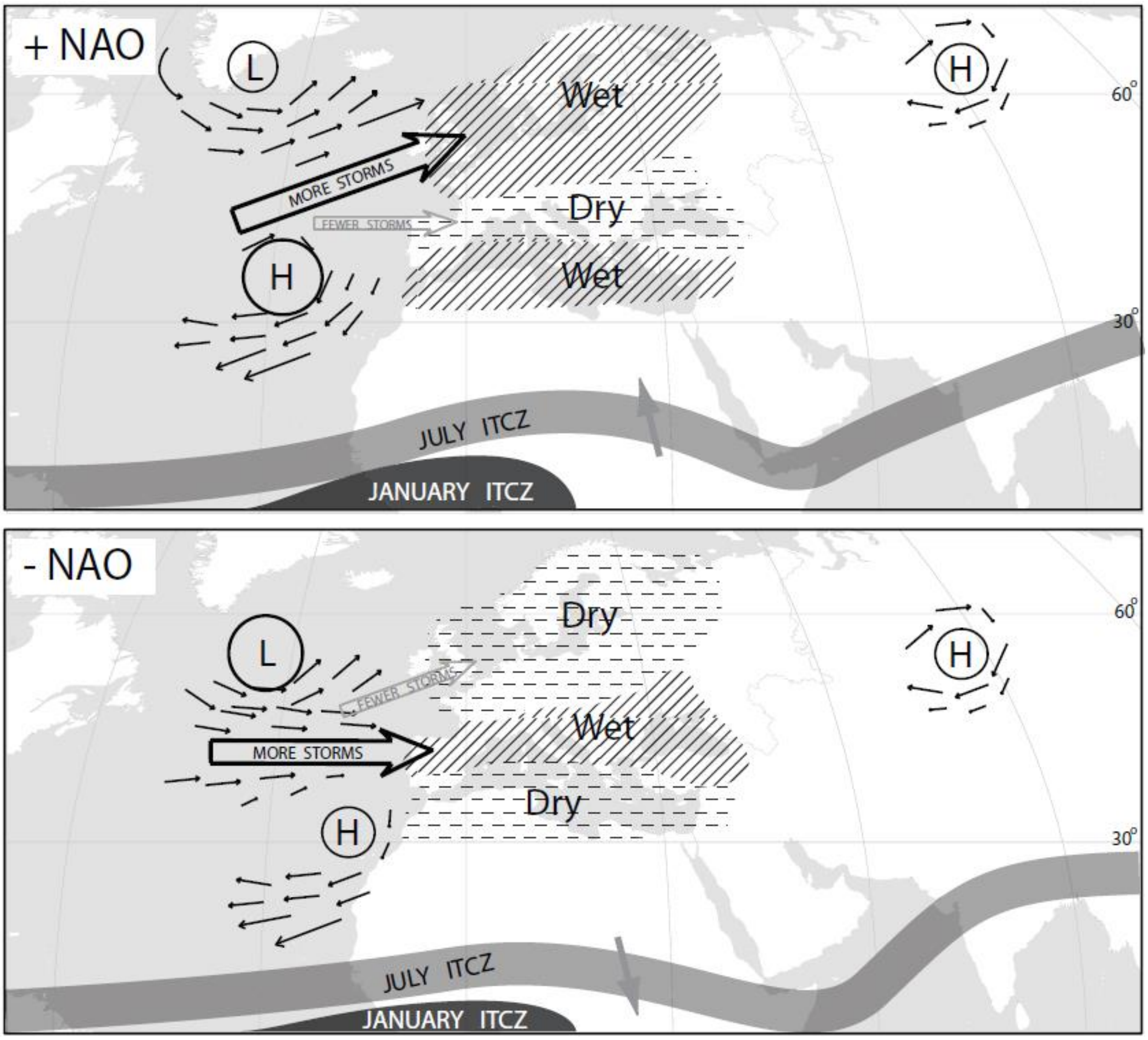



**Figure 2.14:** Stylised representation of how shifts in the ITCZ mechanism interplay with the NAO and affect climatic conditions of western Eurasia. With an ITCZ associated with a summer boundary further north, the NAO would also shift, and thus change the character of regional precipitation patterns, possibly resulting in a wetter Near Eastern climate. However, a southward Holocene migration may have had the opposite effect (after Vannière et al. 2011, p. 57, fig. 2).

As a preliminary conclusion, it seems likely that a southward shift in the northern limit for the annual ITCZ migration was a factor in the late 3rd millennium BCE climatic deterioration in the Near East, although due to the complexity of these processes it is very hard to say anything definite on the matter. However, it is striking that the research carried out by Fleitmann et al. (2007) provides a starting point at c. 4.4 ka BP for an increase in Indian Ocean precipitation. This roughly coincides with the most pronounced 3rd-millennium BCE arid spike in Near Eastern paleoclimatic records, better known as *the 4.2 ka BP event*.

## 2.5 The 4.2 ka BP event

It is evident that most paleoclimatic sources show a strong dry signal occurring toward the end of the 3rd millennium BCE, sometimes seen as part of a general and lengthier climatic deterioration spanning the late EBA and early MBA. While its attestation seems more or less unequivocal, the exact nature of the event has been debated. Was it an abruptly occurring drought or more gradual as part of a drying trend, and was it oscillatory in profile or one long drought which thereafter returned to the previous climatic state (Wossink 2010, p. 182). This subchapter aims to look closer at the 4.2 ka BP event as a phenomenon, as it roughly played out across the main period of the present study. In this respect, I should note that here it is not seen as an short-lived – e.g. half-century to century long – event, but rather the onset of a half-millennium climatic phase, and possibly the starting point of the dry late-Holocene conditions in the Near East (cf. 2.4.7).

### 2.5.1 The abruptness of the event

Some proxy sources clearly show the 4.2 ka BP event to manifest itself initially as a sudden climatic drop. However, its precise timing is a source of dispute, due to the various methods applied at the various sites resulting in a somewhat fuzzy picture. At Teçer Lake, a 450-year hiatus starts c. 4.35 ka BP, which is slightly earlier than in other sources. The Dead Sea data attests to an abrupt drop in water level at 4.3 ka BP, although this record has been known to carry certain inherent uncertainties associated with its chronology, due to potential later contamination of deposits or the nature of the process which leads to the deposition of datable wood (cf. 2.4.3). The proxy record from Soreq Cave shows a similar picture, albeit more detailed and chronologically certain, with the event being initiated by a major arid spike c. 4.3-4.2 ka BP (cf. **Figure 2.9**), while the deep sea cores further south exhibit massive dry spikes at 4.2-4.2 ka BP indeed (cf. **Figure 2.10**). However, Marro and Kuzucuoğlu (2007, pp. 586-587) on the other hand characterised the event rather as the peak of a long-term aridification trend starting back in the 4th millennium BCE, which increased in magnitude after c. 4.5 ka BP. They argued that in the drier parts of the Near East, this trend started to show in already during the first half of the 3rd millennium BCE, but affecting larger areas after the midpoint of the millennium. They stressed that some signals may seem very dramatic, but these were also interspersed with moister phases. Such a gradual degradation of the climate could in fact allow for e.g. societal adaptation, and not necessarily in practice be experienced as dramatic as a graphic illustration can allude to. Wanner et al. (2008, p. 1818), although working on a grander chronological scale and using time series simulations, also toned down the rapidity and dramatic nature of the 4.2 ka event while still identifying its global significance and possible association with the ENSO (cf. 2.5.3 and **Figure 2.13**). Arz et al. (2006, pp. 438-440) reviewed various paleoclimatic records and argued that observed climate changes around 4.2 ka BP in many cases were *not* characterised by abrupt events, but rather occurred as part of long-term trends. However, they acknowledged that some records do show a spiked profile at this exact point in the Holocene. Although climatic conditions evidently did fluctuate to some degree during the 3$^{rd}$ millennium BCE, the peak levels of aridity around 2200 BCE still stands out as an extremity when seen in a larger diachronic climatic context in the Near East (Issar & Zohar 2007, p. 135). For instance, in the Soreq Cave record (cf. **Figure 2.9**) it constitutes the driest point in time since the mid-late 4$^{th}$ millennium BCE. It is possible that various areas experienced the event differently, depending on factors of geography, topography, biology, or even geology (cf. 2.1.2), leading to results that might be slightly asynchronous or oriented differently (cf. Kuzucuoğlu 2007, pp. 22, 26), or causing the appearance of either abrupt spikes or more gradual dips or downward trends. The proxy data from Soreq Cave, Lake Van, and Teçer Lake (2.4.2, 2.4.4, and 2.4.5) do suggest favourable conditions c. 4.5-4.3 ka BP, and isotope values from Tell Mishrife and Tell Mardikh (cf. **Figure 2.12**) show relatively moist conditions diving straight down into an arid spike at c. 4.3-4.2 ka BP.

Thus, based on the present evidence, I would argue that the event seems to have occurred rather abrupt in its immediate context, particularly as a phase of apparently high degrees of precipitation took place in the preceding two centuries – and thus at least within collective memory of populations living in the Near East. The records seem to generally agree upon an onset of the so-called 4.2 ka BP event sometime between 2300 and 2200 BCE. However, it was probably also part of a longer downward trend beginning earlier in the millennium, taking the shape of a series of increasingly intense oscillations, and ending in a major climatic Holocene nadir stretching across the extended EBA-MBA transition.

### 2.5.2 The profile of the event

The profile of the event – i.e. how climatic conditions developed across that approximate half-millennium period (c. 2350-1750 BCE) – is another issue. It does somewhat hinge on which proxy source under study and is especially dependent on the available resolution of its chronology. Soreq Cave is perhaps the best proxy source, as it is associated with particularly high resolution, while Lake Van could also be characterised as a high-resolution site from its dating through varve counting (cf. Kuzucuoğlu 2007, p. 28). Evidently, detailed chronology is crucial to distinguish dry from moist phases within such a short period, relatively speaking. However, different proxy profiles may also be caused by actual differences, thus making it rather difficult to be categorical about climatic developments from the late EBA to the MBA. Data from the Soreq Cave apparently show three successive arid spikes between 4.3-3.85 ka BP, namely at 4.3-4.15 ka, 4.05-4.0 ka, and 3.9-3.85 ka BP (cf. **Figure 2.9** and **Figure 2.12**), while e.g. Tecer Lake only attest to a 450-year drought hiatus starting c. 4.3 ka BP and ending c. 3.9 ka BP, initiated by shorter humid subphases interspersed with more intense arid phases within a 2nd millennium BCE drying trend. Rather than differences in resolution, the explanation may be that humid air from the Mediterranean reaching the Levant and Soreq Cave was depleted during these moister intervals before it could reach central Anatolia and Teçer Lake (Kuzucuoğlu et al. 2011, pp. 184-185). On the other hand, a moist phase is seemingly occurred at Lake Van around c. 1900 BCE and slightly later at Lake Mirabad, with arid spikes on both sides (cf. **Figure 2.11**), and Wossink (2009, p. 18) also identified a brief reversal of the drought taking place at the former site around 2100 BCE in his research. While Enzel et al. (2003) profiled the Dead Sea level drop starting between c. 2300 and 2200 BCE and continuing nearly a thousand years until the end of the LBA at c. 3.4 ka BP, the curve presented by Migowski et al. (2006, p. 425 – **Figure 2.15**) attested in fact an abrupt and massive drop c. 4.3-4.2 ka BP, followed by a significant rise in the water level – even surpassing the level just prior to the event – at c. 4.0-3.9 ka BP (also cf. Wossink 2009, p. 18). This ended in a drop to a mid-Holocene low at c. 3.6-3.5 ka BP. However, the resolution here does not allow a very detailed profile, and there are several graph points to which uncertainties are associated (cf. **Figure 2.15**). Issar and Zohar (2007, pp. 136-137) presented in their synthesis of research presented the 4.2 ka event as starting c. 2200 BCE with a 100-year arid spike, followed by a slightly moister phase, until c. 2000 BCE when another drought set in, lasting until c. 1800 BCE, reaching a nadir during its last 100 years. Following this, the Near East experienced a turn to much better climatic conditions, facilitating an MBA cultural and material renaissance. Finally, the Tell Mishrife and Tell Mardikh response proxy (cf. **Figure 2.12**) shows a picture similar to Soreq Cave of three arid phases interspersed by two moister ones (cf. 2.4.7), albeit within minor chronological variations.

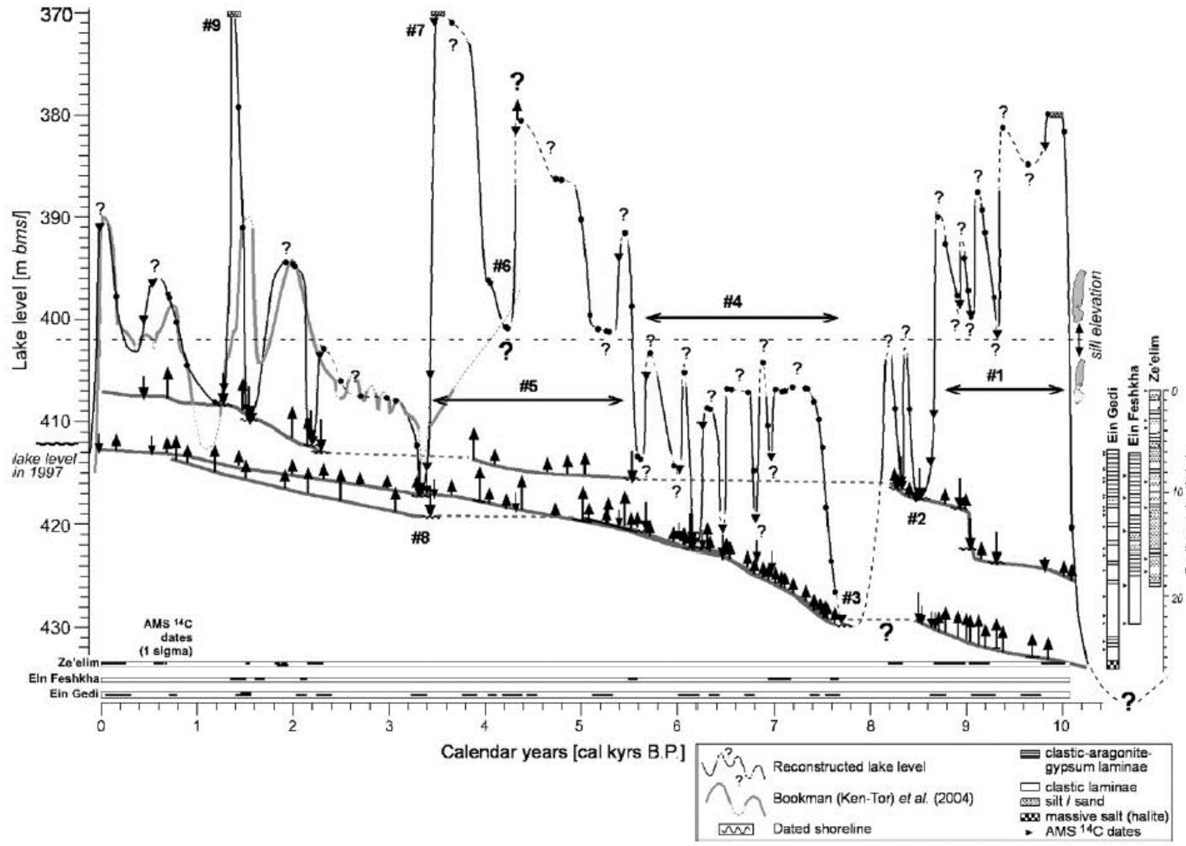



**Figure 2.15:** Actual and postulated lake levels in the Dead Sea through the Holocene (after Migowski et al. 2006, p. 425, fig. 3). Note the massive drop occurring just prior to 4.0 ka BP (c. 400 m below sea level) relative to the immediately preceeding and following periods (c. 370-380 m below sea level). The water level at that point was seemingly at its lowest since a similar nadir just prior to 5.0 ka BP, although not nearly as low as the current one (c. 410 m below sea level).

Although the data may seem slightly contradictory in terms of timing, I would argue that the 4.2 ka event can be described as a series of downward trending oscillations between rather intense dry phases and interspersed less dry to moist phases following an initial and probably dramatic arid spike (cf. 2.5.1). In particular, the century or so just before or around the turn of the 3rd millennium BCE and a short interval beginning c. 1800 BCE seem to have been less severe than the rest of the period in question. However, the MBA also ended in an even more pronounced arid spike in mid-2nd millennium BCE. This is also consistent with the climatic developments on a long-term scale, and just as for the long-term climatic developments, chronological turning points should be seen as approximate. There is also the crucial question of how the 4.2 ka event would have been manifest on the ground. The proxy records do not necessarily show seasonal variability in rainfall, but rather the annual average trend in isotope ratios, analysed and drawn as a curve. Roberts et al. (2011b, p. 152) described in their synthesis a regional climatic shift following c. 2250 BCE, where the semi-arid interior of the Near East became characterised by less precipitation, but also climatic instability. In contrast to more a predictable rainfall regime up to the 4.2 ka event, this took the shape of more randomly distributed showers or shortened periods in which these occurred, potentially affecting societies practicing dry-farming strategies in a major way, as well as probably also having an impact on mobile groups. More erratic rainfall tends to occur as intense and catastrophic showers, causing fluctuations in river discharge, lowered water tables, and exacerbated soil erosion, which would even have changed the flow of the Euphrates and the Tigris toward the turn of the 3rd millennium (also cf. Kuzucuoğlu 2007, p. 27).

### 2.5.3 Causes for the event

There is no generally accepted causal mechanism for a climate perturbation associated with the 4.2 ka BP event, although as its extent stretches from central and eastern Africa to Anatolia, it seems likely to be connected to the large climate systems, possibly even the global ones (Issar & Zohar 2007, p. 133; Roberts et al. 2011b, p. 152 – cf. 2.4.8). According to Bond et al. (1997, pp. 1257-1258), the North Atlantic has experienced a number of Holocene cooling events, e.g. 9.4, 8.1, 5.9, and 2.8 ka BP, in addition to the one at 4.2 ka BP. This is suggested by associated increases in species of planktonic foraminifera adapted to cold conditions. The 4.2 ka BP event was termed *the Holocene Event 3* by Mercuri et al. (2011, p. 193) and linked to a cooling of SST in the Atlantic Ocean by 1-2°C (also cf. Bond et al. 1997, p. 1261). In association with this it seems that cooler and wetter conditions in western and central Europe between c. 4.5/4.4 and 3.9/3.8 ka BP were correlated with changes in the SST and the salinity of North Atlantic sub-polar regions (Magny et al. 2009, p. 831 – cf. **Figure 2.14**). Thus, there seems to have been a connection between the NAO, its SST, and the climatic event occurring toward the end of the 3rd millennium BCE. Although Wanner et al. (2008, p. 1818) disagreed with regard to the abruptness of the event, they did concede that increased aridity from the mid-Holocene onward (i.e. the last 6000 years) should probably be attributed to a reduction in solar irradiance due to orbital forcing and a southward shift of the ITCZ (cf. 2.4.8) accompanied by weakening of the Indian Ocean monsoon system. These factors, i.e. suppression of the monsoon system and cooler SST, were also argued by Roberts et al. (2011b, p. 150) as the ultimate cause behind the 4.2 ka BP event. However, the seemingly abrupt arid spike visible in the Near Eastern climate records of this time indicates that also additional factors could have affected the region. Reduced summer insolation and subsequent differences in seasonal insolation caused by long-term progressive influence of orbital factors through the Holocene, could actually have led to a climatic-systemic crossing of a threshold occurring around 4.2 ka BP (Magny et al. 2009, p. 831). In regions where the environment would be sensitive to changes in climate and precipitation, such as the Palmyrene and Near Eastern interior, the effects on ancient societies may have been considerable.

### 2.5.4 The aftermath of the event

The aftermath of the 4.2 ka event, i.e. climatic conditions and the diachronic transition following the five or six centuries outlined above, also seems to be associated with some degree of ambiguity. Certain records from the early 2nd millennium, mainly the deep sea cores, indicate a return to moister conditions, but most suggest that the subsequent arid conditions were part of a more permanent climatic regime, closer to the type we see in the Near East today (Wossink 2010, p. 183). The final phase of the event could be considered to be represented by approximately MBA II (also cf. 2.5.2), at which time e.g. Roberts et al. (2011b, p. 152) concluded that the climate returned to wetter conditions. However, they also argued that humidity was far lower compared to the pre-event levels, i.e. prior to c. 2300 BCE. This point was also emphasised by Issar and Zohar (2007, pp. 136-137) in their synthesis, where they suggested a return to better climatic conditions around the start of MBA II (c. 1800-1600 BCE). Migowski et al. (2006, p. 426) also argued from the Dead Sea water level perspective (cf. 2.4.3) that the period after c. 3.9 ka BP experienced conditions similar to those preceding the 4.2 ka event, although the climate subsequently deteriorated once again c. 3.5 ka BP (cf. **Figure 2.15**). The Mount Sedom *Tamarix* analyses indicated twice the modern rainfall c. 1980 BCE, followed by deterioration to modern conditions c. 1880 BCE (Frumkin 2009, pp. 325-326). However, as this tree died long before the final MBA II moist phase, this evidence does not preclude any subsequent return to moist conditions, but seems more likely to attest the aforementioned climatic amelioration interpreted to have taken place around 2000 BCE. On the other hand, Fiorentino et al. (2012, pp. 25-26 – also cf. **Figure 2.12**) identified the period 1800-1650 BCE as an arid phase in their analyses of the carbon isotopes in plants from Tell Mishrife and Tell Mardikh, only acknowledging the moist interval at c. 2000 BCE as one of importance. However, they did note that decreases and increases in precipitation occurred during MBA II, which finally ended in a major drought peak at c. 1600 BCE. The Lake Van record (cf. 2.4.4) seems to show that modern conditions in fact did not set in until around 2.0 ka BP, but the onset of the deterioration toward this point started around 4.2 ka BP (Wick et al. 2003), thus suggesting a continuously deteriorating trend there. At Teçer Lake conditions seem to have improved after the hiatus (i.e. from c. 1900 BCE – cf. 2.4.5), but the climatic regime and associated patterns of precipitation shifted to a more intense and unstable one compared to the period prior to 4.2 ka BP (cf. Kuzucuoğlu et al. 2011, pp. 182-183, 185). This may possibly have been one of the main climatic consequences of the 4.2 ka BP event, with further implications for the regional populations and their land use patterns. However, there seems to be general agreement that the Near East was characterised by continuing deterioration within an oscillating trend after c. 1600 BCE, so the moister phase during the MBA II was an unstable interval, seemingly not lasting more than around one or two centuries. Thus, it seems clear that the climatic basis for various regional environments in the Near East changed quite a lot from the early and mid-3rd millennium BCE to the late 3rd to early 2nd millennium BCE and onward. Ecological responses to this would probably be manifest in paleoenvironmental material extracted from archaeological sites in the region, but also the timing and potential effects of ancient human impact on the landscape would be possible to discern from such sites. The next subchapter will focus on these aspects, followed by an attempt at reconstructing environments and ecologies relevant for a study of the Bronze Age Palmyrene.

## 2.6 Bronze Age environments and the anthropogenic impact

In addition to factors of climate and topography, exploitation of the natural environment by resident societies could also have affected the regional or local landscapes to various degrees. While it is quite clear that the currently degraded state of many Near Eastern ecologies (cf. 2.3) is due mostly to human exploitation in various ways, whether or not the threshold for no return was crossed in the 19th-20th century CE has been debated. Paleoenvironmental studies and data from archaeological sites constitute the main sources for answers to this question, and such research also adds to the picture of regional biomes and can be used to track diachronic vegetational changes in the landscape around the sites.

### 2.6.1 Human impact on vegetation

It seems likely to assume that human societies have impacted upon the Near Eastern environments through the ages in an ebb-and-flow pattern until the advent of motorised transportation. Thus, the main questions in the consideration of environmental contexts for a reconstruction of past landscapes are *when* can humans be identified in the vegetational picture and *how* did the development of cultural vs. natural landscapes unfold. Blondel (2006, pp. 713-714) argued from a Mediterranean perspective that human agency actually could keep landscapes diverse rather than ruining them. However, this position have invoked arguments labelling its opponents as extreme ecologists who view prehistoric environments as some sort of "Lost Eden" (also termed *ruined landscape theory*), which has subsequently degraded into badlands and deserts by deforestation and overgrazing. The reality probably lies somewhere in between, but the debate has brought up two concepts which are relevant in this discussion – resilience and resistance. Resistance can be defined as the amount of change caused by a disturbance, while resilience is the amount of time a system would require to recover from such an event. Even intensive grazing does not necessarily lead to a degraded environment, as combinations of wild and domesticated grazers and browsers could provide stability and diversity, and potentially maximizing ecosystem productivity and species diversity (cf. Blondel 2006, pp. 723, with references). On the other hand, ecologies in certain regions may possibly have been sufficiently degraded already in Classical times to not have the resilience to bounce back to a relatively natural state[6] when the human pressure ebbed and subsided – if

[6] Albeit obviously with an inclusion of imported species of vegetation which may have formed part of the cultural flora of the region.

it actually did subside at all in the following Islamic and Ottoman periods. Available evidence from Turkey suggests that e.g. its biomes have a potential for 70 % forest cover, but a mere 14 % of the country is covered by woodland today (van Zeist & Bottema 1991, p. 23). Certain parts of the region were cleared in the 1st millennium BCE and intense human activity there until it subsided in the 1st century CE seems indeed to have had certain environmental consequences. It took about 400 years for some types of vegetation to regenerate, while e.g. deciduous oak woodlands did not in fact recover at all from the Iron Age exploitation and clearance (van Zeist & Bottema 1991, p. 141). Nevertheless, anecdotal evidence from travel accounts (cf. 4.5.2) strongly suggests that fauna and flora in the Near East was much richer in both quantity and quality at the turn of the 20th century CE than it is today (cf. 2.3).

However, as the temporal focus here is on the period a millennium prior to the Iron Age, the extent of industrial degradation of vegetation and environment remains less relevant, although the comparative element may hold relevance. Clearly, certain parts of the Bronze Age landscape had relatively high densities of human habitation, and could potentially have impacted on surrounding biomes to a degree similar to societies of the Iron Age. Some paleoenvironmental records from Anatolia suggest that humans started making a visible imprint on the environment already in the Bronze Age, but the evidence for such clearance varies from the EBA to the LBA depending on the resilience of the local ecology (Roberts et al. 2011b, pp. 157-158). Climatic oscillations (cf. 2.4 and 2.5) would probably have amplified the consequences of clearance in arid periods, and spatial factors such as arid vs. humid environments would also have constituted a significant weight on the balance of ecological pressure. While tree coverage in the Near East as a whole probably reached its maximum around 6.0 ka BP, most pollen records from Bronze Age sites show that human habitation has visibly affected the nearby environment, and by the middle of the 1st millennium BCE the region would have been transformed into a series of cultural landscapes both due to exploitation and climatic deterioration (Roberts et al. 2011b, pp. 157-158). However, aspects such as density, society type, and economy are central when evaluating how humans may have altered ancient landscapes (Blondel 2006, p. 715). The abundance of charcoal from Iron Age sites does indicate that forests were covering many parts of the Near East, even beyond the LBA. Thus, despite a situation of moderate exploitation, conditions probably never crossed the boundary of environmental degradation and erosion known from recent times, when the threshold of ecological resilience was overstepped and followed by a disastrous decrease in regional biodiversity (Blondel 2006, pp. 726-727). Although biomes in the immediate proximity to major population centres probably would have been dominated by fields, parkland, and thinly wooded ecologies already in the EBA and MBA, large tracts of steppes and upland areas – such as the Jezire and the Palmyrene – would have been more inaccessible and inhabited by mobile populations. Such groups would also only have utilised these landscapes mainly on a seasonal basis (cf. 5.1.3 and 5.2.1.2), thus providing ecologies of low resilience with an opportunity for regeneration.

### 2.6.2 Data from archaeological sites

Paleoenvironmental material like pollen remains is a valuable proxy source through isotope composition analyses, but can also provide direct spatiotemporal evidence for vegetation species found in the environs of an archaeological site in a diachronic perspective. This must be considered as response data and could be a result of both climatic conditions and human interaction with the environment – or even be a consequence of sampling choice, e.g. as the firewood of preference for the site's inhabitants (Roberts et al. 2011a, pp. 3-4). Thus, such a source must be carefully considered, taking into account the various possible scenarios for its presence in the archaeological assemblage. Local environments and human populations probably had a synergistic relationship and both landscapes and sites were subject to climatic and anthropogenic site formation processes (Roberts et al. 2011a, p. 5). Fortunately, one of the largest sites of the Syrian Bronze Age, Tell Mishrife (ancient Qatna), is situated in relative terms just outside of what I call the Palmyrene region (**Figure 2.16**). This, as well as Tell Mardikh (ancient Ebla), have been subject to extensive and scrutinised excavations, which also have included an environmental perspective, including pollen analyses, as part of their integrated research (cf. Fiorentino & Caracuta 2007; Fiorentino et al. 2008; Fiorentino et al. 2012). Consequently, there are response data available for parts of central Syria, even though many of the proxy data sources lie quite a distance away from the area of focus here (cf. **Figure 2.8**), and vegetation compositions inferred from some of these sites will here add to the picture of the arid landscapes of Syria during the Bronze Age, together with climate records.

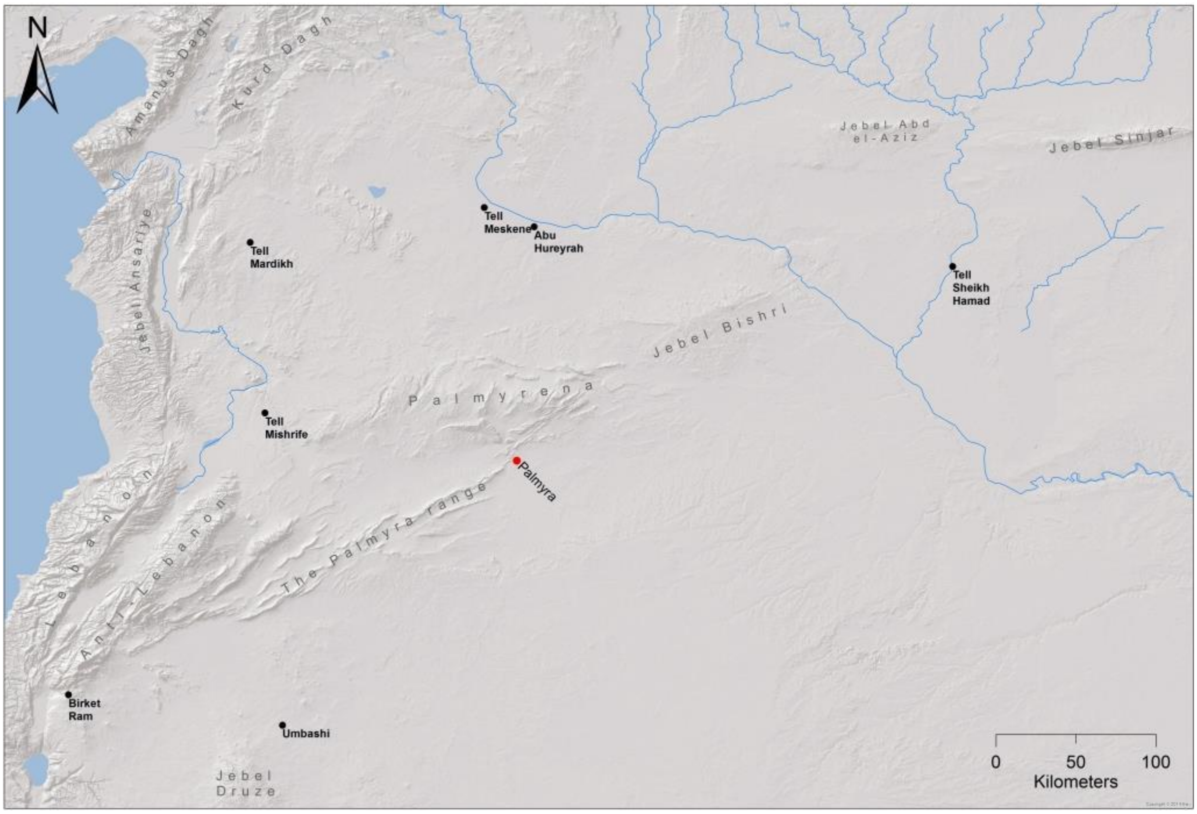



**Figure 2.16:** Sites on the fringes of the central Syrian region – or the extended Palmyrene – which have been subject to paleoenvironmental studies and are mentioned in subchapters 2.6 and 2.7.

Valsecchi (2007, p. 113) analysed pollen from Tell Mishrife, and her results indicate that the inhabitants of Qatna started to make an impact on the local environment during the last centuries of the EBA by clearing the woodland in the vicinity of the settlement. However, this seems to have been fairly localised activity and not resulting in any ecological degradation. During the MBA, when Qatna was a major political regional actor in the Near East (cf. 3.4.2.3), *Juniperus* dominated the botanical material of wild species, together with *Quercus* and possibly *Pinus*, while *Pistacia* and *Olea* may be species associated with the cultivated corpus of the site, but could equally well have constituted part of the natural vegetation of this landscape (Valsecchi 2007, p. 111). Thus, even with Qatna at its peak, the natural ecology seems to have been more or less intact on the whole during the MBA. However, something changes around 1680 BCE, with a decrease in Junipers accompanied by an increase in oak, suggesting that the landscape opens up. Valsecchi (2007, pp. 111-112) tentatively suggested that this may have been linked to smelting in the Edom highlands, an activity which depended on junipers for fuel. On the other hand, she also pointed to a potential combination of factors, which included a regional climatic shift toward drier conditions and a decrease in precipitation, attested by the Soreq Cave record among others (cf. 2.5.4).

A number of other sites (cf. **Figure 2.16**) which include paleoenvironmental material can be put forward as examples of the relation between natural vegetation and human exploitation in the Near East in the late 3rd and early 2nd millennium BCE, and add to the subsequent reconstruction of past landscapes in and around the Palmyrene (cf. 2.7). The first to be mentioned is Birket Ram, a Levantine crater lake which has provided botanical information dating to the EBA (cf. Roberts & Reed 2009, pp. 271-272). Pollen analyses from this site suggest that human occupation in the area was episodic, i.e. an ebb and flow of forest clearance for agriculture followed by abandonment and regeneration of this forest. Olive trees were cultivated within the catchment of the lake during the EBA, but these disappeared in the period 2300-2000 BCE, thus around the 4.2 ka BP event, and the catchment area was then recolonised by deciduous oak forest. Although this site does not have a direct spatial association with the Palmyrene, it shows that at least certain Near Eastern woodlands could stay resilient against Bronze Age agricultural practices. The destructive potential in cultivation becomes evident at Birket Ram during Roman times, when human impact on the local environment reached its maximum, crossed the inherent threshold of resilience, and left the surrounding ecologies in a mere semi-natural state.

Another relatively distant area, but more comparable to the drier parts of the Palmyrene environments, is the region of Jebel al Arab in southern Syria. Today this is a barren desert filled with scattered volcanic rocks (**Figure 2.17**), but charcoal analyses carried out on samples from the site of Umbashi strongly suggest that during the EBA and MBA, the landscape looked quite different (cf. Willcox 1999, pp. 712-715). It is located c. 15 km east of the modern 100 mm isohyet line in an area called the *Black Desert*, but paleoenvironmental research has shown that during the EBA it was home to a type of woodland steppe, including tree and grass species now only associated with the isolated remnants of such vegetation hidden away in sheltered parts of the Near East. In archaeological assemblages of this date numerous examples of *Quercus* (deciduous), *Pistacia*, *Tamarix*, and *Amygdalus* have been recovered, as well as other species constituting part of the woodland steppe biome (cf. 2.7.1). Although different, the MBA seems also to have harboured a much lusher environment at Umbashi than today, albeit with lesser amounts of *Quercus*, *Tamarix*, *Pistacia*, and *Amygdalus*, but a lot more *Chenopodiaceae*. However, interestingly the amount of olive trees

(*Olea*) increased sevenfold by the early part of the 2nd millennium BCE. The reasons for these developments were probably complex, and may have incorporated aspects of vegetational degradation in the immediate surroundings – indicated by the massive increase in olive cultivation – but as with other parts of the Near East, climate change has been convincingly evoked as a major factor for the changing landscape from the EBA to the MBA. Other potential culprits could have been economic changes resulting higher mobility and increased grazing, or merely variations in wood use preference affecting the on-site paleobotanical corpus. Of course, all of these explanations may have been in play at the same time, with interrelating cause-and-effect patterns, but the main point inferred from Umbashi is that the Bronze Age landscapes often looked vastly different that the ones we experience today, even in such an arid region.


**Figure 2.17:** Satellite image of the region surrounding the site of Umbashi in southern Syria. Although the area seems utterly barren and devoid of larger species of vegetation today, archaeological assemblages suggest an ecology more akin to the terebinth/almond woodland steppe during both the EBA and the MBA. The large black geological structure is the now extinct volcanic field of Tulul es-Safa.

The final examples of archaeological sites which will be discussed in the context of EBA-MBA environments in a diachronic perspective are situated in the Euphrates and the Habur river valleys. Deckers and Pessin (2010, pp. 222-224) studied a number of sites in north-central and northeastern Syria and analysed 51.000 charcoal samples from associated archaeological assemblages. The most relevant ones for the present study were Tell Meskene (ancient Emar) in the Euphrates bend and the site of Tell Sheikh Hamad on the lower Habur (cf. **Figure 2.16**). Their main aim was to study the relative spread of *Pistacia-Amygdalus* vegetation vs. *Quercus* in through the Bronze Age to use as a climate proxy, with the former species indicative of arid periods and the latter expanding in moister climates. They also looked at *Populus-Salix* vs. *Tamarix* ratios from the sites, which can give an impression of the human impact in such riverine environments. Their results indicated that the period c. 2200-2000 BCE was characterised by steppe woodland with less pronounced parkland appearance than earlier in the 3rd millennium BCE, while data from Tell Meskene suggested that the climate in this period was drier than during the following centuries, i.e. the MBA. On a longer scale, a development characterised by an increase in *Pistacia* relative to *Quercus* was attested in the material, evidence for a general drying trend into the LBA, which in fact seemed to experience even more arid conditions than today. This development was by the authors linked to the 4.2 ka BP event (cf. 2.5).

Based on these examples from archaeological sites a preliminary conclusion could be argued to support a picture of relatively natural landscapes across large parts of the Near East, presumably at least outside the Mesopotamian alluvium, during the EBA and MBA, but the presence of large settlements would have had a potential for some impact on their immediate surrounding ecologies. Although I feel disinclined to advocate from an extreme ecologist perspective (cf. 2.6.1), the balance of evidence still seems tipped in favour of vastly different steppe environments compared to the ones experienced today, particularly with regard to trees and the amount of vegetation in general. Some areas do attest to a visible amount of environmental deterioration during the 1st millennium BCE, with further effects in the Classical period. Nevertheless, in a discussion concerning the EBA-MBA Palmyrene, as well as for most of the Jezire, it seems defensible to assume that natural steppe vegetation was covering large swathes of it. The final part of this chapter will present in general terms what these natural ecologies would have entailed for the various landscapes relevant here.

## 2.7 The reconstruction of Palmyrene environments

While present-day environments cannot simply be projected onto the past, and reconstructions need to be based on a variety of sources, proper knowledge of the compositions of natural vegetation is still indispensable in this respect (van Zeist & Bottema 1991, p. 16). In their study of the Epipaleolithic and Neolithic site Abu Hureyrah, Moore et al. (2000, pp. 49-50, with references) reconstructed the ecological potential of the various Syrian biomes, and projected a picture of how the landscape would have been under the current climatic conditions, but without any human intervention. Such an approach could provide a perspective of past environments which is lacking from the degraded modern landscape (cf. 2.3). It is clearly necessary to be cautious, as the recent data does not necessarily reflect the ecological complexity of a more distant past, e.g. due to the potential of migratory species replacing certain original populations (Moore et al. 2000, p. 51). However, this aspect would also be more relevant on a detailed and species-specific level, and not in a broad overview. Even though climatic variations and human exploitation probably did affect parts of the Near East already by the Bronze Age, Syrian environments were of much richer quantity and quality than it is today, and the region was still covered in much more extensive woodlands even by the end of the LBA (cf. Deckers & Pessin 2010, p. 225).

Although the Abu Hureyrah research focused upon much earlier periods than the EBA-MBA focus here, their ecological perspective corresponds quite well. The site itself is also located in relative proximity to the Palmyrene and their temporal focus would in fact not be too much of a hindrance for this discussion, due to the fact that their environmental reconstructions were based on the *modern* climatic regime. They defined seven different biomes, which in some ways parallel the ones found in Wirth (1971) (cf. 2.3.2, 2.3.3, and 2.3.4), and some of which were divided one step further (e.g. 5a and 5b). The Palmyrene incorporates several of these ecological zones, but mainly the terebinth/almond woodland steppe (biome 4), moist and medium-dry steppe (biome 5a), and very dry steppe (biome 5b). The western borders of the Palmyrene, as well as northern parts of the Jezire could also have supported parkland vegetation of oak and rosacaea (biome 3b), while the southeast on the opposite end of the scale in would only have had potential for desert vegetation (biome 6). Finally, gallery forest of riverine vegetation (biome 7) would have lined the main river valleys of Syria and the Euphrates in particular (cf. Moore et al. 2000, p. 50, fig. 3.7 – also cf. **Figure 2.18**). I will conclude this chapter with a short presentation of these potential biomes, mainly based on the work of Moore et al. (2000), as a core contextualisation of the Palmyrene environment, as well as considering them in light of the other aspects discussed here, especially in relation to diachronic climatic variations and the significance for human habitation and exploitation.

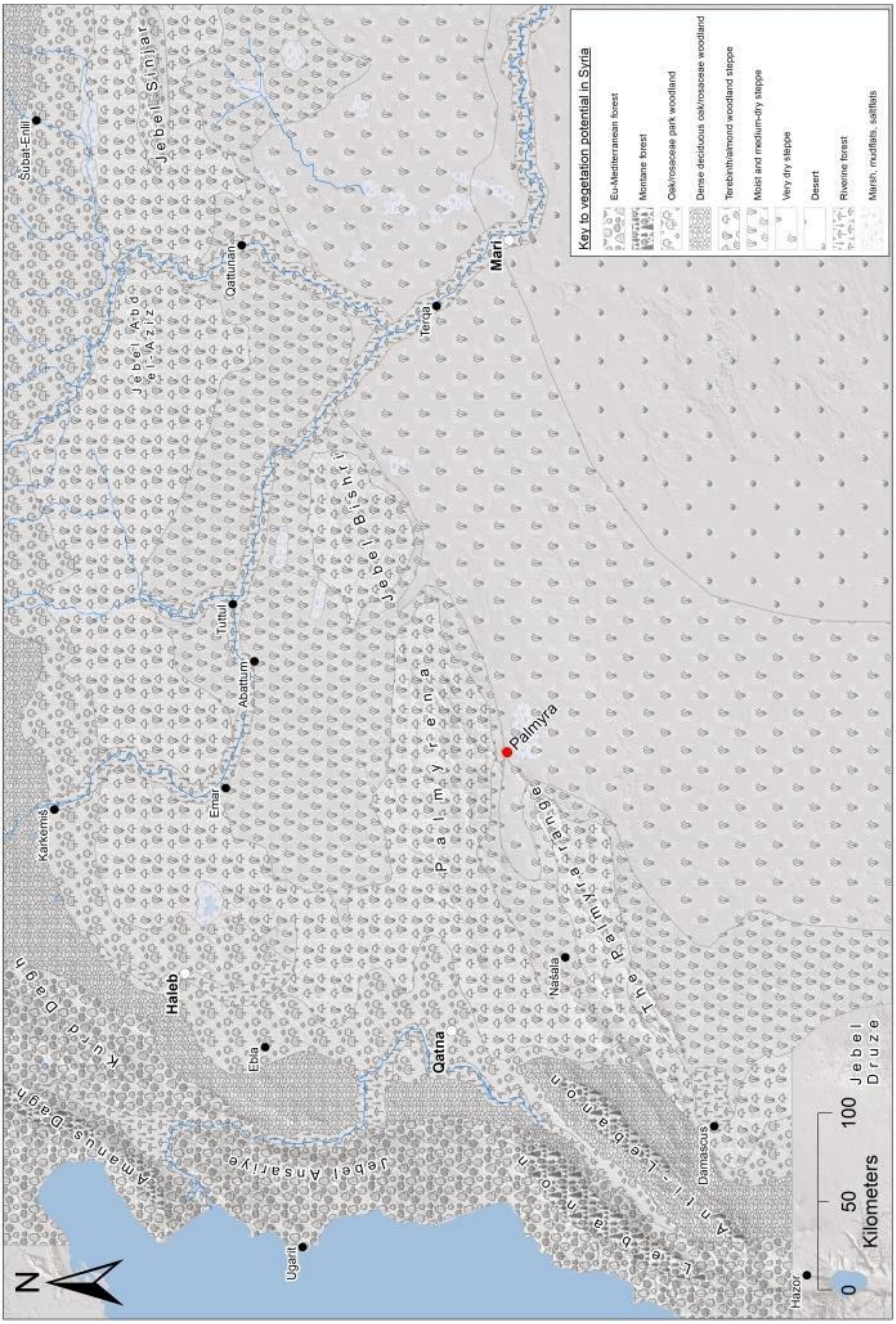

Key to vegetation potential in Syria
Eu-Mediterranean forest
Montane forest
Oak/rosaceae park woodland
Dense deciduous oak/rosaceae woodland
Terebinth/almond woodland steppe
Moist and medium-dry steppe
Very dry steppe
Desert
Riverine forest
Marsh, mudflats, saltflats
Šubat-Enlil
Jebel Sinjar
Jebel Abd el-Aziz
Qattunan
Mari
Terqa
Jebel Bishri
Tuttul
Abattum
Palmyra
Emar
Karkemiš
Palmyrena
The Palmyrene range
Haleb
Našala
Ebla
Qatna
Kurd Dagh
Amanus Dagh
Jebel Ansariye
Lebanon
Anti-Lebanon
Damascus
Jebel Druze
Ugarit
Hazor
0 50 100
Kilometers
N

**Figure 2.18 (previous page):** The vegetation potential of Syrian environments under the modern climatic regime with Bronze Age settlements and geographic regions marked. The legend is inlaid and should be viewed as indicative of the main ecologies in their respective areas, with some degree of variation within each. Map reproduced after Moore et al. 2000, p. 50, fig. 3.7.

### 2.7.1 Palmyrene terebinth/almond woodland steppe

Most of the Palmyrene highlands would originally have consisted of terebinth/almond woodland steppe ecology, and this zone therefore constitutes the primary environmental context for the EBA-MBA mobile groups of this region and their potential archaeological remains (cf. chapters 5 and 4, respectively). The region receives too little precipitation to support oak groves today, but more drought-resistant species could thrive there. In addition, geological and hydrological factors affect the potential of this biome, and consequently regions with less favourable conditions, like the southern slopes of Jebel Abd el-Aziz (cf. **Figure 2.1**), would need slightly higher annual precipitation for such vegetation. Yet other landscapes have more advantageous combinations of factors, and can thus support this ecology on less than 200 mm annual rainfall. Interestingly, the Palmyrene was emphasised as precisely such a favourable area for the terebinth/almond woodland steppe by Moore et al. (2000, p. 60), as well as the regional potential for this biome forming a broad zone, except under particularly unfavourable topographical or hydrological conditions.

Most of this biome contains plants of an Irano-Turanian vegetation type, although with a distinct phytogeographical Syrian entity, dominated by species of *Pistacio* and *Amygdalus*. Particularly the terebinth trees *P. atlantica* and *P. khinjuk* would have been characteristic (Moore et al. 2000, p. 62), and these species are in fact indicators of steppe vegetation and relatively arid conditions in analyses of archaeological assemblages (cf. 2.6.2). Terebinths are still found on isolated ridges and mountain slopes of central Syria, but large tracts of them were described to grow in the Palmyrene highlands, e.g. specifically along Jebel Abyad and Jebel Merah, by Musil (1928, pp. 147, 149) in his travel accounts from the early 20$^{th}$ century CE (also cf. Zohary 1973, p. 168). Other anecdotal evidence from the 17$^{th}$-19$^{th}$ century CE Palmyrene describe thick and shady turpentine trees covering both sides of Abu Rujmein, as well as one noting this range covered by a considerable forest. An account provided by the grandfather of Khaled Assad at the Palmyra museum supports such a picture, as he described woodland in Jebel Abyad and adjacent ranges in places being too dense to traverse with a camel (cf. Moore et al. 2000, p. 62, with references). Jebel Abyad has been extensively surveyed by the Palmyrena project (cf. 4.2.3.1), and it is not an overstatement to say that it is completely devoid of trees, apart from at the most a handful of isolated terebinths (**Figure 2.19** – also cf. **Figure 4.28**). More recently, Zohary (1973, p. 586) mentioned seeing steppe woodland in Jebel Mqeibara, a range lining the north side of Tulul al Bayda (cf. **Figure 4.26**, no. 6) on the route between Suhne and Taïbe, including the species *P. khinjuk*, *Prunus microcarpa*, and *Rhamnus palaestinus* (see below), a type of biome similar to vegetation found in the Zagros, but without oak. However, once more, satellite images of these mountains show them to be wholly barren. Further east, Jebel Sinjar still supported oak groves of the type *Q. brantii* in the 1960s in addition to the abovementioned species (Zohary 1973, p. 586), but this region also receives slightly higher rainfall than the Palmyrene (cf. **Figure 2.6**).

**Figure 2.19:** An isolated terebinth found sheltering under a cliff high up on a Jebel Abyad mountain slope during the fieldwork of 2011. This was one of a mere handful of such trees found to inhabit this range that season (for the other cf. **Figure 4.28**), and may have survived due to its relatively inaccessible location.

Other large species of vegetation in this biome would originally have included almond trees and shrubs (*Amygdalus communis* and many other subspecies), hawthorns (e.g. *Crataegus flava* – the yellow-fruited hawthorn), and wild pear trees (*Pyrus* spp.). Smaller shrub types would e.g. have included buckthorns (*Rhamnus palaestinus*), dwarf cherries (*Prunus fruticosa*), and capers (*Capparis* spp.). Numerous species of grasses and herbs would have thrived, most notably various genera of chenopods (*Chenopodioideae*), wormwood (*Artemisia*), and tall, perennial feather grass species (*Stipa*). However, it seems probable that the microclimates provided by trees could have harboured an even richer composition of undergrowth in this environment, including swathes of wild wheat and rye, particularly in ecological hot-spots (cf. **Figure 2.7**). Moister parts of the terebinth/almond woodlands could even have harboured extensive and dense stands of einkorn (*Triticum urartu*) and especially wild barley (*Hordeum spontaneum*), while other exploitable plants would have included lentils and geophytes (cf. Moore et al. 2000, pp. 62-63). This landscape could under modern climatic conditions have dominated the Palmyrene highlands (cf. **Figure 2.2**), from Jebel Bilas through Abu Rujmein and Jebel Dahek, as well as the entire Jebel Bishri. Lower-lying parts within and between these mountain ranges would in places perhaps have had ecologies closer to those of the dry steppe biomes (cf. 2.7.2), as would the steppe that stretching toward the Euphrates north of the Palmyrene ranges (cf. **Figure 2.18**). For the Near East in general, the terebinth/almond woodlands would have characterised most of the northern Jezire from the Jabbul plain to the Tigris.

### 2.7.2 Palmyrene dry steppe – moist to medium dry and very dry types

The dry steppe would mainly have been populated by grasses, herbacious plants and, chenopods, and stretched out in a largely unbroken pattern between the woodland steppe and desert biomes (2.7.3). However, this is clearly a simplification which does not do justice to such a vast region, and variations within the zone would have occurred with vegetation depending on local ecological qualities. This zone can in general terms be divided into two types – moist to medium dry steppe and very dry steppe (cf. Moore et al. 2000, p. 50, fig. 3.7).

Vegetation in the dry steppe would have included many species of wormwoods and chenopods (cf. 2.7.1), but the potential of this biome also suggests that grass species of various heights would have been ubiquitous. Without heavy grazing, even the drier parts of this zone would have included grass swards (Moore et al. 2000, pp. 63-64). Tall grasses, both perennial and annual, of genera like *Poa* and *Stipa* would have covered this biome, extending as a grass sea across the region, although in reality kept partly in check as pastures (**Figure 2.20**). Even in recent times, areas supporting such ecology in which grazing has been limited or forbidden, can in fact be covered in chest-high *Stipa* species, rendering the two other characteristic genera (*Artemisia* and *Chenopodioideae*) invisible. One description of the route between Aleppo and Baghdad dating to the 17th century CE also suggests this was the case in more remote areas of the Near East, even though pastoralism and seasonal grazing at this time constituted a substantial part of the regional economy (cf. Moore et al. 2000, pp. 64-65, with references). Another account from the 19th century CE observed clover growing as high as up to the knees of the horses along the route between Aleppo and Taïbe, an area of regular grazing (cf. Moore et al. 2000, p. 66, with references). Even with rainfall as low as 100 mm annually would have been sufficient for an abundance of *Stipa* species, as the Abu Hureyrah project found to be the case for isolated and remote islands of vegetation. Such environments would also have been rich in *Artemisia* species and numerous types of chenopods, as well as certain herbs, like sage (*Salvia cryptantha*) and thyme (*Thymus squarrosus*), and many other small plants (cf. Moore et al. 2000, pp. 65-68). The very dry steppe, like parts of the Al-Hamad (cf. **Figure 2.1**), would have had a cover of chenopods and species of *Poa* and *Stipa*, albeit not growing as lushly as in the moister zones and gradually declining toward the desert zones.

**Figure 2.20:** Picture from the Palmyrene, with various grasses growing lushly after winter rains. While this may be more or less how the dry steppe biome could seem in spring, the photo is somewhat misleading, as it in fact

was taken in an area which probably once supported a terebinth/almond woodland biome. However, this landscape had been reduced to an environment more similar to a dry steppe type (photo: Jørgen Christian Meyer).

The moist and medium dry but largely treeless steppes of the Near East would have been situated between the zones of terebinth/almond woodland and the very dry steppe. More specifically, it would have dominated the southern half of the Western Jezire (i.e. between Habur and Balih – cf. **Figure 2.1**) and the northern Palmyrene up to the Euphrates. The region due east of Damascus could also have supported the moister type of steppe, but the Al-Hamad would in general be characterised as very dry steppe, as would the southern half of Eastern Jezire across to the Tigris (cf. **Figure 2.18**). However, even this vegetation would have been vastly richer in quantity and quality than that now found along the south side of the modern road between Tadmor and Deir ez-Zor, and probably more so than the current vegetation cover in much of the Palmyrene itself. These biomes (i.e. 2.7.1 and 2.7.2) would have constituted the main environments the Palmyrene and most of the Jezire. I will also briefly describe three other types of ecologies found around these regions, as they may have come into play in central Syria depending on climatic developments, as well as forming a comparative perspective in relation to the degraded biomes described above (cf. 2.3).

### 2.7.3 The desert biome

The desert ecology would have included the region south of the Euphrates around the point where the river enters Iraq, i.e. just south of Mari (cf. **Figure 2.18**). It can be defined as different compared to the steppe biomes, in that it does not have a continuous root system and consequently does not allow soil cover. The desert supports few or none *Artemisia* or grass types, only shrubby chenopods, and the vegetation found there is mainly growing in patches of isolated populations established where local topographical or hydrological conditions could allow a thin soil cover (Moore et al. 2000, p. 69). Arguably, many parts of central Syria today could thus be appropriate to group in with desert biomes, although they until recently were firmly characterised as steppes.

### 2.7.4 Riverine biomes

The large river valleys of Syria – the Euphrates, the Orontes, the Habur, and the Balih – border the Palmyrene on three sides. These landscapes have been reconstructed based upon better preserved stretches of riverine forest in Turkey (cf. Moore et al. 2000, pp. 69-73). The

Euphrates valley would in places have been dominated by up to 30 m tall oriental planes (*Platanus orientalis*), which had dense canopies and thus would have provided lots of shade for the undergrowth. Closer to the rivers, these would have given way to poplars (e.g. *Populus euphratica*), ash trees (*Fraxinus rotundifolius*), and occasional elms (*Ulmus* spp.), all of which certainly grew along the Euphrates and may have been found along stretches of the other rivers as well. Imprenetable thickets of tamarisk (*Tamarix gallica*) and willows (*Salix* spp.) would have bordered the river banks. Reeds, water lilies, and other aquatic plants would have thrived in the rivers themselves, as would shrubs and grasses on dry land, growing in between trees and in transitional areas between the biomes. Several of the taxa above have been used in environmental studies as main indicators for riverine forests (e.g. Deckers & Pessin 2010, p. 217). Of the species mentioned here, only the tamarisk is still found in extensive populations along the rivers, as it can endure saline environments that would kill most other plants (Cech 2005, p. 122).

### 2.7.5 Xeric woodlands on the Palmyrene periphery

Although there is some debate regarding the borders of the steppe vs. that of the moister xeric woodlands in the Near East (e.g. Zohary 1973; van Zeist & Bottema 1991; Moore et al. 2000), the latter zone seems to require c. 300 mm annual precipitation, but also the right soil structure and geology (Moore et al. 2000, pp. 53-54). The main difference of this zone from the woodland steppe in vegetational terms is the presence of extensive oak populations (*Quercus* spp.), although species found in the steppe would also have been growing there, e.g. *Crataegus, Pyrus,* and *Pistacia* spp., as would juniper shrubs and smaller trees, while the density of the vegetation would constitute a further difference between these biomes. West and northwest of the Palmyrene, on the plains around Homs and Aleppo, the landscape would have been characterised by such park-like woodland, i.e. an extensive and relatively dense scatter of oaks and other trees interspersed with grassland. Taxa such as *Q. boissieri*, and the drought-tolerant *Q. brantii* (also cf. 2.7.1), would have thrived in such an open woodland, in addition to the terebinth/almond genera mentioned above. Perennial and annual grass genera (*Bromus*, *Avena*, *Hordeum*, *Secale,* and *Agropyrom*) and cereals (e.g. einkorn, rye, and oats) would have constituted parts of the ecological diversity within the grassland component. The steppe species *Stipa* and *Artemisia* would also have been naturally incorporated into this biome, although as smaller populations (Moore et al. 2000, pp. 54-56).

### 2.7.6 Regional fauna

The last part of this contextual presentation of the Bronze Age environments of Syria concerns the fauna, which was very much more diverse than the current one (cf. Wirth 1971, pp. 128, 134-135; Moore et al. 2000, pp. 85-91; Deckers & Pessin 2010, p. 224). The steppes and woodland steppe biomes of the Palmyrene highlands would have been populated by various species of mammal, most notably three taxa of southwest Asian gazelles (*Gazella gazella*, *G. dorcas*, and *G. subgutturosa*) and the onager (*Equus hemionus*), animals gathering and migrating in large flocks which may have been subject to mass hunts by mobile groups utilizing the many kites now found littered across the region (cf. 4.5.5 for a discussion on these practices). Other steppe species would have included wolves (*Canis lupus*), jackals (*Canis aureus*), hyenas (*Hyaena hyaena*), foxes (*Vulpes vulpes*), and hares (*Lepus* capensis). Although all these are still present in the Syrian fauna, their numbers have been greatly diminished in the last century (cf. 4.5.5). Predatory animals which would have been inhabited the Bronze Age wilderness, but now are either almost or indeed fully extinct, were Syrian brown bears (*Ursus arctos syriacus*), panthers (*Panthera pardus*), lynx (*Lynx lynx*), and Asian lions (*Panthera leo persica*). One text from ancient Mari show that the latter could present a real threat, as two lions had made their lair in the hedge near the city gate and they were threatening workers on their way to work the fields outside the city. One of the lions were eventually killed and the other chased off by members of a mobile group, who were presumably more used to such hazards (cf. Heimpel 2003, pp. 217-218, text **26 106**). But lions survived in the Euphrates valley until the late 1800s as they also feature in several travel accounts from the 17$^{th}$-19$^{th}$ centuries CE (e.g. Blunt 1879a, pp. 77-79; cf. Moore et al. 2000, p. 90), while panthers and lynx may have roamed the region even until the interwar years (Wirth 1971, p. 128). In the dry steppe and the desert environments, animals like oryx (*Oryx leucoryx*), hartebeest (*Alcephalus buselaphus*), and ostriches (*Struthio camelus syriacus*) were found until the late 19$^{th}$ and early 20$^{th}$ century CE, and the latter are frequently mentioned in texts from the Mari archives (cf. 5.2.1.4). Riverine forests and the biomes on their fringes harboured large numbers of wild boars (*Sus scrofa*) at least up until the First World War (cf. Blunt 1879a, p. 78), and some river valleys in the Near East also had fallow deer (*Dama mesopotamica*) and beavers (*Castor fiber*) (Moore et al. 2000, pp. 86-90). Finally, during the Bronze Age, even extinct mammals like the Syrian elephant (*Elephas maximus asurus*) and notably the auroch (*Bos primigenius*) were found, the former in riverine forests at least along the Orontes and the latter in numbers on the steppes of the Jezire and presumably also the Palmyrene, attested by several Mari texts mentioning hunts and encounters with aurochsen (cf. 5.2.1.4). Thus, it is conclusively clear that the landscape and environment that is evident in Syria today would have been very different compared to the flora and fauna experienced during the 3rd and 2nd millennium BCE by both mobile pastoralists and their more sedentary neighbours.

### 2.7.7 Considerations of the biome potentials in a Bronze Age context

The biomes described here (2.7) represent as mentioned the potential of the various parts of the Near East under modern climatic conditions, but fully without any exploitation by human societies, such as seasonal pastoralism or cultivation. It is clear that some areas at the very least would have had environments altered and transformed into cultural landscapes. While this process may have started even before the Bronze Age and continued to shift the boundaries between natural and cultural landscapes throughout the history of human occupation in the region, the degree to which this may have pushed the environment across a threshold of resilience already in the EBA or MBA is difficult to encompass. Optimal ecological conditions such as those characterised above would probably not have been found in densely settled parts of the Near East, e.g. on the alluvium, in the Habur triangle, or along the Orontes (cf. **Figure 2.1**). Villages, towns, and cities would have had an inherent potential for environmental degradation, and some may even have crossed the line between moderate land uses and enacted a more unsustainable exploitation on the landscapes, particularly near regional centres. However, it seems reasonable to assume that this impact would quickly diminish with distance and that many of the biomes experienced only a limited form of exploitation which with time regenerated back into a more or less natural state. An important factor when considering interactions between human populations and the environment is the aspect of seasonality. Mari texts attest to the dangers posed to travellers in the dry steppe during some months of the year – especially with regard to water supplies (cf. texts **3.4**, **3.5**, and **5.6**). But this does not suggest that the steppe already at that point was a degraded biome like today, a notion also supported by the many travel accounts published in the last two centuries. Seasonality is of course also essential in any discussion concerning Near Eastern mobile pastoralists, also those forming parts of Bronze Age societies (cf. Traboulsi 1991, p. 47), a topic which will be dealt with later (cf. 5.1.3 and 5.2.1). In this respect it should be emphasised that while flocks of sheep and goats can make their mark on the vegetation in an area by stripping shrubs for leaves or ripping out grass with its roots (e.g. cf. Pignatti 1983, p. 157, fig. 6), Near Eastern mobile pastoralists seem to have been part of a structure of winter pastures and summer pastures for millennia, thus providing the environment time and opportunity for regeneration. Traditional pastoralism probably also incorporated an in-built balance mechanism as far as interaction with the environment would be concerned due to limitations in technology and transport, and if any threshold of resilience was crossed, it could severely affect both humans and animals (cf. 5.1.3.3). The larger trees in the terebinth/almond woodland would in most cases have been out of reach for domesticated animals, as the camel does not seem to have been domesticated in Syria until after the MBA – although goats could have browsed on the trees to some degree. However, while some may have succumbed to domestic needs for fuel, outside prehistoric industrial use, like smelting, the population would have had to be dense indeed to denude the Palmyrene of trees, a consequence mainly of exploitation under industrial or modern technological and demographic conditions. Thus, in conclusion on this point I would suggest that much of the Syrian steppe would have had profiles like those presented in 2.7.1 and 2.7.2, as would many of the other landscapes shown in **Figure 2.18**, probably excepting those situated in the most densely populated and extensively cultivated areas.

However, as has been shown earlier in this chapter (cf. 2.4 and 2.5), the current climate does not necessarily represent conditions in the past. These clearly fluctuated through the 3$^{rd}$ and 2$^{nd}$ millennium BCE as well, probably causing certain environmental variations with regard to the picture conveyed in **Figure 2.18**. A number of ecological possibilities could have come into play for the period between c. 2400 and c. 1700 BCE, as the climate went from much wetter than the current one, through the 4.2 ka BP event and conditions similar to that of today, and then improving somewhat for a short period in the final two centuries (i.e. MBA II). But this latter phase has also been shown to have been characterised by increased climatic instability, which may also have affected sensitive environments if manifested as more erratic and more violent rainfall. Thus, during the moister period just prior to the 4.2 ka BP event (c. 2500-2300 BCE), comparative data from Soreq Cave (cf. 2.4.2) suggests that the amount of average annual precipitation could have been 100-150 mm higher than at the event nadir, indicated by a drop of c. 0.3-0.6 ‰ in oxygen isotope values, and even higher prior to the mid-3$^{rd}$ millennium BCE. Such favourable conditions could potentially have transformed parts of the terebinth/almond woodlands into a landscape more akin to the drier xeric biome, or extended the woodlands into the moister steppe of the Palmyrene and the Jezire. However, as the 4.2 ka BP event unfolded, the climatic deterioration could have resulted in desert encroachment upon the dry steppe and some reduction in the woodlands in favour of the grassland steppe, although whether climatic conditions at the nadir were similar to the current regime, more arid, or only on the way *toward* modern conditions is not fully clear. The Soreq Cave data, albeit only one source, suggests that even at the lowest point, conditions broadly corresponded to the current ones, and could mean that the Palmyrene landscape was more or less as shown in **Figure 2.18**. In the final century of the EBA (c. 2100-2000 BCE) and in the last two of the MBA (c. 1800-1600 BCE) conditions in the Near East seem to have improved somewhat, with more precipitation than today, possibly having some environmental consequences. However, the novel regime of climatic instabilities may also have prevented recovery of certain biomes, and kept ecologies dominated by more drought-resistant species like terebinth trees, rather than experiencing an expansion of oak populations. Presumably larger trees would also have needed more than these relatively short intervals to firmly establish themselves in otherwise quite dry environments. But it seems highly probable that the conditions and ecological potential found across the region *prior* to the 4.2 ka BP event did not return, and that the late-Holocene Near Eastern aridity we see today had was underway by the end of the period under study here.

## 2.8 Summary and conclusions

This chapter has focused on natural conditions influencing the environments of Syria, which can be quite diversified, mainly according to topography and geography. There are essentially two main seasons in this region. The summer months are generally hot and dry, while during winter months most parts of Syria receive precipitation, although the amount can vary significantly both regionally and on a year-by-year basis. The more arid regions, like the Palmyrene or much of the Jezire, are dependent on hydrological conditions and particularly the amount of rainfall these biomes receive for a thriving ecology, and the nature of their vegetation cover is therefore highly seasonal. Originally, larger plant species would still mostly have survived the dry season, with the winter and spring rainfall each year providing conditions for a blooming steppe vegetation. However, it has been argued here that the environment experienced in the central Syrian steppe landscape today is massively degraded due to overexploitation throughout the 20$^{th}$ century CE, resulting in loss of microclimates and subsequent erosion, the latter of which is exacerbated for every heavy rain shower in the area. In addition, not much is left of the original Palmyrene steppe fauna, presumably due to loss of habitat and the general deterioration of the biome. Such a development of ecological ruin could in general be extended to include Syria as whole. The picture seems to have been different during the EBA and MBA, although most studies show a climatic and environmental development from rather moist conditions in the early part of the period in question here (c. 2400 BCE) toward more arid ones in the latter part (c. 1700 BCE). However, the climatic progression was not linear, but took rather the shape of a downward trend of oscillations identified across the Near East – thus probably also affecting the Palmyrene – with a major climatic incident occuring c. 4.2 ka BP, at which point an arid spike in the data is evident in most of the proxy sources. While the climate improved later on in this period, and the region in fact seems to have experienced intervals of relatively advantageous conditions, this particular development signalled the onset of the late-Holocene aridity characteristic of the Near East today. But environmental research also suggests that the Near Eastern ecologies were much richer in quantity and quality during this period, and was arguably not vaguely comparable to the current situation, with a significant amount of tree cover in the steppe highlands and much lusher lowland steppes, in addition to a much better preserved fauna. Thus, the archaeological remains found today across central Syria (cf. 4.1.1) must have been associated with quite a different landscape, and the regional potential for seasonal use of the Palmyrene during the wet season was probably much higher (cf. 5.1.3 and 5.2). However, before turning to these aspects, I will discuss matters regarding the use of ancient texts, as well as presenting a short geopolitical narrative for the EBA IV and the MBA.

# 3 Textual sources and geopolitical developments

Archaeologists work in a context where their own discipline can be augmented by a number of other scientific approaches, but if the temporal focus is set several millennia in the past, more often than not these auxiliary sources of information are confined to the natural sciences – for instance, as in the previous chapter in this dissertation. However, for those studying topics concerning the Near Eastern Bronze Age, a vast amount of information has been – and continues to be – unlocked through historical and epigraphic research. Societies in the region have left us written records ever since the 4$^{th}$ millennium BCE, but the number of texts multiplies greatly in the EBA and onward. Although many critical considerations must be adhered to when reading these documents, some can enhance our understanding of ancient social, economic, or political relations and conditions immeasurably. Such a source of information would be very unwise to reject, even in a mainly archaeological study. Additionally, as this is a synthesis, it is clearly necessary to discuss ancient texts referring to the period in question (c. 2400-1700 BCE), and it will in fact be shown (cf. 5.3 and 5.4) including such a source in the argumentation here could be used to support the interpretations of archaeological structures found in the Palmyrene.

This chapter aims to address aspects surrounding the use of historical and epigraphic sources and present their overarching implications for the period. First, certain issues regarding chronology will be discussed (cf. 3.1), as this has been a recurring problem facing historical reconstructions from the Near Eastern Bronze Age for decades, and I will argue my case for the periodisation in this study. Thereafter, I will consider the sources themselves – the cuneiform tablets and the archives they make up – and briefly note some aspects in light of these sources concerning languages, populations, and the Palmyrene itself in an EBA and MBA historical context (cf. 3.2). Finally, I will conclude the chapter with an overview of historical and geopolitical developments in Syria and Mesopotamia for the period c. 2400-1700 BCE, divided into the EBA (cf. 3.3) and the MBA (cf. 3.4). This part will form the historical backdrop for topics to come, particularly aspects discussed in chapter 5, and its purpose is thus essentially contextual – although as this dissertation is a synthesis, I will also argue for its relevance in isolation.

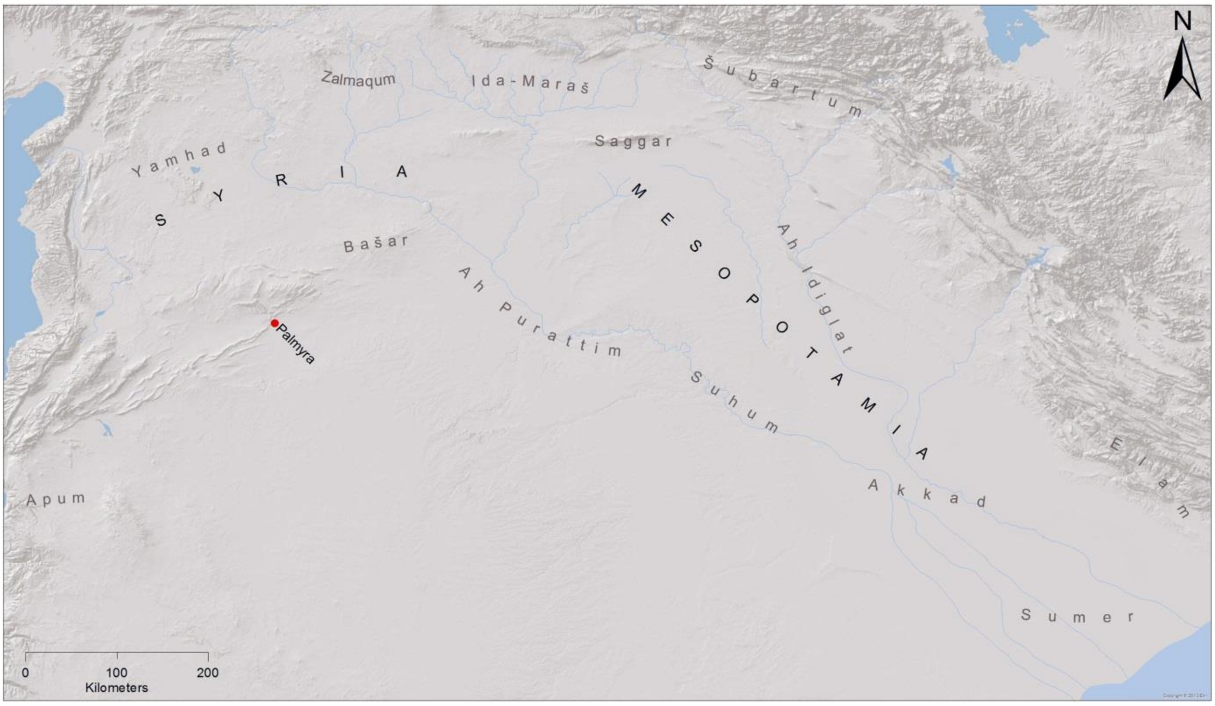



**Figure 3.1:** Regions of the Near East as they often were known during the Bronze Age - obviously apart from Syria and Mesopotamia. The Habur triangle was a conglomerate of petty states called Ida-Maraš, while the Harran area consisted of a few allied Yaminite (cf. 5.3.2.2) states known as Zalmaqum. The Mari heartland as it appeared during the MBA II (cf. 3.4.2.2) was commonly called Ah Purattim ("banks of the Euphrates"), and the region south of this was called Suhum. Jebel Bishri was known as Bašar in the 3rd millennium BCE and the more familiar Bišri during the 2nd millennium BCE, while Jebel Sinjar was known as Saggar (cf. Durand 1991, pp. 85-85, 87).

# 3.1 Chronological considerations

## 3.1.1 Near Eastern chronologies and uncertainties

Near Eastern Bronze Age chronology, while seemingly straightforward, does contain issues of dispute, particularly with regard to accurate dating of historical events. Originally, these derived from chronological charts developed by Brinkman (1977, pp. 335-348), which themselves were based on several sources and assumptions, e.g. king lists, astronomical data, and calendric systems. His resulting regime has, due to the emergence of other alternatives, been known as Middle Chronology (MC) or conventional chronology, and is considered as standard by a majority of scholars working with Bronze Age Near East. However, the widespread, albeit often provisional, adoption of MC has been characterised by some as a result of moderation or indifference (Reade 2001, p. 1) or as a "*convenient compromise"* (Warburton 2007, p. 9), and its basis for MC has also been subject to critical review. While the chronology from c. 1450 BCE is more or less securely fixed via interlocking king lists, for various reasons the picture is more uncertain for the preceding millennium (e.g. Gasche et al. 1998, p. 5; Reade 2001, p. 1). This has led to separate developments of three initial alternatives – High (or Long) (HC), Low (or Short) (LC), and most recently Ultra-Low (or Ultra-Short) Chronology (ULC) (cf. e.g. Warburton 2007, p. 9). The difference in date between these frameworks could be as great as 152 years, with the often used *Fall of Babylon* reference date set at 1651 BCE (HC), 1595 BCE (MC), 1531 BCE (SC), or 1499 BCE (ULC) (e.g. Gasche et al. 1998, pp. 6; 83 – cf. **Table 3.1**). Although archaeological studies often need not concern themselves with variations spanning some decades, the rather wide horizon presented by these chronologies does in my view necessitate closer consideration, especially in a synthetic approach such as this, with its incorporation of radiometrically dated climatic developments and relatively wide use of textual sources.

| **Near Eastern Chronologies** | **HC** | **MC** | **LC** | **ULC** |
|---|---|---|---|---|
| Ur III dynasty | 2161-2054 BCE | 2112-2004 BCE | 2048-1940 BCE | 2018-1911 BCE |
| Hammurabi | 1848-1806 BCE | 1792-1750 BCE | 1728-1686 BCE | 1696-1654 BCE |
| Fall of Mari | 1816 BCE | 1760 BCE | 1696 BCE | 1664 BCE |
| Fall of Babylon | 1651 BCE | 1595 BCE | 1531 BCE | 1499 BCE |

**Table 3.1:** Examples of dates according to the various chronological regimes, calculated from the various dates of the Fall of Babylon reference point. However, the Ur III dynasty LC horizon in this table is slightly lowered from 56 to 50 years higher relative to conventional MC, following the suggestions put forward by Huber et al. (1982, p. 4).

An initial problem stems from periods with which there are few textual sources associated, particularly the so-called *Gutean interregnum* which followed the reign of the last Akkadian king, Šar-kali-šarri (cf. 3.3.2). The duration of this period is in fact unknown, but usually calculated to have lasted between 40 and 100 years (Sallaberger 2007, p. 420), with seemingly higher degree of acceptance for the lower end of this scale (Reade 2001, p. 11). Available radiocarbon dates cannot be used to solve the issue, as results from Mari and Tell Mozan favour the later dates, while results from Tell Brak and Tell Beydar favour the earlier ones (Sallaberger 2007, p. 421), but argued within standard deviations, the whole horizon can probably be supported.

Another problem is associated with the *Venus Tablet (of Ammisaduqa)*, which contains astronomical information on the position of Venus in relation to the horizon and the new moon during the reign of Ammisaduqa of Babylon and provided the basis for the three initial chronologies (i.e. HC, MC, and LC), although it is only known from 7th century BCE texts and later copies (Gasche et al. 1998, p. 6). The text has still been considered as a viable source due to the mathematical precision of the astronomical calendar, where the date of year 1 of Ammisaduqa can be fitted to cycles of 56 or 64 years, initially resulting in a scenario where HC was statistically argued to be the most likely framework (cf. Huber et al. 1982, p. 4; Huber 1987, pp. 6, 16). However, Gasche et al. (1998, p. 72) criticised this approach as inaccurate, as local conditions can influence the observation of Venus. They argued that the only reliable information possible to derive from this tablet is that his year 1 would fall within cycles of 8 years. Two lunar eclipses described in the Ur III source *Enuma Anu Enlil* have added to this argument, resulting in more or less rejection of the HC arguments due to lacking astronomical basis (Gurzadyan 2000). The HC chronology has likewise been viewed as improbable from an archaeological point of view (Warburton 2007, p. 9). In fact, Gasche et al. (1998) approached the issue by looking at the archaeological evidence rather than the textual, and compared typological developments in pottery. They concluded that the *Fall of Babylon* date actually should be placed around 1500 BCE. Corroborating through studies of astronomical information, the Assyrian King List (AKL), and the integration of variations in reigns and certain ancient calendric issues, they arrived at the date 1499 BCE for this event – the reference point of a framework now commonly known as the ULC. Although they neither rejected the MC nor the LC, they nevertheless suggested that the evidence pointed to a chronology *lower* than the conventional MC (Gasche et al. 1998, p. 76).

Reade (2001) studied the AKL with the aim of coming up with a *Fall of Babylon* date independent of the Venus tablet or the Ur III eclipses, although at the outset he emphasised that the result should not be considered conclusive due to the concept of *Distanzangaben* – that is, time-spans mentioned in other texts between Šamši-Addu and later kings (Reade 2001, p. 3). His arguments were based on time elapsed between the erection of the Aššur temple and later reconstructions of the building during the LBA, and incorporated a number of generally accepted assumptions and calculations necessitated by gaps and uncertainties in the AKL (Reade 2001, pp. 3-7). He concluded from this research that 1680 BCE would be the "*least unlikely option*" for the death of Šamši-Addu (Reade 2001, p. 8). The *Fall of Babylon* date according to this regime would be 1499 BCE, and he pointed out the striking parallel to the conclusions in Gasche et al. (1998), with both seemingly arriving at this date via independent data sources (Reade 2001, pp. 9-10). Yet another astronomical event applied in the search for absolute historical chronology is a textual reference from the MBA mentioning a solar eclipse associated with the birth of Šamši-Addu (cf. 3.4.2.2), but of the potential eclipses occurring in the area in the relevant period, none can provide a conclusive solution to the problem. They can fit all scenarios apart from HC, and attempts to anchor one framework without any additional information is considered too uncertain (Gurzadyan 2003, p. 5). While this event has still been used to support one framework or the other (e.g. ULC in Warburton 2007, p. 12), as well as proposed variations to the current MC by lowering it 8 or 16 years, accordance with 8-year cycles (Sallaberger 2007, p. 419; De Jong 2013, p. 159), Schwartz (2008, p. 452) cautioned against its use due to the propagandistic intentions of the associated text. However, it is regularly argued that in fact very few scholars possess sufficient knowledge with regard to both cuneiform texts and astronomical data to be able to fully understand and discuss the integration of these aspects (Reade 2001, p. 9).

Several attempts to resolve the issue have taken place through international and interdisciplinary colloquiums and workshops (e.g. Åström 1987; Matthiae 2007), but there is still no conclusive evidence in favour of one chronology over the other (Schwartz 2008, p. 452). However, there seems at least to be wide scholarly consensus among archaeologists that MC or lower are the most probable scenarios. Radiometric and dendrochronological dating methods have been applied in an effort to provide higher probabilities for one alternative or the other. At Acemhöyük in Anatolia, dendrochronological samples from wall footings of a room in the Sarıkaya Palace associated with seals of Šamši-Addu has yielded a date of 1752+76/-22 BCE for the felling of the trees (Kuniholm et al. 1996, pp. 780-782). This would seemingly be the death blow to the HC framework as this date falls after Šamši-Addu's death according to HC, although with standard deviations it still falls well within his reign according to MC. Contextual questions regarding this date have been raised, most notably the uncertainty of a direct temporal relation between these seals and the beams (Gasche et al. 1998, pp. 10-11; Collon 2007), in addition to dendrochronological considerations regarding felling date and building timber, as well as the possibility of timbers having been used for repairs (Reade 2001, p. 10). Contrary to the possibilities of dendrochronology, radiocarbon dates would normally not provide the fine-meshed results necessary to resolve the question of absolute chronology. However, radiocarbon dates associated with the destruction of Ebla have been argued to favour, with almost no exception, the MC and not the ULC regarding the fall of Babylon and Aleppo, although the argument was followed by an emphasis on caution against any bold conclusions on the issue (cf. Matthiae 2007, pp. 23-24).

Manning et al. (2001) and the Aegean Dendrochronology project used a high-precision method to refine $^{14}C$ dates from major Bronze and Iron Age archaeological sites in Anatolia. Their results would narrow the standard deviation of dates down to a mere +4/-7 years and could thus have major implications for the use of tree ring chronology in the region. According to the authors, the Sarıkaya Palace at Acemhöyük (see above) would now be dated to 1774 +4/-7 BCE, while the Waršama Palace at Kültepe (Kaneš) would be dated to 1832 +4/-7 BCE, securing the *terminus post quem* of the seals of Šamši-Addu, as well as providing a link between this ruler and the dated Waršama Palace layer. However, the only framework which fit with these dates is the MC, although a slightly lowered MC could also provide a match. HC would be ruled out, while the LC and ULC are considered unlikely and very unlikely respectively due to contextual reasons with regard to preceding phases (Manning et al. 2001, p. 2534). The results and implications have not gone unheeded, and particularly Keenan (e.g. 2002; 2006) criticised their validity on a number of points: a) the Mediterranean supposedly released more $CO^2$ into the atmosphere prior to mid-2$^{nd}$ millennium BCE, b) certain statistical issues in the study lead to questionable analyses, c) the tree ring sequences were obtained from several species of trees, which all could have included varying tree ring growth processes, and d) the Anatolian dendrochronology is floating, meaning it contains gaps (cf. Keenan 2002, pp. 231-232). He finally argued that dendrochronologists are so few and far between that:

"*The result is a system in which investigators can claim any plausible results and are accountable to no one. Archaeologists should not submit to this system. There might be temptation to accept a tree-ring date without supporting measurements, particularly when the date agrees with the archaeologists' hypotheses. To accept such a date, however, implies acquiescence to a system that does not have sufficient checks to insure its integrity*" (Keenan 2006, p. 16).

There is definitively an inherent risk in accepting and integrating data and research results from other scientific disciplines often applied by archaeologists in their studies as non-specialists, but the character of our discipline commonly necessitate interdisciplinary approaches. Thus, at least when it comes to submitted and accepted papers in *bona fide* scientific journals, one has to assume that the research has been carried out in a scrutinised manner (also cf. 3.2.1). Manning et al. (2010) did not address all these supposed short-comings, but they rejected the evidence for depletion of $^{14}$C levels in the region.

Finally, I will briefly consider how archaeological studies have focused on adding to the issue of absolute chronology in the Bronze Age Near East. Like the case can be made for $^{14}$C dating, typologies cannot normally provide definitive answers, but it may be possible to eke out some tentative conclusions. Gasche et al. (1998) used pottery typology to arrive at their ULC framework, and recent typological studies of Syrian pottery compared to typologies from the Levant and Mesopotamia also concluded that a lower chronology than MC would in fact fit better with that particular archaeological material (Bietak 2007, p. 122; Pruss 2007). Presently, a MC framework would imply that certain ceramic techniques took 100-200 years to spread from Mesopotamia to Syria, although it is rightly emphasised by the author that it would be hazardous to conclude anything definitive from the study of a single decorative feature on one cultural element, in this case pottery (Pruss 2007, pp. 485-486). Indeed, there could be many factors behind the spread of cultural features.

Evidently, the mere inconclusiveness of the arguments provides me with a conundrum. Some data support the conventional MC, some data would necessitate minor tweaks, while others support a chronological framework dated a full century lower. The independent conclusions of Gasche et al. (1998) and Reade (2001), supported by patterns in pottery typologies make the ULC a seemingly viable option, and in principal I do partly agree Reade (2001, p. 2) when he argued that "[MC] *having won uncritical acceptance, it is doing more harm than good"*. There is always a point in reconsidering an issue as uncertain as the Near Eastern absolute chronology of the EBA and MBA when studies of a wide horizon of archaeological and historical topics rely heavily on the temporal aspect. However, I find the arguments for HC unconvincing and the arguments for the specific LC few and far between and will therefore leave these aside in this provisional conclusion. In light of all the inherent tentativeness of the debate, it is difficult to leave MC behind and adopt and operate with a whole new set of dates.

Particularly the research presented by Manning et al. (2001; 2010) – although criticised by Keenan (2002; 2006) – provides convincing arguments for the MC in some form. A recent reappraisal and fine-tuning by De Jong (2013) based on a combination of the Waršama dendrochronology results, ancient calendrical issues, and the astronomical events (see above) concluded that what he termed Low Middle Chronology, i.e. MC only eight years lowered, most probably was the correct framework for the MBA – meaning that conventional MC in fact has been an excellent chronological fundament on which to base Near Eastern research during the last 50 years (cf. De Jong 2013, pp. 160-161). Thus, although seem to be some ambiguities associated with the MC vs. the ULC, and certain shortcomings for researchers having to integrate overarching and possibly incompatible elements from the Levant to Mesopotamia (cf. Warburton 2007, p. 10), it still works in a study mostly concerned with Syria proper from late EBA to MBA. While the most recent investigation suggests lowering it by eight years, in this predominantly archaeological dissertation, such a minor alteration would merely be inconvenient and potentially confusing. Therefore, keeping in mind that it is a compromise and a convenience, but also associated with rather firm arguments, I will carry on this study following conventional MC, where the Ur III dynasty ended c. 2000 BCE, Mari was destroyed 1760 BCE, and the *Fall of Babylon* occurred at 1595 BCE – and all dates here will be used according to this original framework.

### 3.1.2 Periodisation in Near Eastern archaeology

The Near Eastern Bronze Age is associated with a number of relative, cultural, and regional terminological variations referring to archaeological periods. In the case of Syria, the many synchronisations with Anatolia, Upper and Lower Mesopotamia, and the Levant necessitate a knowledge and integration of cultural concepts such as the Akkadian period, the Old Assyrian period, as well as the more temporally based Bronze Age periods. Following the MC (cf. 3.1.1), I will here briefly present the most important synchronisms and my own choice of relative chronology and periodisation.

During the 20$^{th}$ century, archaeologists often applied terms which signified reigning polities or perceived archaeological traces of such polities, even where these had no perceivable political impact (Akkermans & Schwartz 2003, p. 13). Additionally, defining the typical characteristics of cultural elements associated with a political unit has proved extremely difficult (Wossink 2009, p. 27). In Mesopotamia, research on the late 3$^{rd}$ millennium BCE can include periods like the Akkadian – from the so-called empire of the same name (cf. 3.3.2) – and Ur III (cf. 3.3.3), while early 2nd millennium BCE topics often apply terminology such as the Isin/Larsa and the Old Babylonian periods (cf. 3.4.1 and 3.4.2). Referring to such historical periods, Charpin has argued that these denominations are imprecise, since the Babylonian dynasty emerged in the beginning of the 19th century BCE, while the Isin/Larsa hegemony of southern Mesopotamia in fact ended in 1763 BCE. Instead he suggested the MBA as a whole should be called the Amorrite period, due to its integration of the important Amorrite element in the politics, culture, and society of the early 2nd millennium BCE Syria and Mesopotamia. In addition, this denomination was actually used by the ancients themselves when referring to this period. Incidentally, their version of what we call the Ur III period was "the period of Šulgi" (Charpin 2004, p. 48). Research into Syrian archaeological themes within the same temporal horizon operates variably with cultural horizons and associated chronological terms like Early Jezirah or Old Jezirah to the Old Assyrian period, as well as the use of Early and Old Syrian (cf. e.g. Akkermans & Schwartz 2003, pp. 236, fig. 8.2, 291-292, fig. 9.2; Pfälzner 2007, p. 37, fig. 10; Wossink 2009, p. 28, table 2.4).

While is necessary in certain contexts to assign names to cultural assemblages occurring on a regional scale, it seems to me to be rather confusing to apply this terminology in a purely temporal and diachronic perspective, as well as being less useful in the presentation of geopolitical developments following below (cf. 3.3 and 3.4). The need for synchronisation between these different regional sequences and the development of an integrated relative and absolute chronology in the Near East has prompted the establishment of the interdisciplinary and international ARCANE project, which specifically works toward this goal (http://www.arcane.uni-tuebingen.de/presentation.html). For this reason, and particularly for simplistic purposes, I will in this study consistently use the generic interregional terms Early Bronze Age (EBA) and Middle Bronze Age (MBA) as shown in e.g. Pfälzner (2007, p. 37, fig. 10), and apply this to discussions all concerning parts of the Near East. The often used term *the EBA-MBA transition* according to the MC is set at 2000 BCE, as in the framework of Akkermans & Schwartz (2003) and Matthiae (1980), while 2400 BCE marks the transition from EBA III to EBA IV. Internal divisions of the EBA into the subphases IVa (c. 2400-2300/2250 BCE) and IVb (c. 2300/2250-2000 BCE), as well as the MBA into I (c. 2000-1800 BCE) and II (c. 1800-1700/1650 BCE, but in fact here ending with the fall of Mari), as shown by Matthiae (1980, p. 52, fig. 9) are in this study primarily divisions of convenience and for use in the geopolitical narrative below, but also follow some general politico-historical breaks inferred from the textual material as well as the material culture (cf. Pfälzner 2007, p. 37, fig. 10; Akkermans & Schwartz 2003, pp. 243-244; 291). As the focus in this thesis is Syria, it also fit better with the overall context to apply these terms rather than the chronologies used with regard to Mesopotamia, due to their more direct association with Syrian archaeology (cf. Matthiae 1980, p. 53). However, before turning to the EBA-MBA historical events and developments in the Near East, I will consider certain aspects concerning languages, populations, and texts, due to the extensive integration of and dependence on precisely such sources in several parts of this synthesis – particularly with regard to the subchapters 3.3 and 3.4, as well as 5.2.1, 5.3, and 5.4.2.

## 3.2 Textual sources as a contextual resource

### 3.2.1 The use of Bronze Age cuneiform tablets

Few of the tablets from which the wealth of information on the Bronze Age has been extracted are in undamaged condition. Many are broken in half along the short axis, and due to the nature and syntax of Bronze Age letters, this either conceals the writer and recipient or the main content of the text (Heimpel 2003, p. 6). Other breaks present different problems. By far the majority of scholars focusing on Near Eastern Bronze Age themes and including textual material in their research rely on the painstaking process of reading, transliterating, and editing the content of these tablets, mostly carried out by Assyriologists and epigraphists. For archaeologists, such sources provide a privileged insight into an otherwise impossibly hidden world, and it would be imprudent to reject them as data, despite the problematic issue of not being able to independently confirm these translations. The degree to which documentary evidence is being integrated into archaeological research depends on the objectives and outlook of the individual scholar, but few would deny the usefulness or even necessity of a multidisciplinary combination of evidence at some level, and the fact that such an approach is the most promising for yielding results (Zimansky 2005, pp. 318-319; van de Mieroop 1999, p. 5). Using texts written in a language unknown to the archaeologist as a resource is merely one aspect where research has to rely on the work of other types of scholars. Climatology, radiometric dating, and other natural sciences also carry an inherent dependency on trusting the work carried out in other scientific disciplines, without much possibility for a scrutinised reexamination. Properly published papers in journals of high scientific standing should be the litmus test which tells us whether or not the result of a scientific work is methodologically applicable for further research. Competition within the scientific community should also ensure that the discussion of results would follow in the proper channels. This is my main argument for using research carried out by various scholars in a number of scientific disciplines, within which I would be a mere layman, to support the arguments in this primarily archaeological study.

Cuneiform tablets were formed by writing in moist clay and then dried and hardened in the sun. Although this method suggests that tablets had better chance for preservation than other textual materials, they were regularly recycled for writing by remoistening the clay, or could even be used as building material, as was the case in Mari, where archives from the time of Yahdun-Lim had been built into the walls of the palace (Charpin 2004, p. 52 – cf. 3.2.2). The history of the Bronze Age Near East comes from texts which can be divided into two groups (cf. Charpin 2004, pp. 55-62 – also cf. van de Mieroop 1999, pp. 13-34 for elaboration on the nature of such sources):

- royal inscriptions (royal lists, year-names, memorial inscriptions, and hymns)
- archival documents (legal texts, administrative documents, and letters)

The latter were written for bureaucratic use, and are of economic, administrative, or communicative nature – for instance contracts, inventories, and so forth. This has the advantage of them being rather descriptive of the contemporary situation, but can sometimes also hamper our understanding as much which at the time was common knowledge or taken for granted has been left out of these texts. Information was probably also often conveyed orally between the recipient and sender at the time of delivery by tablet carriers (Charpin 2004, p. 64).

Cuneiform tablets as archaeology also carry issues. Many have come to light via illicit excavations, which of course make their contextual association highly contentious. The information they convey can maybe shed light on the Bronze Age world, but legal and moral aspects as well as the contextual ones severely complicate the matter (Zimansky 2005, pp. 315-316). Another perspective which must be considered is the temporal one, with long stretches of time and large parts of the population not being associated with texts at all (Zimansky 2005, p. 311). During these so-called Dark Ages very little seems to have been written down on tablets, perhaps due to a reduction in the proportion of sedentary populations and consequently a bureaucratic need for written archives – i.e. organisational differences between the socially complex nature of urban structures versus the more face-to-face and personal character of societies organised in smaller tribal groups (Zimansky 2005, pp. 317-318 – cf. 5.2.1.3 for further discussion on this topic). However, there could also have been a political factor in play, e.g. with an increase in general regional unrest and mobility during such periods (cf. 3.4.1). A wealth of information has emerged from the large palace archives of the Near Eastern EBA and MBA (**Figure 3.2**), but many of these only span a few decades (Charpin 2004, p. 66). While this may imply that there is an inherent danger of projecting information which only relates to a limited spatiotemporal context onto large expanses of time or space, most of these small windows across the region seem to paint the same general demographic and economic picture (cf. Porter 2012, p. 30 – for further discussion cf. 5.2), and the Mari archives (cf. 3.2.2) do not necessarily represent a distinctively unique context. For instance, between the Ebla archives in the 24th century BCE and the Mari archives in the 19-18th century BCE, precious little information comes from Syria itself. Texts from Mesopotamia therefore become our only source for building a tentative political history of the western Near East, through implications, assumptions, and syntheses. Using a multi-faceted approach, it might be possible to construct a contextual picture for Syria and even the Palmyrene.

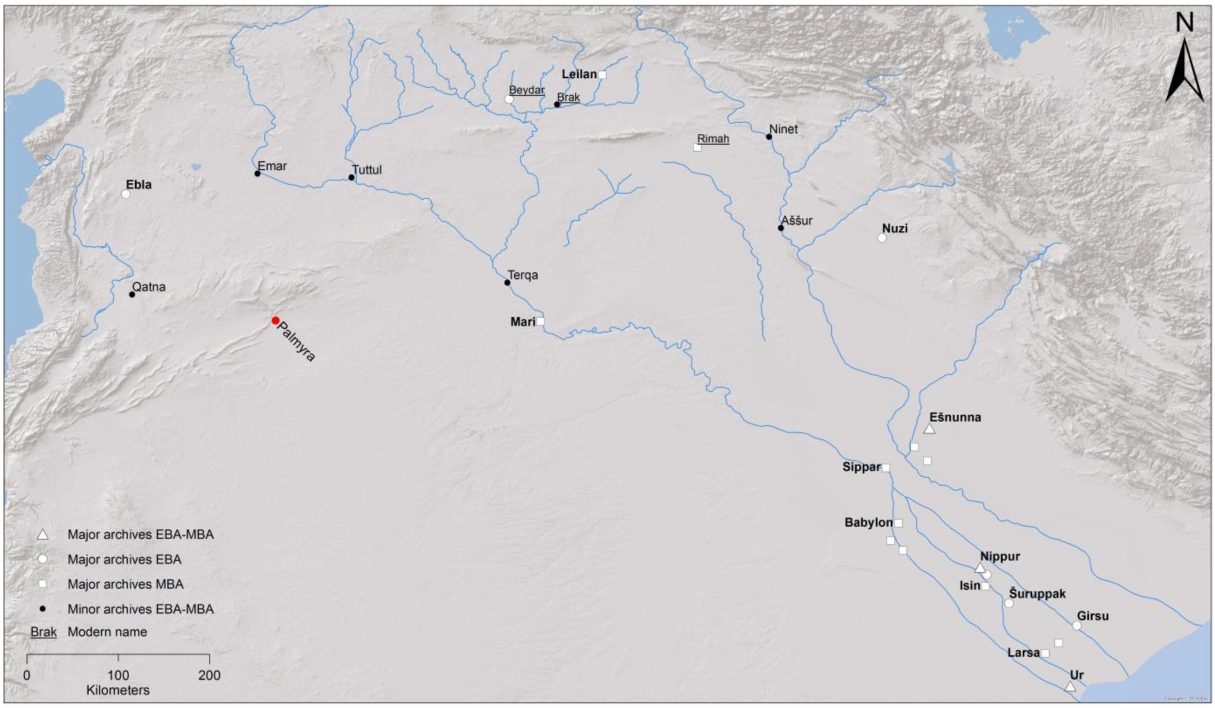



**Figure 3.2:** The locations of Near Eastern archives containing cuneiform tablets dating to the EBA and MBA, many of which are mentioned in the text. The central archives for this study is those found at Mari (cf. 3.2.2), although the Ebla archives (cf. 3.2.3) and the ones from Mesopotamia (cf. 3.2.4) are also important. Finally, there is one noteworthy mention located outside this map – the Kaneš archives from modern Kültepe – which is situated in Anatolia, north of the map line.

### 3.2.2 The Mari archives

For the purposes of this study, the central source of information on ancient Near Eastern practices are the archives discovered at Mari – and the value of these texts can in my view not be overstated. The excavations there started in 1933, led by André Parrot, and a large number of tablets were soon found in the palatial archives, and as Mari was destroyed by Babylon in 1760 BCE (cf. 3.4.2.3) and never rebuilt or reoccupied, almost all of these texts dated to the first half of the 18th century BCE (Fleming 2004, pp. 1-2). The archives consist of about 20000 texts from tablets and fragments roughly divided into two type-groups – administrative documents and letters. While texts of the first type are found in many archives dating to the EBA and MBA, the letters, numbering 3000-4000 examples, are unique. They were in fact organised into groups and tagged by Babylonian scribes following the fall of Mari at the hands of Hammurabi of Babylon, but only a select few actually removed from the palace and sent to Babylon, leaving a large number behind. These letters include correspondence between kings, client kings, governors, tribal leaders, palace officials, and numerous other actors found all over the Near East, and provide vast information on diverse aspects of ancient society, although most date to the rule of its last king, Zimri-Lim (Heimpel 2003, pp. 4-6; Fleming 2004, p. 2 – cf. 3.4.2.3). The translation and publication of the archives have been ongoing since their discovery by the French Mari School, from the initial work by Thureau-Dangin and subsequently decades of work under Dossin until the 1980s, when first Birot and then Durand and Charpin took over. The latter scholars have greatly increased the process of translation and publication, providing new perspectives and interpretations, some of which have completely altered our view of ancient Near Eastern society (cf. 5.2.1.1). Until recently, nearly all this research was published in French, mainly through the series *Archives Royales de Mari* (ARM) and *Florilegium Marianum* (FM), as well as in certain other works (cf. Fleming 2004, pp. 3-4), and syntheses and topics such as those covered by Charpin (2004) and Durand (2004) have proved particularly valuable for the present study. However, after 2000 an increasing number of translations and interpretations of the Mari texts in English have been made available, most importantly the research carried out by Heimpel (2003) and Fleming (2004), but also a number of other notable scholars, and many of the aspects to follow here (e.g. 5.2 and 5.3) depend heavily on these – as they themselves do on the Mari archives.

### 3.2.3 The Ebla archives

Due to the predefined temporal horizon here (cf. 1.2.1), the Ebla archives could be said to be situated on the chronological fringe of the scope of this study, but their historical significance for the perception of EBA Syria is highly valuable. About 17000 cuneiform tablets and fragments were found in various rooms of the excavated palace, providing both the first direct historical insight into early Syrian events, as well as evidence for a Semitic-speaking population in Syria prior to the emergence of Akkadian and Amorrite in the textual material (Matthiae 1980, p. 161; Akkermans & Schwartz 2003, pp. 235, 239). The documents were mainly administrative records, meant to serve a centralised state bureaucracy and show an economic foundation heavily built on sheep, wool, and textiles, but the archives also contained a few literary and lexical texts (Matthiae 1980, p. 155; Akkermans & Schwartz 2003, p. 239). The administrative and economic nature of the archives makes it possible to infer some of the political and economic hierarchies and developments of EBA Syria, as well as providing a corpus of regional toponyms from this period, which are believed to generally date to the 24$^{th}$ century BCE and span about three generations, or c. 40-50 years (Klengel

1992, p. 22; Akkermans & Schwartz 2003, pp. 243-244). While this source cannot be compared in importance to the Mari archives for the purposes of this study, a recent interpretation of their content by Porter (2012) has yielded intriguing results in terms of comparative analysis between the EBA and MBA Near Eastern society, which will be discussed later (cf. 5.2.1, 5.3.1, and 5.4.1). However, the value of the Ebla archives as a window for interpreting political and economic conditions in an otherwise historically murky Syria during the EBA IV is highly significant (cf. 3.3.1 and 5.2.2).

### 3.2.4 Other Near Eastern archives

Finally, I will briefly mention some of the other archives (cf. **Figure 3.2** for a wider view) which have brought to light aspects of the EBA and MBA Near East to be employed in this study. Apart from the Ebla archives, texts from the 3rd millennium BCE are known mainly from the southern Mesopotamian cities. While many of these – for instance the so-called Royal Correspondence of Ur (cf. 5.3.1.1 for further discussion) – are MBA copies of royal inscriptions, often from monuments in temples, and above all from Nippur, a large number of administrative and economic texts from Mesopotamian sites are also known, e.g. from Umma, Lagaš, and other cities on the Alluvium (Kuhrt 1995, p. 47). The Ur III period (cf. 3.3.3) is well-known for its massive corpus of administrative documents as well as a massive production of literary texts from scribal schools. The high degree of state control over production – and particularly the textile production (cf. 5.2.2.1) – and wide-ranging network of taxation required a vast bureaucracy. Unfortunately, many of the tablets from this period come from clandestine excavation and trade, meaning that the archives have not only been scattered far and wide, but as huge amounts of them were illicitly unearthed at places like Sippar and Drehem in the late 19th century CE, many are not associated with any accompanying contextual details (Postgate 1994, p. 59). The Drehem archives have proved to be an especially rich source for information on economic conditions and networks during the EBA. It has been identified as ancient Puzriš-Dagan near Nippur, which was a massive taxation and redistribution centre for the Ur III dynasty during the last century of the 3rd millennium BCE characterised by meticulous record-keeping of all in- and outgoings – more often than most of livestock (cf. Kuhrt 1995, pp. 59-61; also cf. Klengel 1992, p. 32). There are also a few Syrian examples of cuneiform archives from the EBA IV, most notably from Tell Beydar, ancient Nabada, where a corpus of 140 tablets contemporary with the Ebla archives provides the first written evidence from the Jezire. These are administrative texts referring to the pastoralist economy of the ancient town and are suggestive of a client relationship under Tell Brak, ancient Nagar, situated nearby (Akkermans & Schwartz 2003, p. 259 - cf. 3.3.1 and 3.3.2). Tell Brak itself has also yielded administrative records from EBA IV, and more specifically from its time under the later Akkadian rulers (cf. 3.3.2), which shed light on economic aspects of palace redistribution and other bureaucratic affairs (Akkermans & Schwartz 2003, p. 280).

Large parts of the Near East have little or no textual sources informing us on conditions during the first century of the 2nd millennium BCE, although there are some administrative documents from this period known from the Alluvium. One important source for the understanding of economy and society in northern Mesopotamia and Anatolia has been the Kaneš archives from modern Kültepe (cf. Larsen 1976, pp. 50-55). Initially known only from tablets illicitly unearthed by local inhabitants and sold, subsequent excavations by Czech, but mainly Turkish archaeologists discovered over thousands of tablets originating from private archives in the residential area of the ancient town belonging to Assyrian merchants. The main corpus consists of contracts, proceedings, and other legal texts, but a substantial amount are letters sent between these merchants and their families and business partners in Aššur, providing a different view to that of the many administrative documents. To date over 20000 texts have been found at Kültepe, and nearly all of them come from a layer which is dated to 1910-1830 BCE, thus providing a window of information into the period between the Ur III dynasty and the Mari archives. Following a hiatus a smaller collection has been found in a layer which spans the reign of Šamši-Addu over Aššur, dated to 1810-1740 BCE (van de Mieroop 2007, p. 95). Of course, the Mari archives is our main source of information from this period, but smaller archives from Tell Leilan, Chagar Bazar, and Tell Rimah can also be used to support the interpretation of MBA economy, geopolitics, and society inferred from the Mari texts (Kuhrt 1995, p. 74; Wossink 2009, p. 125). Tell Leilan was the capital of Šamši-Addu and has yielded a number of tablet containing letters and treaties from the later MBA (Akkermans & Schwartz 2003, p. 312).

This subchapter has of course only briefly touched upon the vast and confusingly complex corpus of textual sources from the late EBA and MBA Near East, as the topic is far too large for the scope of this study. I have merely mentioned some of the textual sources I will rely on in the geopolitical presentation below (cf. 3.3 and 3.4), as well as in my analysis of mobile pastoralism in ancient Near Eastern society and economy (cf. 5.2, 5.3, and 5.4), and most of this is viewed from the shoulders of the scholars who has read, translated, interpreted, and synthesised the texts from all these archives during the last century of archaeological and historical research. But before I turn to the historical summary for the period c. 2400-1700 BCE, I will in short focus on the very few attestations of the Palmyrene from these archives and then present some aspects on ancient Near Eastern languages and populations.

### 3.2.5 Textual attestations of the Palmyrene

The very few texts mentioning the Palmyrene directly can be summarised within the space of a paragraph. The Kaneš archives contain a reference to inhabitants of Tadmor, the Semitic denomination for Palmyra, called as witnesses:

**Text 3.1: (…) i**n front of Merali, in front of Puzur-Ištar, from Tadmor. (…) Seal of Merali, son of Aššur-Šallim, seal of Puzur-Ištar, from Tadmor (cf. Scharrer 2002, pp. 301-302 – my translation from German).

Whether this text implies that both Merali and Puzur-Ištar are from Tadmor, or only the latter is not clear, as the second sentence in fact identifies Merali by his patronymic. Since central Anatolia is relatively far from the Palmyrene, one might be cautious and consider the fact that the reference could deal with another, unknown place by the same name. However, we know from the Mari archives that Tadmor indeed was the name of a settlement situated in that central Syrian oasis during the MBA, as it is today. One other attestation of Palmyra is also known from Kaneš, but it is a mere entry in a list recording a small amount of silver supplied from Tadmor (cf. Scharrer 2002, p. 304). Famously, there is a text from the Mari archives which describes the settlement, together with Našala (modern Qaryatein), having been assaulted by a band of Suteans (Scharrer 2002, p. 307 – cf. text **5.12**), which is discussed further under 5.2.1.4 and 5.3.3. Finally, two texts mention the oasis or its inhabitants being associated with messenger deliveries and the communication route between Qatna and the Euphrates valley (Scharrer 2002, pp. 312-314):

**Text 3.2:** When they came on their trip on the eastern shore (of the Euphrates), the Babylonians camped by our ambassadors and the Qataneans [i.e. people from Qatna]. They did not (…). The Babylonians stayed for themselves with their sheep. In the night, Suteans attacked the Babylonians. They killed a high-ranking Babylonian (named) Lidnuša and injured another. With their noise leapt our men upon (…). They killed five enemies. Our ambassadors, the Qataneans, and the letters are unharmed. To Tadmor (accompanied) by an escort (…) (cf. Scharrer 2002, p. 312 – my translation from German and my clarifications in brackets – cf. 5.3.3).

**Text 3.3:** (…)(Two) Tadmoreans bring a letter from Išhi-Addu of Qatna to the king. Presently, I will send them to my Lord. My Lord must question them and then send them to the king (cf. Scharrer 2002, p. 314 – my translation from German).

These comprise the only direct mentions of Palmyra from the period in question, although there are a few references attested in LBA texts. The Palmyrene as a region can be said to be referred to indirectly on some occasions, of which the most famous are the instructions (text **3.4**) from Šamši-Addu to his son in Mari, Yasmah-Addu, with regard to marching an army of 20000 men to Qatna via one of the three routes from Mari. In addition, recently a draft reply (text **3.5**) from Yasmah-Addu was noted by Charpin (2010):

**Text 3.4:** [*Excerpted part*]. La'um and Mutu-Bisir are used to receive many letters, consult with them, and take your decisions depending on your discussions with them. Mutu-Bisir (besides) has much experience with these routes. Get yourself informed about these routes. Send several persons that they may enquire in your place about the water supply and decide depending on the detailed report they bring back (…).

[*Excerpted part*] Prior to departure, if you do not know where to rely on concerning the access to water on these routes, the decision (to leave) should not be taken. Given that there are Uprapeans [cf. 5.3.2.2 and 5.3.3] that have experience of these routes, send the people that have experience of these routes so that they know in your place where to rely on concerning the supply of water on these routes.

Send me a detailed report. Which is the right route for the march of the army? Is the upper route best? Is the middle route best? Is the lower route best? Is it best to go straight on from where you are? The army, will it depart from Abattum? Will it depart from Halabit? Or will it depart straight on from where you are? [*Excerpted part*]. (cf. Postgate 1994, p. 251; Charpin 2010, p. 240 – my clarifications in brackets and less relevant parts of the text excerpted here).

**Text 3.5:** Previously, my Lord wrote to me concerning the decision to be taken regarding the wells on the route to Qatna. I assembled (…) the men that are knowledgeable about the wells and I sent to my master the men knowledgeable about the wells, (i.e.) the Uprapeans [cf. 5.3.2.2 and 5.3.3]. But up to now my master has not sent me any confirmation. At present, I have asked Mut-Bisir about the route to Qatna He spoke thus: 'I (…) Neither the route that is in front of [i.e. going straight from] Mari, nor the route that is in front of Dur-Yasmah-Addu are convenient (…). The army may take the route of Abattum (…) (cf. Charpin 2010, p. 241 – my clarifications in brackets).

Both these texts are clearly referring to the Palmyrene dry steppe and seemingly taking place during a period of low water availability in this biome, although as such a large army undoubtedly would require exceptionally secure supply points, it is in fact possible that even the humid season was the seasonal context. In any case, certain implications inferred from them will be developed further under 5.3.2 and 5.3.3. If one includes Jebel Bishri as a part of the Palmyrene, meaning the dry steppe and highland between the Euphrates and the Orontes, a few more can probably be added (cf. Pappi 2006; Charpin 2010). Presumably, the closer spatial relation to the Euphrates valley and events unfolding there precluded that the Bishri region had a larger role in Mesopotamian developments and thus the documentary evidence, than the more isolated highlands north of Palmyra. Therefore it is possible, albeit speculation, that attestations of Jebel Bishri in Mesopotamian sources could in fact generally refer to the dry steppe region west and south of the Euphrates valley between Emar and Mari, but without further specification deemed necessary by the ancient scribes. It is indeed unfortunate that no cuneiform archives dating to the MBA have been discovered and published from the recent Syro-Italian excavations (also cf. 4.7.4) at Tell Mishrife (ancient Qatna), as both Palmyra and the Palmyrene are situated more proximate to this site than the case is for Mari, and the oasis has even been suggested as forming part of the Qatna kingdom (cf. Joannés 1997, pp. 411-412). Any information gleamed from such sources would surely have provided a substantial increase in our knowledge on this region in the late 3$^{rd}$ and early 2$^{nd}$ millennium BCE.

### 3.2.6 Languages and populations

Although nearly all our Near Eastern archival sources dating to the EBA IV and MBA – apart from the Neo-Sumerian Ur III texts (e.g. Kuhrt 1995, p. 59) – were written in the Akkadian language, the region harboured a number of populations which have been considered to represent different ethnicities with their own languages or dialects (cf. Heimpel 2003, pp. 13-28 – also cf. **Figure 3.3** and 5.3.1).  In addition, the physical distribution patterns of these Near Eastern populations and their cultural or linguistic influence on various societies and parts of the region clearly changed and developed through across these centuries. The Akkadian and Sumerian languages coexisted during the EBA, but use of Sumerian declined and ceased to be a living language after the Ur III administration, although it did survive for centuries in religious and scholarly texts. The Ebla archives also show that Eblaitic, which is the oldest known written Semitic language, was present in Syria in in the mid-late 3$^{rd}$ millennium BCE, and that it possibly constituted the main tongue of the Syrian plains region (Matthiae 1980, pp. 162-163; Akkermans & Schwartz 2003, p. 239). Hurrian (sometimes known as Subarean) is mostly known from names, but also from a few texts, and it was associated with people living along the northern rim of Mesopotamia (Charpin 2004, p. 52). Fleming (2004, p. 128) has argued that while there is some evidence for a Semitic-speaking Habur triangle in the mid-3$^{rd}$ millennium BCE, the same area was mainly Hurrian-speaking in early 2nd millennium, suggesting that this may have been a result of some demographic shift. However, it is also possible that a shift in cultural preferences favoured Hurrian so close to the Near Eastern rim. No Hurrian names are found in neither the Ebla nor Beydar texts, suggesting that the appearance of this language in Syria occurred later, and they first appear in documents from the early EBA IVb (Akkermans & Schwartz 2003, p. 285).

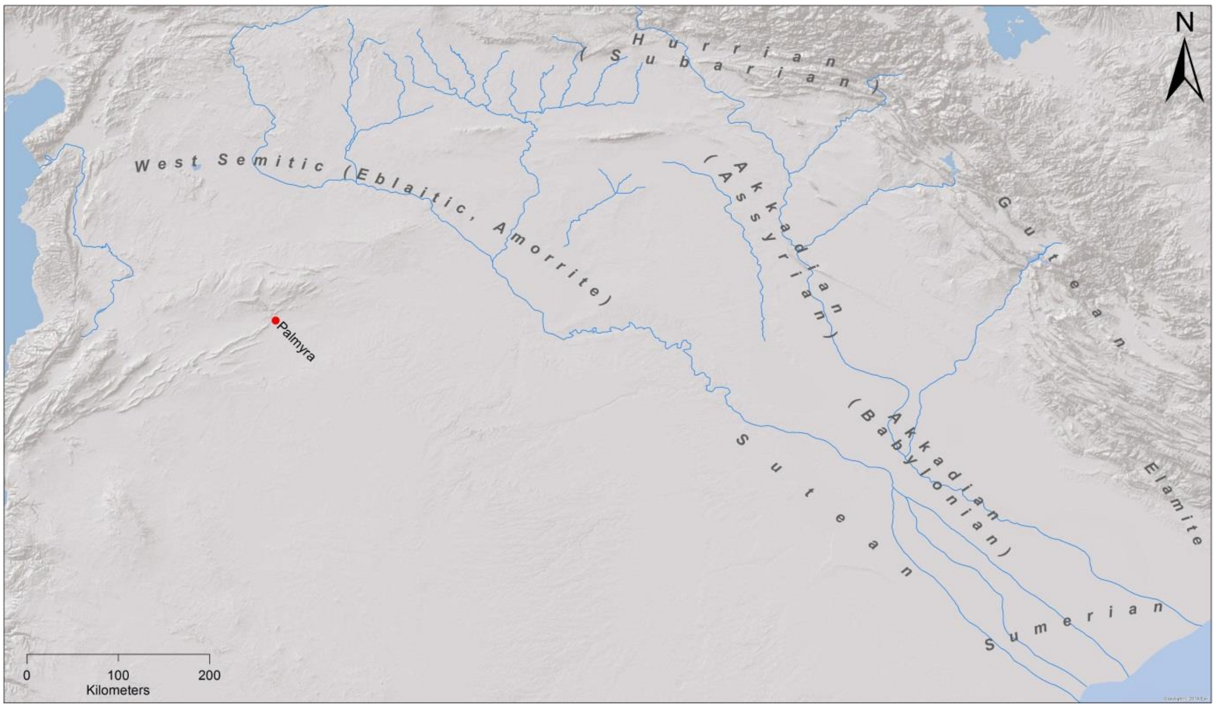



**Figure 3.3:** The main languages that is known to have been spoken in the Near East during the EBA IV and MBA, often also associated with respective population groups. Akkadian, the West Semitic languages, and Sutean were of Semitic origin, while certain others, like Sumerian and Hurrian, were in fact not related to any other languages known to us (cf. Postgate 1994, pp. 36-37, fig. 2:9).

Akkadian divided into two branches around 2000 BCE – Assyrian along the middle and upper Tigris and Babylonian closer to the alluvium (**Figure 3.3**). In Syria at this time, Semitic groups speaking the Amorrite language or dialect were found, although no texts written in Amorrite have so far been published (Heimpel 2003, p. 13). Most of our knowledge of it comes from Amorrite components in proper names, but these became common in many areas (cf. 5.3.1.3). However, both Whiting (1995, p. 1239) and Fleming (2004, pp. 310-313) proposed that many specifically Amorrite terms found their way into the Akkadian language, and were thus written in texts as part of the common vocabulary (cf. 5.2.1.2). In fact, Fleming (2004, p. 318) characterised Amorrite rather as a West Semitic dialect than as a distinct language, although it is clear that Mesopotamian interpreters existed who were proficient in

Amorrite, suggesting that it was either a separate spoken language or at least a West Semitic unintelligible dialect, as distinct from Akkadian as modern standard Arabic is from colloquial Arabic (cf. Heimpel 2003, pp. 13-14; Fleming 2004, pp. 40-41, 318; Porter 2012, p. 268). From the MBA period we know of other regional languages which can be discerned from texts and names. Elamite was the language of present lowland Iran, while Gutean was spoken by groups more or less inhabiting the mountains and foothills of Zagros and only known from a few names. Hurrian, Elamite and Gutean were like Sumerian seemingly not Semitic languages, nor related to each other. Finally, apart from peripheral fringe groups only mentioned in passing, like the Turukkeans and the Lullu far to the northeast of which we know very little (cf. Durand 2004, p. 133), the Near East harboured groups of a people which in the MBA texts are called Suteans. These were mainly found along the right bank of the Euphrates stretching from Jebel Bishri and southward to the delta, as well as sometimes being associated with the Palmyrene and the arid interior of this stretch (cf. 5.3.3 for an in-depth discussion on the Suteans). Sutean is linguistically intriguing in several ways. In a list of spoken languages from the LBA it can be found listed together with the ones mentioned above, thus suggesting it was distinct from Amorrite and Akkadian. Names of Suteans are known in many texts from Mari, and while they are mostly in Amorrite form, some appear to be Semitic, although neither Amorrite nor Akkadian (Heimpel 2003, p. 13). Heimpel (2003, pp. 26-28) suggested – mainly based on etymology, but also geography – that they in fact were early attestations of Aramaeans, which feature heavily in the Near East during the LBA and the Iron Age. His arguments are quite plausible, in that e.g. the clan Bar-Halanum has an immediate Aramaic meaning as “son of Halanum”, and that attestations of Aramaeans (Ahlamu) during LBA regularly refer to Suhum or the Palmyrene (cf. Heimpel 2003, pp. 27-28), which will be argued later (cf. 5.3.3) were two of the main parts of the Near East associated with this group during the MBA (cf. **Figure 3.1** and **Figure 3.3** – also cf. **Figure 5.12**). Suteans were probably not the only external Semitic tribal group, as others like the Yussan, Yapturum, and Ya’ilanum, seem to have had Semitic etymology (cf. Joannès 1996, p. 354; Fleming 2004, pp. 122-123; Charpin 2004, p. 167).  However, unlike some of the lesser known or peripheral groups, Akkadian, Amorrite, and Sutean were all associated with populations inhabiting Syro-Mesopotamia proper. Of course, many areas and cities also featured mixed populations (Heimpel 2003, pp. 13-14 – also cf. 5.3.1.3).

## 3.3 Geopolitical developments during the EBA IV

The remainder of this chapter will present aspects of the geopolitical context of the Near East and its development for the period c. 2400-1700 BCE, which comprises the periods EBA IV and MBA (cf. 3.1.2). While the geographical focus for this dissertation mainly is Syria, for several centuries across this temporal horizon the only available sources stem from Mesopotamia, and thus the perspective must necessarily shift to a view from the Alluvium. In fact, textual material from Syria dating to the interval c. 2300-1900 BCE is more or less absent. However, several studies (e.g. Sallaberger 2007) have attempted to use Mesopotamian archives to analyse contemporary conditions in Syria through implications – and in my view convincingly so. I will here base myself mostly on their research, as well as more generally accepted narratives for the Near East. For toponyms and geographical overview in this subchapter cf. **Figure 3.1** and **Figure 3.4**.

### 3.3.1 Early EBA IVa: Syria during the age of Ebla and Mari (c. 2400-2300 BCE)

The first glimpse of the geopolitical situation in Syria comes from the Ebla archives (cf. 3.2.3). Although the time-span of the archive is rather short, some information on the preceding period can also be discerned. The multitude of toponyms mentioned in the archive suggests that the Syrian plain was densely populated at the time. However, due to the very limited nature of the source material, basically consisting of the Ebla texts, the picture is rather fragmented. The two main political actors seem to have been Ebla itself and Mari, which both vied for influence over cities and settlements situated in the area between them along the Euphrates (Klengel 1992, pp. 27-29). Nagar (cf. **Figure 3.4** – also cf. 3.2.4) was seemingly of a similar size and enacted political influence in the Habur triangle, shown by its probable authority over Nabada and its alliance with Ebla against Mari (Sallaberger 2007, p. 422). This struggle for power fluctuated during the 25$^{th}$-24$^{th}$ century BCE, with Mari initially having to pay tribute to Ebla, and then *vice versa*. However, after a lengthy period of rivalry under guise of alliance, Mari was defeated – albeit not destroyed – near Terqa by Ebla aided in part by Nagar, which Mari had failed to conquer and still had to keep at bay (cf. Archi & Biga 2003, pp. 9-10, 13; Matthiae 1980, pp. 174-175; Akkermans & Schwartz 2003, p. 239). The extent of central power in this period is difficult to ascertain, but the frequent mention of various lords (known as *en*) governing settlements across the region with titles similar to the rulers of Ebla, for instance in Ugarit and Gubla, indicates that several political entities competed in Syria. Each seems to have included a network of political control or influence which comprised a number of settlements and towns of lesser political and economic importance, structured as a hierarchy with varying degrees of subordination and dependency (Klengel 1992, p. 28 – also cf. 5.2.1.3). The ruling elite was not necessarily traditional autocrats, and could have shared power and cooperated with e.g. councils of elders, i.e. acting more as heads of decision-making groups than as proper monarchs (Klengel 1992, pp. 27-28; Akkermans & Schwartz 2003, p. 239). Ebla, and presumably also other large Near Eastern polities, thrived on the production and trade of woolen commodities (cf. 5.2.2.1), as well as the potential for economic exploitation of geographical positions in an extensive trading network, such as between the Levant or Anatolia and Mesopotamia. The Ebla archives attest to an intense communication of merchants and messengers between settlements – to Emar, Abarsal, and even east to Aššur on the Tigris (cf. **Figure 3.4**). This eastward economic and presumably political orientation of Ebla could have provided the seed for its conflict with Mari (Klengel 1992, pp. 26-29). The archives come to an abrupt end in the late 24$^{th}$ century BCE (Akkermans & Schwartz 2003, p. 244 – although also cf. Mazzoni & Felli 2007, p. 206 for termination c. 2400 BCE), marking the end of EBA IVa in Syria (Matthiae 1980; Matthiae 2007, p. 5, note 1), and the city experienced violent destruction. The antagonist has not yet been definitely pinned down, but it seems to have been either the result of its conflict with Mari, which had not been destroyed when defeated (Archi & Biga 2003, pp. 34-35), or one of the Akkadian rulers (Akkermans & Schwartz 2003, p. 244 – cf. 3.3.2). Of the latter, both the dynastic founder, Šarrukin, and his grandson, Naram-Sin, boasted of having campaigned in Syria and in this context mentioned Ebla, although the latter claimed to have been the first to *subdue* Ebla (Klengel 1992, pp. 33-35). Archaeologically, Šarrukin could be the main candidate for the initial destruction layer, but the debate has not been conclusively settled. Sallaberger (2007, p. 422) supported the conclusions made by Archi & Biga (2003, pp. 34-35) in that in fact Mari destroyed Ebla three years after its defeat near Terqa, only to be destroyed utterly by Šarrukin soon after. He also suggested that a contemporary destruction layer at Nagar may be evidence of Mari campaigning in the Habur triangle just prior its fall (Sallaberger 2007, p. 422). However, it is clear is that both Ebla and Mari were later rebuilt and continued to function as important regional centres until the end of the 3$^{rd}$ millennium BCE (Akkermans & Schwartz 2003, p. 244; Matthiae 2007, p. 6). Unfortunately, the lack of textual sources from Syria itself clouds the political situation there with regard to EBA IVb.

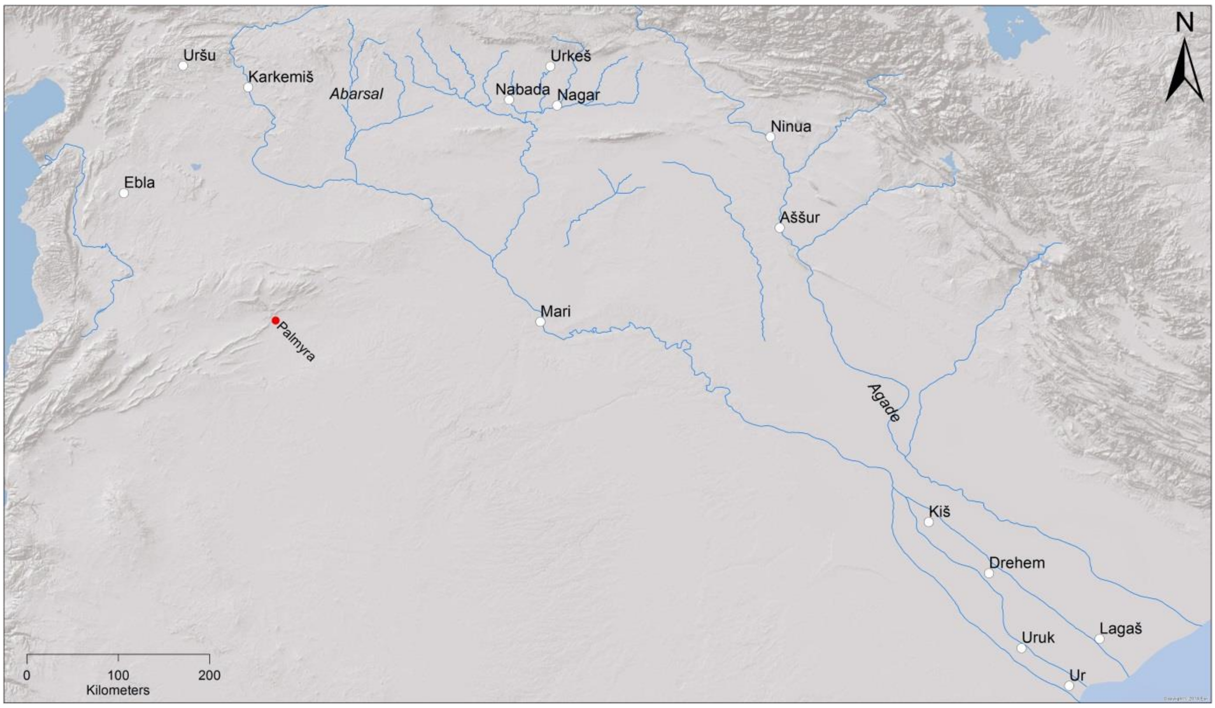



**Figure 3.4:** The main actors in the Near East during EBA IV and their geographical locations. Most of these feature in the geopolitical narrative of the late 3rd millennium BCE. Two of the toponyms in this map – Abarsal and Agade – have not yet been conclusively located and are therefore here approximately placed and italised.

### 3.3.2 Late EBA IVa and early EBA IVb: The Akkadian conquests and the Gutean interregnum (c. 2350-2100 BCE)

Because very few textual sources exist for Syria prior to the MBA apart from the Ebla archives, the main body of evidence used to construct a timeline of diachronic geopolitical developments originates outside the region, mainly southern Mesopotamia. The so-called Akkadian empire (also cf. 3.3.1) is usually said to have lasted from 2340 BCE to 2198 BCE, a horizon which includes its founder Šarrukin (2340-2284 BCE) and the last *de facto* ruler of any regional significance, Šar-kalli-šarri (2223-2198 BCE) (Kuhrt 1995, p. 44). Although the latter seemingly experienced border pressure from Gutean groups (cf. **Figure 3.3**) in the later years of his reign, he still held most of the realm together, but the two following and last Akkadian kings could only hold on to their capital city Agade and its surroundings (Kuhrt 1995, pp. 51-52). Agade itself has still not been identified among the tells of Iraq (Akkermans & Schwartz 2003, p. 278), but it seems to have been a new foundation by Šarrukin and not a previously important centre (Kuhrt 1995, p. 44). It was probably situated on the Tigris north of its confluence with Diyala, but south of Aššur (Westenholz 1999, pp. 31-33 – cf. **Figure 3.4**). Šarrukin and Naram-Sin (2259-2223 BCE) are well known to have claimed military conquests in Syria, while the two intermittent rulers, Rimuš and Maništušu, concentrated more on consolidating the exploits of their predecessor in northern Iraq and the eastern Habur triangle (Kuhrt 1995, p. 50; Akkermans & Schwartz 2003, p. 278). An Akkadian year formula including the *subjugation of Mari* and the likely presence of an Akkadian administration centre at Nagar (Akkermans & Schwartz 2003, pp. 278-79), do suggest that at least under Naram-Sin certain parts of Syria – at least the regions of Mari and Nagar, both of which probably controlled substantial regions (cf. 3.3.1) – were directly or indirectly under Akkadian control. However, in the case of Šarrukin, his military campaigns could have just as well been mere opportunistic raiding in lands weakened by conflict, like that between Mari and Ebla, and should probably rather be associated with obedience than defeat (Westenholz 1999, p. 38, note 113; Wossink 2009, p. 30). Naram-Sin installed various family members as governors in subjugated cities, and his daughter had an important cultic position at Mari (Kuhrt 1995, p. 50), but as Mari and other EBA cities in Syria are more or less absent in administrative texts from his reign, this region may have had a lesser or more passive role with regard to the Akkadian rulers than it did during the time of the Ur III state (cf. 3.3.3) (Sallaberger 2007, pp. 430-31). The subjugation of Mari happened possibly during the reign of Naram-Sin and was the seed for the so-called *shakkanaku* reign of the city, a title associated with governors instated by these conquerors (Akkermans & Schwartz 2003, p. 281; Archi & Biga 2003, pp. 29, 34). When Akkadian power contracted in the 22nd century BCE, Mari regained independence, but its rulers retained the original *shakkanaku* title for several centuries. Although the *shakkanaku* dynasty was previously believed to have ended in the late 20th century BCE followed by a substantial hiatus (cf. Durand 1985, pp. 169-171), a recent reassessment of the *shakkanaku* list suggests that it stretched on throughout the period from 2266 BCE until 1820 BCE, and ending as Yagîd-Lim or his son Yahdun-Lim took the throne of Mari (Otto 2007, pp. 421-422, fig. 12-13; also cf. Durand 2004, p. 153 – cf. 3.4.2.2).

Textual sources relating to Syrian affairs during the time of Akkadian rulers are very scarce, although Šar-kalli-šarri claimed to have fought against Amorrite enemies at Jebel Bishri (Sallaberger 2007, p. 431), and Naram-Sin also famously fought a decisive battle there against a coalition led by his rival Amar-Girid of Uruk, after which he noted the capture of several Amorrite chiefs (e.g. Wossink 2009, p. 121). The end of Šar-kalli-šarri's reign ensued the period called the *Gutean interregnum* (cf. 3.1.1), which in literary sources was characterised by "*invading barbarians from the eastern mountains*" (Kuhrt 1995, p. 56), i.e. from the

Zagros region. However, such rhetoric stands in sharp contrast to the fact that groups of Guteans, as well as those called Amorrites, served as contingents in Akkadian armies (Kuhrt 1995, p. 55), suggesting that the actual situation and many inter-group relationships were more complex than some of the ancient, more propagandised texts seem to imply (cf. 5.3.1 for further discussion on this topic), a pattern also repeated in later periods. As expected during such periods of turmoil and change, very few historical sources are known, and this is also the case for the Gutean interregnum. There seems to have been much competition between central actors in a politically fragmented Mesopotamia, with e.g. Gudea of Lagaš having brought in resources from far and wide for building projects (Sallaberger 2007, p. 431 – cf. 5.3.1.1 and text **5.17**), but the circumstances are mostly known from royal inscriptions. The veil lifts again in Mesopotamia with the emergence of the Ur III state at the end of the 22nd century BCE and its founder, Ur-Nammu (Kuhrt 1995, p. 58). However, the historical narrative of Syria and its geopolitical scene at this time must still be based on Mesopotamian sources.

### 3.3.3 Late EBA IVb: The Ur III state (c. 2100-2000 BCE)

Ur-Nammu’s rise to power is somewhat uncertain, but his reign is usually placed 2110-2093 BCE, during which most of the fragmented Alluvium was incorporated into one state (for regnal years cf. Sallaberger 2007, p. 420, table 1). The state was divided into provinces, with provincial centres and their governors. While local elites probably filled these offices, military commanders were in some cases recruited from fringe groups, like the Akkadian rulers had done. The Ur III state directed its military campaigns toward the southeast, east, and northeast, which led to the integration of e.g. Aššur and Elam (cf. **Figure 3.5**). The administration of the Ur III state was characterised by extreme centralisation and complex, all-encompassing bureaucracy (cf. 3.2.4). The documents attest to an extensive agricultural system, large production centres for wool and linen, and diplomatic relations with political actors of significance in Syria and the Habur triangle (Kuhrt 1995, pp. 60-61; Sallaberger 2007, pp. 433-434). Some of these controlled substantial areas, and e.g. the power of Mari at this time probably stretched up toward a seemingly independent Tuttul on the Euphrates-Balih confluence, as well as up to and including middle Habur – i.e. the same area as that under its direct rule during the Mari archives (cf. 3.4.2.2 and **Figure 3.7**). Both Mari and Ninua (later Niniveh) frequently communicated with the Ur III state, an expected state of affairs due to their proximity (Sallaberger 2007, pp. 438-39). Relations were friendly, with both a princess of Mari being married to Šulgi, the successor of Ur-Namma, and a princess of Ninua being married to the later king Šu-Sin (Kuhrt 1995, p. 63; Sallaberger 2007, p. 433).

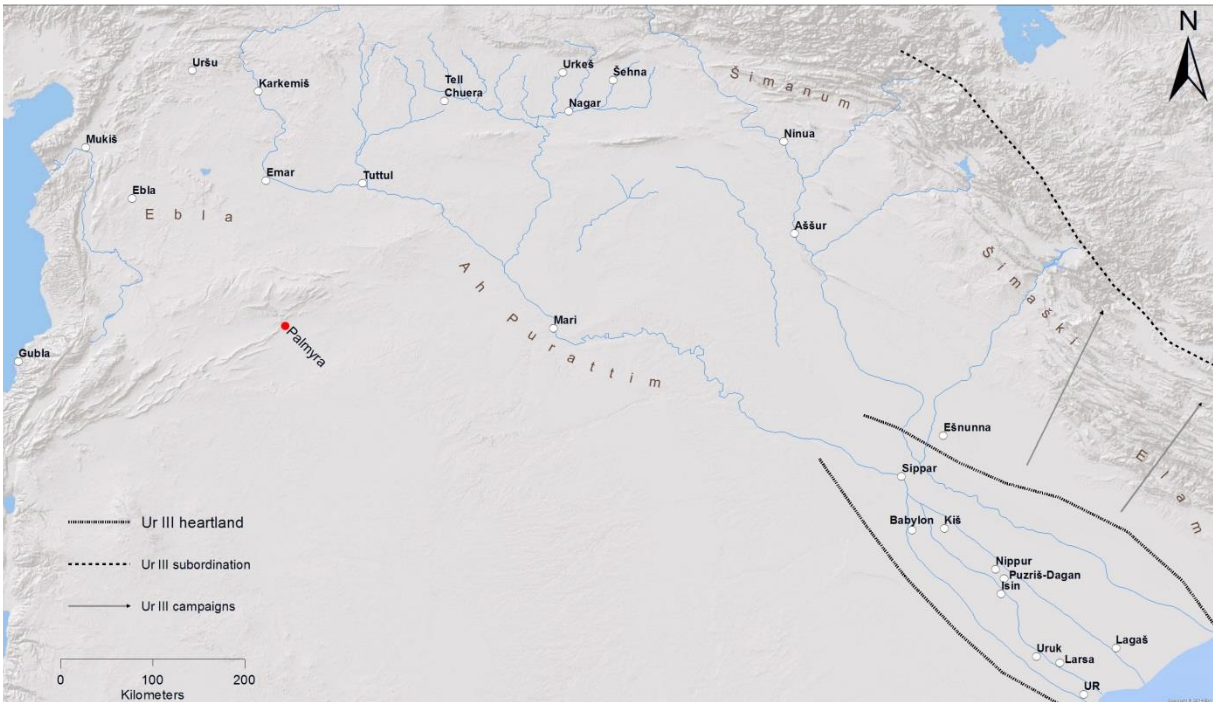



**Figure 3.5:** The heartland of the Ur III state on the Alluvium and the encompassing region, including several cities and polities discussed in 3.3.3. Some of these – like Šimanum – are approximately placed. Map reproduced after Kuhrt (1995, p. 57, map 3) and Porter (2012, p. 297, fig. 32).

Sallaberger (2007) attempted to get a glimpse of the geopolitical situation in Syria during this period by carrying out a study of the Ur III texts, focusing on the animals belonging to the king being distributed as royal gifts. He considered the available documentation as

*"(...) a rough, but fair representation of the actual diplomatic relations"* (Sallaberger 2007, p. 434).

Since temporal data can be obtained regarding these texts, they can in fact show whether communication was frequent or related to single visits, as e.g. in the case was for Gubla (Sallaberger 2007, p. 434). His collected data lists the date ranges for all texts and the number of attested gifts sent to individuals and places (cf. Sallaberger 2007, p. 435, table 5, and listing pp. 435-38). Most locations occur less than ten times in the corpus, and several of them can only be approximately placed in the Near East as a whole, but four places stand out – Mari, Ebla, Šimanum, and Uršu (cf. **Figure 3.4**). While the large number of Mari attestations can be both attributed to proximity and marital connections (Kuhrt 1995, p. 63; Sallaberger 2007, p.

438), both Uršu and Ebla could potentially be associated with political and/or economic importance. Šimanum, situated somewhere on the Upper Tigris (cf. Sallaberger 2007, p. 430, fig. 2 and Kuhrt 1995, p. 57, map 3), was linked to Ur by royal marriage, but so was Ninua, even though the latter only appears a few times in the list. Thus, it could seem that economic and/or political importance was a likely attribute for many attestations of a site in this particular study. He also divided places of fewer attestations into two groups – cities of second-rank importance, such as Ninua and Tuttul, and those situated particularly far from the Ur core area in geographical terms, such as Gubla and Mukiš (Sallaberger 2007, p. 439). The low number of sites from the Habur triangle he argued indicated a shift in centre of power from this region to the foothills of Tur Abdin through EBA IVb. Another point he made was that the Jezire and western Habur triangle – which included many towns in the early part of this period – seem toward the end of the 3rd millennium BCE practically devoid of settled societies, a picture also emerging in the archaeological material from e.g. Tell Chuera, Tell Beydar, and Tell Leilan (Sallaberger 2007, pp. 440-441 – cf. 5.2.2). In other words, during the late EBA IVb the Syrian situation seems to one of political fragmentation, although it is quite possible that most of the main actors had retained relative autonomy with regard to Mesopotamia powers throughout the EBA. For instance, Ebla continued to serve as an economic centre and was rebuilt soon after its initial destruction (Akkermans & Schwartz 2003, p. 244). Mari was probably also a fairly large regional power on the middle Euphrates with influence up the Habur, while cities like Karkemiš and Emar do not show up at all in the textual sources from the Ur III archives (Sallaberger 2007, p. 439). It is possible that these lay within the political orbit of influence of either Ebla or Uršu, although this is speculation. However, there seems to have been a lower degree of urbanism outside the main river valleys and in the lower Habur triangle, possibly indicating a shift to a mobile lifestyle among many previously settled populations (cf. 5.2.2.2).

The final rulers of the Ur III state, Šu-Sin (c. 2035-2027 BCE) and Ibbi-Sin (c. 2027-2003 BCE), experienced pressures from both internal and external groups. Although military action was mostly directed eastward, Šu-Sin also campaigned northward against the inhabitants of Šimanum, resulting in control over a vassal state in this area (Sallaberger 2007, p. 442). In relation to this conflict, a text mentions Amorrite groups called Tidnum and Yamadium fighting on the side of Šimanum (Sallaberger 2007, p. 442 – cf. 5.3.1.1 and text **5.16**). During the final years of the Ur III state the administration only seems to have upheld communications with Mari, Ebla, Šimanum, and the Yamadium. The latter of these may have referred to a tribe, with four attestations of an *Amorrite of Yamadium*, and they are always appearing with messengers from Ebla or Mari (Sallaberger 2007, pp. 437-438, 444). Amorrites, while clearly integrated into the Ur III state, became the classic external enemy in its literary sources. However, there are several problems associated with a simplistic interpretation of such perceptions as well as with the obviously complex realities of ancient Mesopotamian society (cf. Sallaberger 2007, pp. 444-445). In fact, it is possible that in the late EBA IVb the term "Amorrite" actually referred to someone of current or recent mobile past or lineage, a natural way of defining a person which was not to be associated with a city or town (Sallaberger 2007, p. 445 – for an in-depth discussion on this topic, cf. 5.2.1.1 and 5.3.1), similar to the MBA term *hana,* which depending on the situation could signify "our mobile pastoralists" (cf. 5.2.1.1). During the reign of Ibbi-Sin, problems could have turned to crisis as the Royal Correspondence of Ur describes how certain Amorrite groups penetrated the state itself, seemingly disrupting communication and captures fortresses in southern Mesopotamia. However, the historical accuracy of this source has been questioned (cf. 5.3.1.1) and the agency of these groups in the fall of the Ur III state seems exaggerated. More likely is a scenario where the lumbering bureaucracy and imperial structure started crumbling in the final decades of the 3rd millennium BCE and certain proximate groups both within and outside its borders took advantage of and exacerbated a critical situation. In any case, the final blow to the Ur III state came from its former subject states in the east, Elam and Šimaški (Kuhrt 1995, pp. 70-71).

## 3.4 Geopolitical developments during the MBA

### 3.4.1 MBA I: Mesopotamian developments and Syrian implications (c. 2000-1800 BCE)

The 2nd millennium BCE starts with Syrian affairs continuing to be shrouded in textual darkness, but in southern Mesopotamia the dismantling of the Ur III state created once more a rather fragmented geopolitical situation with new opportunities for ambitious and powerful actors. Initially, a former Ur III general, Išbi-Erra, established a dynasty centered at the city of Isin, and had by c. 1950 BCE gained control over several cities on the Alluvium, with the subsequent king, Išme-Dagan (1955-1937 BCE), calling himself *king of Sumer and Akkad*

(Charpin 2004, pp. 72-73). At the same time, an Amorrite dynasty probably associated with the Yamutbal tribe (cf. 5.3.2.3) emerged in Larsa, which during the reign of Gungunum (1932-1906 BCE) clashed with Isin, resulting in fluctuating spheres of influence between these two states (Charpin 2004, p. 80). The Isin-Larsa enmity soon led to a break-up of Isin political influence and decentralisation through the rise of numerous other local dynasties. Some of these, like Kisurra (modern Abu Hatab), had kings which included Amorrite affiliations in their titles, such as *head of the Rabbum* (Charpin 2004, p. 84 – cf. 5.3.2.2). By the early 19th century BCE southern Mesopotamia had fragmented yet further and consisted of numerous small states centered on a city, e.g. Babylon, Isin, Uruk, and Kiš, while the Larsa state was slightly more extensive in size and political influence (van de Mieroop 2007, pp. 90-92, and map 5.1; Charpin 2004, p. 86 – cf. **Figure 3.6**). Although it seems that every city of some importance in the region of Akkad (cf. **Figure 3.1**) had established an independent dynasty during the first half of the 19th century BCE (Charpin 2004, p. 88), most did only last a few decades, and all was eventually conquered by the emerging dynasty of Babylon established by Sumu-Abum in 1894 BCE, which conveniently also was the same year as the enthronement of Sumu-El of Larsa (cf. Charpin 2004, pp. 86-90). Such a pattern of fragmentation and subsequent consolidation seems to have prevailed also further north at Aššur and Ešnunna (van de Mieroop 2007, pp. 90-92, and map 5.1; Charpin 2004, pp. 106-107). Charpin considered the new dynasty of Babylon as being a result of a merger between two Amorrite tribes of the Yamina confederation, the Amnanum and the Yahrurum (cf. 5.3.2.2), with the first two kings belonging to either of these groups (Charpin 2004, p. 94). Likewise, the city of Kazallu constituted the main centre of the Amorrite Mutiabal clan (Charpin 2004, p. 97; also cf. Heimpel 2003, p. 17 – cf. 5.3.2.2 for their tribal affiliation and **Figure 5.12**).

As the 19th century BCE unfolded, the Larsa state continued to grow in size and importance based on a new dynasty, with its kings Warad-Sin and the famous Rim-Sin (1822-1763 BCE), who ruled nearly 60 years, including the time of the Mari archives. Initially, the state bordered onto Babylon, Uruk, and Isin, but after destroying Uruk 1800 BCE and capturing Isin in 1793 BCE, the only remaining rival was Babylon to the north (van de Mieroop 2007, p. 92). Babylon itself also gradually expanded during the reign of Sumu-La-El (1880-1845 BCE), integrating the formerly independent cities of Kazallu, Damrum, Kish, Sippar, and several others, and eventually incorporated Akkad from Sippar to Marad. This resulted in overlapping spheres of influence with Larsa and thus confrontations (Charpin 2004, p. 95). Similarly, in the Diyala valley, political fragmentation during the first half of the 19$^{th}$ century BCE led to the emergence of numerous small kingdoms, each with a capital and a population of both sedentary and mobile components. An inscription from Tell Haddad (ancient Mê-Turan) on the middle Diyala mentioning a Yarim-Lim titulated *chief of Amorrites*, and likewise the same title on the seal of a certain Itûr-Šarrum of Diniktum, imply also here the existence of dynasties for whom an association with Amorrite groups was very important (Charpin 2004, pp. 96-97). However, in time all these principalities were absorbed by the expanding state of Ešnunna (modern Tell Asmar) in the same region during the long reign of Ipiq-Adad II (1862-1818 BCE) (Charpin 2004, p. 100), who carried on after the unification of lower Diyala to expand northward on the Tigris and westward to Rapiqum on the Euphrates (Charpin 2004, pp. 139-140). Babylon expanded further during the reigns of Apil-Sin (1830-1813 BCE) and to a lesser degree southward under Sin-Muballit (1812-1793 BCE), father of one of the most famous figures of the Bronze Age – Hammurabi (1792-1750 BCE) (Charpin 2004, pp. 123, 131). Thus, the politically highly fragmented southern Mesopotamia of the early 19$^{th}$ century BCE was by the end of the century appropriated and consolidated into three major powers – Ešnunna, Babylon, and Larsa – without room for further expansion after the conquest of Isin in 1793 BCE (cf. **Figure 3.7**).

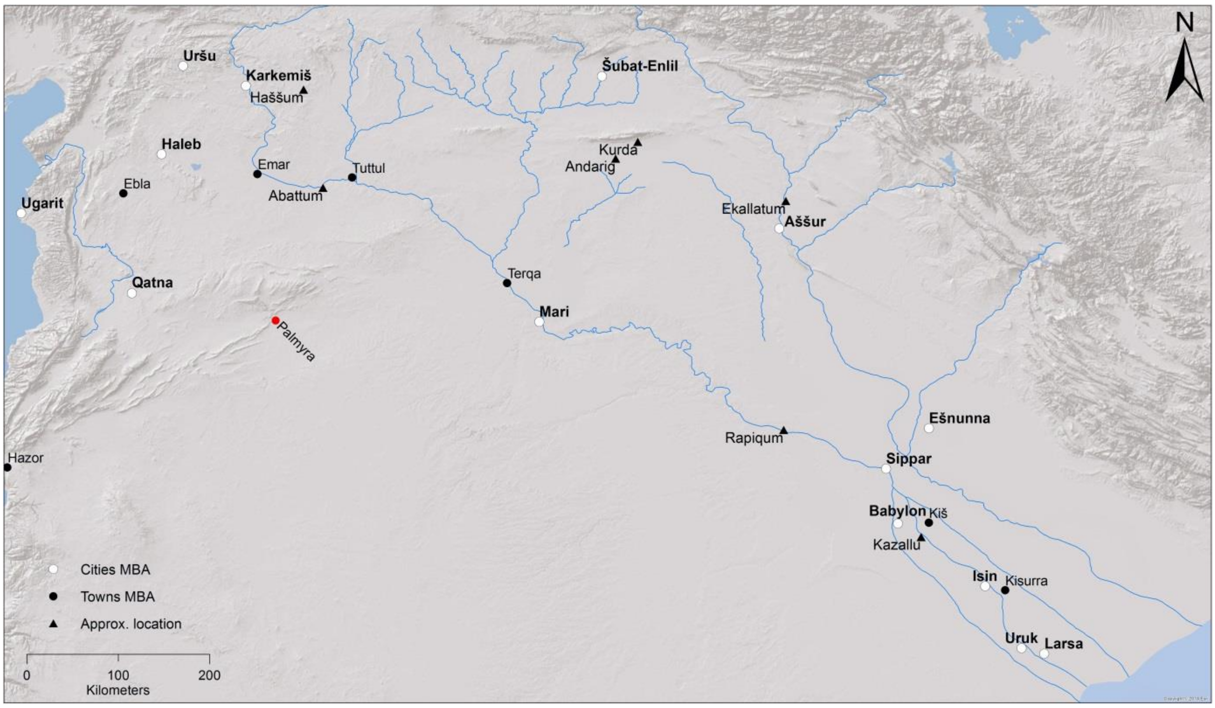



**Figure 3.6:** Near Eastern towns and cities figuring in the geopolitical narrative of the MBA. Apart from the main centres shown in **Figure 3.7**, most of the cities and towns marked here went from being relatively autonomous dynasties during the early MBA (cf. 3.4.1) to be subdued and incorporated into larger polities during the MBA II (cf. 3.4.2.3). Settlements of uncertain locations are placed approximatedly and marked with a triangle.

### 3.4.2 Late MBA I and early MBA II: The Amorrite dynasties and Syrian MBA developments until the end of Mari (c. 1850-1760 BCE)

#### *3.4.2.1 Syria during the early 19th century BCE*

Our evidence concerning Syrian affairs in the early parts of this period comes mainly from the Kaneš archives (cf. 3.2.4), and their implications for the geopolitical situation in Syria. On the other hand, the Mari archives (cf. 3.2.2) provide an enormous amount of information on the latter parts, meaning that the developments during MBA II can be presented much clearer. In addition, as much of the later discussion will be based on the Mari texts, it seems prudent for contextual purposes to go somewhat more in detail in this respect.

During the two first centuries of the 2nd millennium BCE, Mari was an actor of some size on the middle Euphrates, ruled by the *shakkanaku* dynasty (cf. 3.3.2), while the well-known MBA II powers of Qatna (modern Tell Mishrife) and Yamhad (modern Haleb/Aleppo) probably also expanded their political and economic influence to surpass Ebla in this period (cf. **Figure 3.6**). Ebla could still be considered fairly large town during the MBA, but its importance had diminished greatly compared to its position in the Near East during the EBA IV, probably due to the emergence of these other two major geopolitical actors (Matthiae 2007, pp. 3-4). Because Ebla lay between them, its economic importance was presumably eclipsed by their expansion, although most of the details surrounding these developments are uncertain (Matthiae 2007, p. 7). The politically fragmented situation in Mesopotamia seems also to be reflected in Syria during the MBA I, with small to medium-sized states, local dynasties, and competition for power and influence (van de Mieroop 2007, p. 94). The Kaneš texts, although mostly economic in nature, indicate that the caravans of tin and textiles from Aššur had to pass through territories belonging to independent rulers across the Habur triangle and the Jezire before arriving in Anatolia, with which individual trade agreements had to be reached for a safe thoroughfare and access to local merchant districts (van de Mieroop 2007, p. 98). Conflict between these petty states seems to have been frequent, while commercial interests and taxing opportunities usually meant that merchants were left in peace (van de Mieroop 2007, p. 99 – also cf. text **5.8**). Charpin argued that the Euphrates valley was certainly characterised by political fragmentation 20th to early 19th century BCE, with independent dynasties in towns like Suprum and Puzurran, and a town like Mišlan (cf. **Figure 5.12**, no. 8) – later a mere district of Mari – viewed at the time *as* important economically as its overlord a century later (Charpin 2004, p. 143).

#### *3.4.2.2 The competing reigns of Šamši-Addu and Yahdun-Lim*

The MBA I-II transition in Syria is dominated by its two powerful actors in the eastern part of the region – Šamši-Addu and his so-called kingdom of Upper Mesopotamia and Yahdun-Lim of Mari. Prior to their emergence, the MBA political narrative of the region is virtually unknown (Charpin 2004, pp. 142-143). Šamši-Addu began his rule around 1833 BCE, although the whereabouts of his original dynastic base is uncertain. While several centres have been suggested, e.g. Terqa and his later capital Šubat-Enlil/Šekhna, most are now more or less rejected in this respect. Ekallatum has a more relevant claim, but the AKL (cf. 3.1.1) indicates that the city in fact was conquered by him. However, Agade (cf. **Figure 3.4**) has been proposed as a good alternative, supported by several aspects linked to his reign. He called himself *king of Agade,* he undertook a pilgrimage there in his old age, his father Ila-Kabkabu and brother Aminum were both active in the Diyala region, and finally there was a Belet-Agade cult at Mari introduced when his son Yasmah-Addu took the throne, which disappeared again during the reign of Zimri-Lim. All of this could indicate that Šamši-Addu had a special affiliation with Agade (Charpin 2004, pp. 157-160). The Diyala valley was controlled by Ešnunna at this time, so Šamši-Addu campaigned northward on the Tigris, taking Ekallatum and Aššur in the last decade of the 19th century BCE. After this, his forces crossed Saggar and subdued cities in the eastern Habur triangle, where he chose Šehna as his capital, renaming it Šubat-Enlil (cf. **Figure 3.6**). At this point in both time and space his ventures clashed with those of Yahdun-Lim, the new king of Mari (Charpin 2004, pp. 161-162).

Yahdun-Lim took the throne of Mari c. 1810 BCE, possibly succeeding his father, Yagîd-Lim, who was active along the middle Euphrates in the latter half of the 19th century BCE – although not necessarily as king of Mari. His seat of power was probably Suprum (modern Tell Abu Hasssan) just south of Mari, and there seems to have been some conflict between him on the Euphrates and Ila-Kabkabu, the father of Šamši-Addu, on the Tigris (Charpin 2004, pp. 143-145). When Yahdun-Lim took power he assumed the title *"king of Mari and the Sim'alites"*, i.e. evidence for his dynastic affiliations with the Amorrite Sim'al tribal group (cf. 5.3.2.1). During his reign he expanded north along the banks of the Euphrates via Terqa up to Tuttul and likewise south to the district town of Suprum, unifying the area known as Ah Purattim (Fleming 2004, pp. 161-162; Porter 2012, p. 34 – cf. **Figure 3.1**), under one ruler, as well as northward along the Habur valley to Ida-Maraš in the Habur triangle, where many local principalities accepted his overlordship. As mentioned, his expansions there met with that of Šamši-Addu, and after clashing at Nagar, Yahdun-Lim prevailed and effectively extended his influence to the Balih valley (Charpin 2004, pp. 146-149). Yamhad was the dominating actor on the Syrian plains at this time, and contemporary with Sumu-Epuh was also the first known ruler of Qatna, Išši-Adad, although he was not the first of his dynasty there (Klengel 1992, p. 65). Thus, in the early 18th century BCE, Syrian affairs are finally back on the Near Eastern political scene, revealing a region dominated by three large entities – Qatna in the west, Yamhad in the north, and Mari in the east – powers that presumably had eclipsed any lesser principalities existing a century earlier and reduced them to vassals or put them under direct administration. However, some exceptions on their northern fringes, most notably Uršu, Haššum, and Karkemiš, seem to have been able to retain their autonomy. This political constellation opened up a new potential for power politics, evident from the Mari archives (Charpin 2004, p. 166).

Yahdun-Lim was assassinated and Mari vanquished by Šamši-Addu c. 1794 BCE, where after some years of neglect, he installed his son, Yasmah-Addu, on the throne c. 1785 BCE. At the same time also established his elder son, Išme-Dagan, in Ekallatum, thus more or less effectively expanded direct control over a large triangular area encompassing the Habur triangle, much of the Jezire, the Euphrates from Tuttul to Mari, and the Tigris down to the border of Ešnunna (Charpin 2004, pp. 167-171). Šamši-Addu could then rightly titulate himself as *"the one who unites the country between the Tigris and the Euphrates"* (Charpin 2004, p. 163). This is the area often called the kingdom of Upper Mesopotamia. Yamhad, who was looking to expand eastward across the Euphrates became his next main competitor in the region, and as the shrewd politician he was, he allied with its southern foe, Qatna, sealing the arrangement with a royal marriage (Klengel 1992, p. 65; Charpin 2004, pp. 173-175). There are certain indications that Hammurabi of Babylon actually was inferior to Šamši-Addu at this time (Charpin 2004, p. 165), presumably also a move in the spirit of *realpolitik*, with another substantial actor, Ešnunna, being situated between them (cf. **Figure 3.6** and **Figure 3.7**). Because of this alliance system and the geographical positions of its participants we can get some glimpses of activities and practices in the Palmyrene (cf. Klengel 1992, pp. 66-67). The border between Qatna and Yamhad was located just north of modern Hama and probably also stretched some distance eastward into the steppe, where razzias against the villages and pastures of each other seem to have been carried out frequently (Klengel 1992, p. 66; Charpin 2004, p. 166 – cf. **Figure 3.7**). Šamši-Addu sent reinforcements to Qatna via one of the Palmyrene routes on several occasions to curb razzias carried out by mobile pastoralist groups affiliated with Yamhad or due to internal upheavals (Charpin 2004, pp. 179-182; Klengel 1992, pp. 66-67 – cf. 3.2.5, text **3.4** and text **3.5**, as well as **Figure 5.14**). The enmity between Qatna and Yamhad during MBA II has in fact been suggested to have been rooted in specific tribal affiliations and the perpetual conflict between the Sim'al and Yamina tribal confederacies (Klengel 1992, p. 66 – cf. 5.3.2 and **Figure 5.13**).

#### *3.4.2.3 The Syrian geopolitical scene until the fall of Mari*

Šamši-Addu died in the first half of the 1770s BCE, although the exact date is unknown (Charpin 2004, p. 198). How integral he had been to the vitality and power of the kingdom of Upper Mesopotamia becomes clear when one take into account the development following his death. Išme-Dagan had to rely on promises and bribes to uphold his alliances, while previously the mere authority of Šamši-Addu had been enough (Charpin 2004, p. 197). But although Išme-Dagan retained his power in Ekallatum, the death of their father ended the reign of his younger son, Yasmah-Addu, in Mari about 1776 BCE. At that time, the well-known Zimri-Lim, who may or may not have been directly linked with the dynasty of Yahdun-Lim, ousted him from power with the help of Yamhad and probably Sim'alite tribal groups (Charpin 2004, pp. 199-200; Heimpel 2003, pp. 38-39, 42). However, Heimpel argued that if he actually *had* ousted the former king by force, he would have boasted about it afterward, and that in fact it was Ešnunna who forced out Yasmah-Addu, with Zimri-Lim subsequently entering Mari and claiming the throne (Heimpel 2003, pp. 40, 42). Zimri-Lim had lived in exile in Yamhad and was married into its dynasty (cf. text **5.6**). Undoubtedly, the break-up of the kingdom of Upper Mesopotamia led to geopolitical fragmentation, most notably in the regions of Ida-Maraš and Saggar (cf. **Figure 3.1**). The Mari heartland of Ah Purattim extended from Tuttul down to the region between Mari, Ešnunna, and Babylon, where the border between these states was located, although sometimes contested (cf. **Figure 3.7**). Zimri-Lim soon started campaigning both militarily and politically and managed to subdue most of Ida-Maraš, where the petty kings recognised him as overlord (cf. Heimpel 2003, p. 502, text **28 81**). The Saggar region, which included the cities of Karana, Kurda, Andarig, and Razama, stayed mostly autonomous and formed a buffer zone between Mari and Ešnunna, although they ceaselessly had to maneuver politically to retain their independent position (e.g. cf. Heimpel 2003, p. 530). However, there seems to have been a fine line between alliances and patron-client relationships in this respect. The geopolitical structure of power in the Near East during the MBA is clearly revealed in a famous letter to Zimri-Lim, where an official noted:

**Text 3.6:** There is no king who is strong by himself! 10 or 15 kings follow Hammurabi of Babylon, as many follow Rim-Sin of Larsa, Ibal-Pi-El of Ešnunna, and Amut-Pi-El of Qatna, while 20 kings follow Yarim-Lim of Yamhad (cf. Kuhrt 1995, p. 99).

Most of the region was evidently divided in terms of political control or influence between a few large polities (**Figure 3.7**), which acted as overlords over several smaller states, cities, or even tribal leaders. Of these six, Yamhad in northern Syria may have had the most extensive network of power, something which is corroborated by the fact that it was the main enemy of Šamši-Addu, as well as retaining its position also *after* the fall of Mari, Ešnunna, and Larsa to Babylon during the years 1763-1760 BCE (cf. Kuhrt 1995, p. 109). Even a state like Karkemiš, until then independent (see above), became a client kingdom under Yamhad during the 1760s (Klengel 1992, p. 59). Such a geopolitical structure is also discerned in another letter to Zimri-Lim, where the *"four mighty kings"* following the death of Šamši-Addu were listed to be Hammurabi of Babylon, Rim-Sin of Larsa, Amut-Pi-El of Qatna, and Yarim-Lim of Yamhad (Klengel 1992, p. 57). It was not until the Hittite invasions in the MBA-LBA transitional period that both Yamhad and Babylon fell. The network of patron-client relationships between major actors and petty rulers was indeed the fundament of – and integral to – the political structure in the Near East during the MBA, and probably also during EBA IV (also cf. 5.2.1.3). After the fall of Mari, much of the historical narrative gets shrouded in yet another period of textual dearth (Durand 2004, p. 194) – and this point in time also defines the end of the predetermined temporal horizon for this dissertation.

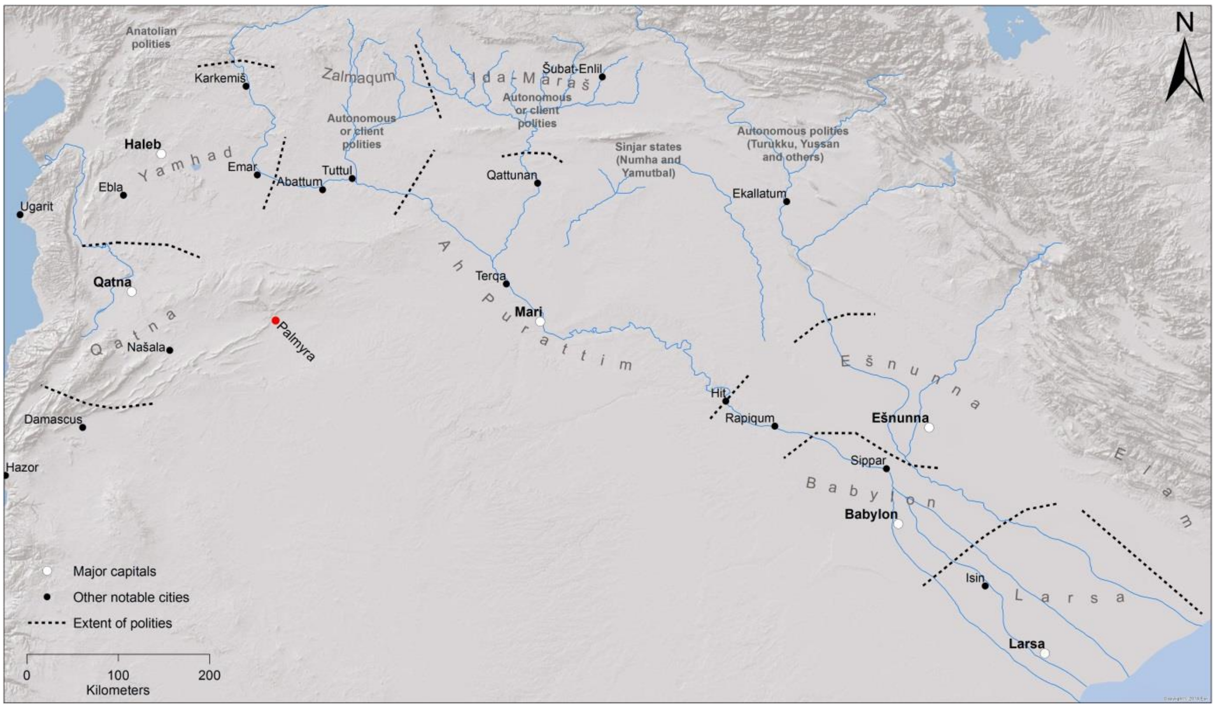



**Figure 3.7:** The six main political actors of the MBA II in the Near East, the approximate extent of their geopolitical influence, and the location of their respective centres during the time of the Mari archives. In addition, non-incorporated entities, like Zalmaqum, are marked. Even though the latter enjoyed relative autonomy, these nevertheless had affiliations along tribal lines toward some of the larger ones, just like the Ida-Maraš was either affiliated or dependent on the Mari dynasty (cf. 5.3.2.1). However, as the structural basis of power during the EBA-MBA mainly was personal authority and/or influence over populations and not spatially founded, it would be inaccurate to illustrate the largest actors according to geographical extent (also cf. 5.2.1.3). Instead, their main range of influence along the river valleys and across the more densely populated areas of the Near East is approximatedly marked.

## 3.5 Summary and conclusions

The geopolitical development of the Near East seems to have been characterised by a cyclical pattern of centralisation and fragmentation. Fragmentations were usually followed by the emergence of a local dynasty or cessation from an overlord or king by an erstwhile governor or vassal. In time, most of these were again swept up by a new expanding power, generally in competition with a small number of other similar actors. However, due to the vast physical geography of the region and the structure of power in the EBA and MBA political system, which mainly was based on personal authority, tribal affiliation, and a network of patron-client relationships, most large polities did not survive more than one or two centuries. The geopolitical structure based on large continuous states and dynasties first emerged in the Near East during the LBA (Charpin 2004, p. 201 – for more on this topic cf. 5.2.1.3). Thus, the long reigns of Ipiq-Adad II of Ešnunna, Šamši-Addu in the kingdom of Upper Mesopotamia, or Rim-Sin of Larsa could have been essential to the success and regional power of these states. Unfortunately, the specific developments in Syria between EBA IVa and MBA II are generally rather obscure, without the option for a detailed analysis, but the few glimpses obtained seem to suggest a geopolitical development roughly similar or possibly parallel to that of southern Mesopotamia. Mari was probably larger than many other cities in the region for much of the time and expanded to comprise the Ah Purattim state regularly, while Ebla enjoyed the same primate position on the Syrian plains, although being eclipsed by Qatna and Yamhad during MBA I. The geopolitical network of influence and power probably fluctuated in pattern parallel to that of the Alluvium, with regional fragmentation being replaced by emerging consolidation under a few powerful actors, often in time followed by yet another period of political fragmentation. The underlying structure of personal authority and tribal affiliations without the necessary means for direct control outside a limited area around the centra could have been the reason for such a cyclical pattern.

However, it must be emphasised that with regard to Syria itself, much of the geopolitical narrative needs to be characterised as tentative, or at best suggestive. Without textual material for most of the period in question, only hints and inferences from outside sources shed light on its the diachronic developments. While the narrative presented here is of contextual value for this synthetic approach, it is also an important backdrop for themes to come, mainly under 5.2 and 5.3. But before this, I will turn to the main corpus of data collected for this study - the new non-synthetic information, so to speak – namely the archaeological ground survey carried out by the Palmyrena project and the subsequent extensive satellite survey of the Palmyrene, although I also will draw upon certain other surveys and the limited amount of excavations carried out by other archaeologists working in this region during the last two decades.

# 4 The Palmyrena survey and EBA-MBA archaeology in central Syria

Archaeological research on central Syrian matters regarding the Bronze Age is a relatively recent undertaking. Most investigations into EBA and MBA societies in the region have focused on other areas and topics, e.g. the settlement sites in the major river valleys, on the Syrian plain, and in the Habur triangle. Monuments and material remains associated with mobile pastoralists in a steppe environment have been conspicuously absent from the archaeological corpus, apart from suggestions linking such groups to the *kranzhügel* sites of the western Jezire (cf. 5.2.2.2) and the odd connection between sites in the steppe – usually the oft-mentioned Jebelet el-Beda – and mobile pastoralists inhabiting the Jebel Abd el-Aziz region (cf. Wossink 2009, pp. 112-113, with references). However, outside of Syria there has been a somewhat longer tradition for research on arid landscape structures which seemingly could be attributed to mobile groups, such as in Jordan, Sinai, and the Negev desert (e.g. Haiman 1982; Helms & Betts 1987; Zarins 1992). But the steppe – and particularly the Palmyrene and Jebel Bishri – is in fact brimming with archaeological monuments to which associations specifically with mobile groups have been suggested in recent years, and research carried out in the past decade or so has shown that many of them should in fact be chronologically placed in the 3rd and early 2nd millennium BCE, and particularly in the EBA IV to early MBA.

This chapter aims to present the data collected by the Palmyrena survey in the highlands north of Palmyra, as well as the subsequent satellite imagery survey conducted for the purposes of this dissertation, and analyse these structures according to their archaeological contexts and in relation to the Palmyrene landscape. Most of the material is assembled in appendices 1-4, mainly in order to make it available for reference, but also to prevent the minute details from obscuring or confusing the interpretations and discussions presented in the text. First, I will describe the assemblage of archaeological structures found in Near Eastern arid landscapes, and then present the tumuli surveyed on the ground Palmyrena in general and define certain of their structural and contextual aspects (cf. 4.1). Following this, I will analyse them according to these definitions and to patterns in the landscape (cf. 4.2). Then I will turn to the topic of remotely-sensed surveying, which has been a boon to this study, escpecially since any archaeological work in Syria has been suspended since May of 2011. The first and shorter part will present results from the study of acquired high-resolution satellite imagery of the area surveyed by the Palmyrena project (cf. 4.3), although the main survey was carried out on Google Earth imagery, around which some considerations on method and potential issues will be outlined (cf. 4.4). The results from this investigation is divided according to structure types and assembled (cf. 4.5), each followed by a lengthier discussion on the interpretation and function. The penultimate subchapter (cf. 4.6) concerns chronological aspects of the Palmyrene structures, and also outlines the method and results of the OSL dating carried out by the Palmyrena project. Finally, I will turn to other archaeological projects with similar thematic and geographical scope (cf. 4.7) to consider comparative aspects of structure, context, and chronology – all for the purpose of understanding and interpreting the Palmyrene monuments.

## 4.1 Defining Palmyrene prehistoric archaeology

### 4.1.1 The Bronze Age technocomplex: Defining Palmyrene archaeological structures

Bradbury (2011) carried out an extensive study of stone monuments associated with burials in the Levant as part of a research project in the basaltic region north of Homs, hereafter called the Homs NSA (cf. Philip & Bradbury 2010; Philip et al. 2011; Bradbury 2011 – cf. **Figure 4.55**, areas A and B). She tried to answer questions about functionality in a diachronic context and the possibilities and potential for typology, as the monuments vary greatly in size and shape and their relation to the wider landscape. She argued that there are indications of initial erection of such monuments during the 4$^{th}$-3$^{rd}$ millennium BCE, although she also pointed out that problems had emerged when the project had attempted to attribute size and shape to chronology (Bradbury 2011, p. 41). The Palmyrena project has documented hundreds of burial monuments in the central Syrian highlands (cf. 4.2), with thousands more having been mapped via satellite imagery (cf. 4.3 and 4.5), albeit one should strictly characterise the latter as hypothetical or probable tumuli. In addition, excluding clearly datable Roman, Byzantine, or Islamic structures and complexes, other archaeological structures also found and documented include a few kites, a large number of what has provisionally been termed *corrals* (cf. Meyer 2008), as well as some structures of unknown function and date (cf. Anfinset 2009; 2013; Meyer 2009; 2011). Subsequently, several hundreds more such monuments have been surveyed via commercially available satellite images and Google Earth (cf. 4.3, 4.4, and 4.5). This troika of archaeological remains is actually constituting what Zarins (1992, p. 50) characterised as the Chalcolithic and Early Bronze Age *pastoral nomadic technocomplex* of the vast Near Eastern arid zone. The first type he termed *stone circles*, which he defined to include a large variety in type and construction, such as simple or complex structures, from large isolated stone rings to smaller ones containing a number of interlocking stone enclosures. Both of these extremes he added can be furnished with internal subdivisions and/or attached external rows of stone. The second type was *tumuli*, which can take a number of forms, as will also be shown below. They can exist in isolation, as cemeteries or as parts of stone circle complexes. He emphasised their location along ridgelines, but also associated them with proximity to material for construction. The third part of the technocomplex was *kites*, which in the days of Zarins counted a lot fewer examples than is the case today (Kennedy 2012 – cf. 4.5.5.1 and **Figure 4.38**), and had at the time mainly been recorded in Saudi-Arabia and Jordan. However, he mentioned that Poidebard (1934) had documented several kites in the region northeast of Damascus as well as along the Strata Diocletiana between Palmyra and Suhne, thinking they were Roman fortifications which subsequently were being used by Bedouins in the area (also cf. Kennedy 2012, pp. 147-148). Lastly, and slightly on the side of the abovementioned structures, Zarins also included the possibility of stone-built and stone-filled platforms in his pastoral nomadic technocomplex. Although the terminology on kites will be kept in this chapter, due to its well-known and often applied usage in archaeological research, the features sometimes called corrals will here be termed *stone enclosures*, to separate its function from husbandry and the connotation to animal pens which is inherent in *corral* as a designation, as well as avoiding connotations associated with the often ritually laden term *stone circles*, notwithstanding the fact that only a minority of them actually take the shape of a true circle.

While there are some variations within the group of burial monuments, nearly all of them are what Bradbury called *cairns/tumuli* (Bradbury 2011, p. 677, appendix 3.2), although their contexts differ quite dramatically. Of course, due to her rather wide thematic and geographical focus, consisting of all types of stone funerary monuments in 150 km$^2$ of the Homs NSA, nearly 21000 km$^2$ in the Vanishing Landscape Region stretching into the Palmyrene (cf. Bradbury 2011, p. 44, fig. 1.1), as well as integrating the Hawran, Jawlan, and Negev for comparative purposes (Bradbury 2011, p. 42), her typology is expected to have varied greatly. She also described certain *irregular stone structures*, which seem to be similar to the

Palmyrene stone enclosures (Bradbury 2011, pp. 267-269; fig. 4.29 below). Initially, this makes many of the definitions and characteristics in her thesis useful for the current study, but as her data draw on the Levant and western Syria with no burial structures from central parts of Syria included at all (cf. Bradbury 2011, p. 133, fig. 3.12), there is arguably a need to independently consider definitions and characterisations for the Palmyrene tumuli themselves. Bradbury also argued that multifaceted variations in morphology and landscape contexts would be a preferred approach to the rigid typological classifications of previous research (Bradbury 2011, p. 118). Because the Palmyrena project suffers from lack of secure dating evidence for burial structures in the dry steppe, apart from a few tentative indications, mostly from contexts of a secondary character (e.g. pottery scatter around a cairn, cf. 4.6.1), typological variation with the perspective suggested by Bradbury could at least carry some potential for yielding answers. Additionally, the project had from the start the aim of applying a different tactic to the chronology of these structures – optically stimulated luminescence (OSL) – which will be explained further below (cf. 4.6.2). The initial hypothesis (cf. 1.2.1) is that the great number of cairn structures in the Palmyrene highlands was erected mainly by Bronze Age mobile pastoralists who due to climatic changes, inter-group relations, and/or the general sociopolitical developments in the Near East felt the need to mark their presence, identity, and possibly territory in the landscape. With the main issue being chronology, I will here define the variations within the tumulus typology, and later try to integrate these with chronology based on pottery, comparisons, and possibly radiometric dating. I do partly agree with Bradbury (2011, p. 120) that morphology could be not just associated with ethnicity or regional geography, but in fact also be attributed to chronology or even the result of thousands of years of landscape use and habitation. I consciously use the term *tumuli* here as a designation for the burial monuments of the survey area, meaning a heap of material (earth and/or rocks) constituting an archaeological structure, rather than using *cairn*, which below will be applied to denote more specifically a pile of rocks and blocks (cf. 4.1.3). As part of Zarins' mobile pastoralist technocomplex, I will also subsequently consider various aspects regarding stone enclosures and kites in the Palmyrene.

### 4.1.2 Survey area and methods

The concession area provided by the Director General of Antiquities and Museums of Syria (DGAM) for the Palmyrena project stretched from the wide plain Sahl Feif el Mazraa, which lies just south of the mountain ranges Jebel Abyad and Jebel Homr ez Jazal and north-

northwestward for c. 85 km in a c. 25 km wide inverted S-shape toward the plain of Sahl Isriyeh (Meyer 2009, p. 4; cf. appendix 2, pp. I-II). The main topographical features (i.e. large wadis, highland and mountain ranges) of the area are (in the order south to north, west to east):

- Southern half: Sahl Feif el Mazraa; Jebel Homr ez Jazal, Wadi Takara, Jebel Abyad E, and Wadi Abyad; Jazal; Jebel Abyad W; Wadi Dalil, Wadi Massadeh, and Jebel al Matna; Jebel Shaar, Wadi Khabar, Jebel Merah, and Wadi Rahawi.

- Northern half: Wadi Qutayr and Jebel Yatimeh; Jebel Sawwanat Hassidah and Jebel Sha'ir al Ghawr; Sawwanat Hussayeh, Jebel Saqraq, and Jebel Khashabiyeh; Wadi Hussayeh; Sahl Isriyeh.

The main method for surveying such a large area during the course of three years was based on previous observations in the field with regard to archaeological structures and the practicalities of topography (Meyer 2008). It comprised of driving four-wheel drive offroad vehicles in areas where this was possible, mainly along wadi-plains and in gentle foothills, while the mountain ridges and narrow wadis were fieldwalked. Obviously, this method would not be adequate for an exhaustive survey, but nor was it intended to be one. The aim was rather to cover as much ground as possible during three surveys of about four weeks each, with priority on previously established *hot-spots*, which e.g. in the case of tumuli in the area was apparently high ground, spurs, and ridges. The project had mainly acquired permission for surface documentation of archaeological structures, and we were therefore unable to carry out any form of excavation in association with these. All archaeological material found and recorded by the project, such as flint tools and pottery, would strictly have to be defined as surface finds, albeit usually recovered in spatial proximity to and probably associated with an archaeological structure. However, the project did acquire permission to carry out the excavation of local sondage trenches to gain access to buried soil/sand beneath outer structural blocks of a limited number of tumuli for the extraction of OSL dating samples (cf. 4.6.2).

In reality, the Palmyrena project could only execute two seasons of field work, as the 2010 season was cancelled due to Syrian bureaucracy and governmental plans for a dam on the Euphrates, which in effect had the result of pulling out local representatives from small- and medium-sized archaeological projects, thus making field work legally impossible for us that year. However, in 2009 and 2011, field work was generally carried out in full, although the operations in the Palmyrene toward the end of April 2011 had to be abandoned due to the onset of heavy rain, creating hazardous conditions in the steppe, while some subsequent analyses during the same season was cut short by the increasing intensity of demonstrations and political conflict experienced in Syria as a consequence of the Arab Spring. The result of this was that only certain parts of the southern regions of the concession area were surveyed extensively. The main areas subjected to investigations were Wadi Takara, Jebel Abyad, Jazal, parts of Jebel Homr ez Jazal, parts of Wadi Dalil and Wadi Massadeh, and southwestern half of Jebel Merah (cf. appendices 2, 3, and 4). Additionally, the north tip of Jebel Merah had been briefly surveyed during a prospection in 2008 (cf. Meyer 2008).

The method applied in the field consisted of locating archaeological structures, which for the present work were mostly presumed burial monuments, and at the site record all visible tumuli and any associated refurbishments by filling out a site form which included GPS coordinates, height above sea level, condition, and character of structure, as well as site location in the landscape and nearby topographical features. Photographies were taken of the monument in all four compass directions, if possible, with a meter-long measurement rod visible for scale, the size of the structure measured in plan on the north/south and east/west lines, and maximum height estimated in certain cases. In addition, a field walk was usually carried out on and around the tumuli to record any surface scatter. The meticulousness of the survey enabled a detailed post-analysis of all the recorded structures, which totaled 404 burial monuments, as well as a small number of structures of uncertain character. One kite was also found, surveyed, and recorded in southern Jebel Merah in 2011, while a number of stone enclosures were also discovered as part of the search for tumuli, although not actually prioritised for documentation during the 2009 and 2011 campaigns (cf. Anfinset 2009; 2013). However, the 2008 prospection did record a small number of stone enclosures at Al-Matna, which in some cases were associated with tumuli located at the northern entrance of Wadi al Masek (cf. Meyer 2008, pp. 44-55).

### 4.1.3 Tumulus typology

Initially, it must be pointed out that Philip and Bradbury (2010, pp. 141-142) have indeed questioned the common use of the term *tumuli* regarding structures like those presented below, although they specifically discussed cairn-type monuments in the Homs NSA. They argued that the term connotes a funerary function which for many instances is not clearly demonstrated through excavation or other archaeological investigation. Arguably, their concerns are valid, particularly for agricultural regions in their area further west, as the heaps of rock could be clearance cairns or possibly serving a function as beacon or landmark, or have other, unknown purposes (cf. 5.4.1 and 5.4.2). However, the archaeological structures surveyed in the Palmyrene seem to have served as landmarks integrated with the landscape and as burial monuments. This has also been argued by Bonacossi and Iamoni (2012, p. 31), based on their general pattern of topographical location. Many of the disturbed and looted examples of Palmyrene tumuli frequently exhibit a cist or chamber, which heavily implies a tomb or a funerary function of some sort, and the many forms of refurbishments which often are associated with these structures also indicate that they were monuments of ritual importance. Additionally, the general aridity and topography of the region combined with the location of these structures most likely excludes an agricultural phenomenon, while the interrelation of many of them suggests a funerary function, as has indeed also been determined by other archaeological researchers working in this specific region and environment (cf. Bonacossi & Iamoni 2012; Fujii & Adachi 2010; Nishiaki 2010; Numoto & Kume 2010; Lönnqvist 2010 – also cf. 4.7). The collective term for burial monuments made up of a pile of rocks/blocks and/or earth will here be *tumuli* (sing. *tumulus*) (e.g. Bonacossi & Iamoni 2012, p. 45, note 59), to exclusively indicate shape and probable function. Another term often used in this context is *cairn* (e.g. Nishiaki 2010; Fujii & Adachi 2010) or *cairn/tumulus* (e.g. Lönnqvist 2010), but because the analysis below will incorporate this term to define a tumulus consisting of mostly rocks/blocks and very little soil/earth, I will avoid using *cairn* as denoting Palmyrene burial monuments in general, while the *cairn/tumulus* designation will be dropped for practical reasons. However, in some of the map legends in this chapter, one could encounter the word cairn, although the meaning is generally supposed to be *tumulus*[7].

[7] This mainly concerns **Figure 4.16**, **Figure 4.17**, **Figure 4.52**, and appendix 2.

**Figure 4.1:** Burial monument of the cairn type (appendix 1, no. 255), mainly a pile of stones and blocks stretching up to 9 m in diameter (photo: Torbjørn Preus Schou, 2011).

The Palmyrene tumuli can roughly be divided into three type-groups. The first consists structures shaped like a large pile of rubble, blocks and cobbles, circular in plan and roughly triangular or dome-like in profile. They are of varying size, from modest (i.e. here defined from three to nine meters in diameter) to monumental (over nine meters in diameter and often over one meter of height remaining). The designation for these structures will be *cairns* concerning the former type (**Figure 4.1**), due to the fact that they mainly consist of a stones, as opposed to the construction of the other types, while the monumental-sized cairns will be termed *monumental*, to separate these from the smaller ones and to indicate that they often are visible from far away (**Figure 4.2**). Features or refurbishments which often are associated with this latter type are one or more foot chains (cf. **Figure 4.2**) and sometimes auxiliary cairns scattered around them (cf. **Figure 4.49**). As most have been opened for looting prior to their discovery by the survey team, it also seems that many include a rectangular chamber of a cist-like character, i.e. lined with stone slabs. Both cairns and monumentals are also in many cases defined by a fundament of blocks securely embedded in the ground forming a circular perimeter, which often defines their size in plan. This fundament has in the case of monumentals sometimes a second or even third course of blocks laid on top of it, giving them a turret-like structural appearance, although usually of a much larger size than the turret-type tumuli presented below, and it also often occurs as an internal structural feature inside a pile of medium- to large-sized rocks rather than an external wall-like structure. On the other hand, the very definition of the cairn-type includes great variation, and denotes in effect all tumuli *not* categorised here as mounds, turrets, or monumentals.

**Figure 4.2:** Tumulus of the monumental type (appendix 1, no. 266), including a substantial foot chain. This type is basically defined as a cairn, only it is larger than 9 m in diameter and sometimes well over 1 m tall. Monumentals are often located on peaks along the highest mountain ridges, although not exclusively (cf. **Figure 4.11** – left) (photo: Torbjørn Preus Schou, 2011).

The second type-group includes low tumuli-mounds, mostly consisting of cobbles mixed with earth. Again, their shape in plan is circular, while the profile is of a low, gentle, dome-like character and they will here be termed *mounds*, due to their mix of cobbles and earth, although they can also feature some rocks (**Figure 4.3**). They vary quite a lot in size, but are usually not over 10 m in diameter. Even though these can surpass 9 m in plan, they are too low to justify a classification as monumental. The most striking other aspects with this group is that they generally occur in clusters and are not *necessarily* looted, possibly due to their more unassuming shape and size. Quite a few of them also feature a small pile of stones in their centre, which often look more like a genuine feature than a later addition or the result of looting. This pile also acts like some sort of marker and make them stand out better in the local topography than the ones without such piles, even today.

**Figure 4.3:** Two burial monuments of the mound type within the same cemetery (appendix 1, nos. 366 and 361 – left to right), located in the Jebel Merah mountain pass of Taniyet ez Zerr (cf. **Figure 4.16**). They are low and unassuming, and consist of earth and smaller rocks (photos: Torbjørn Preus Schou, 2011).

The third main type-group is what here will be termed *turrets*. They are quite different from the other two, in that they are built up of dressed, mainly rectangular blocks in a circular dry-stone wall construction of three to four or more courses, resulting in what looks like a compact turret (**Figure 4.4**). Within the walls of these is a pile of small- to medium-sized rocks, which comprises the *fill* of the structure, so to speak. This heap usually projects somewhat above the wall line creating a dome-like shape, inferred from the one or two undisturbed examples documented by the Palmyrena project. Looted tumuli of this type often exhibit a medium-sized central chamber (c. 100 x 100 cm) with two straight and two curving internal dry-stone wall sides. Generally, turrets stand in isolation, with tens or hundreds of meters to the next tumulus of similar construction, and lack outer refurbishments. Some turrets, although mostly smaller than nine meters in diameter, can in cases of less disturbed condition exceed one meter in height, giving them an even more pronounced turret-like character.

**Figure 4.4:** Burial monument of the turret type (appendix 1, no. 408 – left), found in isolation on a lofty spur on the west side of Jebel Merah. The looted examples exhibited a burial chamber of curvilinear shape (appendix 1, no. 265 – right), built up of dry-stone walls (photos: Torbjørn Preus Schou, 2011).

### 4.1.4 Communicational aspects, condition, and distributional contexts

Burial monuments occur in various topographic contexts, which can have a large effect on their visibility and resulting communicative function. While there are no sure ways of knowing which communication routes actually have been used throughout the millennia, there is at least the potential in analyses of archaeological structures with focus on the determinative aspect of topography for structuring routes and the communicative aspect of tumuli. Thus, those that are visible from afar, e.g. from down on the low-lying plains and wadis, have in appendix 1 been assigned the quality *farview*, while those lying on the plains, along the wadis, or on saddle ridges/narrow wadi passes defining cross-mountain routes have been given the quality *nearview*, meaning they carry a communicative quality, but only for travelers passing close by. However, many burial monuments have such a low-key character, either due to small size or topographic location, that their relation to communication routes from a topographic point of view is uncertain. The communicative context for these has merely been termed as *low*, to take a cautious approach in this respect. In between, I have defined a *midview* quality, signifying that a tumulus is neither located right next to a route nor possible to see from a distance of several kilometers away on the high ridges, but is visible from one particular route or point of transition (e.g. a pass on a mountain saddle), lying some dozens or a few hundred meters away. The reason is also here usually modest size and position below ridgelines. However, complexes of burial monuments do constitute a larger structure and increased visual functionality than the individual tumuli they are comprised of, and thus can actually be visible from afar, even though their parts are of modest size. Usually, in these instances the visibility is defined by the element with highest communicative function. This factor would of course only relate to the purely mundane visual function of the tumuli, although I acknowledge that there probably also was a ritual or spiritual quality to them. While this must have formed an inherent part of the life and landscape of ancient societies (cf. 5.4), it is nearly impossible for us to discern in any detail today.

The state of condition for the burial monuments in the Palmyrene indicates that they in nearly all cases have been looted, with the environment not even having had time to weather the rock scatter from the plundering in some instances (*recently looted*), suggesting violation of the structural integrity of a fairly recent date. However, the tumuli could also have experienced several separate such occurrences through the ages (cf. 5.4.2 and text **5.25**). Another common form of disturbance is the presence of structures constructed from the rocks of the monument, such as windbreaks, as well as Arabian graffiti on incorporated slabs. Bradbury (2011, pp. 168-172) synthesised various manifestations of reuse in association with tumulus constructions in the Homs NSA and reported by $19^{th}$ century CE travelers, and also mentioned the example of such secondary inscriptions – Safaitic or modern Arabic – on ancient tumuli. Additionally, modern Bedouin graves can constitute another form of reuse, and she argued that many probably have been placed near ancient tumuli as a conscious and deliberate choice, rather than just reflecting recirculation of material. The other commonly encountered types she mentioned are wind shelters or hunting hides erected by shepherds or outcasts. All these manifestations of reuse are fairly frequently found alongside or on top of Palmyrene tumuli (cf. appendix 1), although shelters are more common than Bedouin graves (but cf. **Figure 4.50**). The latter usually appear in clusters at specific points in the landscape where also tumuli can be found, rather than being arbitrarily associated with tumuli in particular. Some tumuli are characterised as *heavily disturbed* (**Figure 4.5** – left), i.e. there are not just one or more looting pits, but not much is left of the original construction and the material is scattered around, although the fundament, some filling stones and the general construction can usually still be discerned. In a few instances where virtually nothing is left of a tumulus, it has been characterised as *totally destroyed* (**Figure 4.5** – right). Most of the structures have been *disturbed* in some way, and been described as such in the analysis (cf. appendix 1), but a few examples seem to show little or indeed no disturbance at all. These are still described as *slightly disturbed*, although the minor scatter of rocks associated with these could merely have been the result of natural processes (e.g. wind), with no evidence for actual looting having taken place.

**Figure 4.5:** Pictures of heavily disturbed (appendix 1, no. 164 – left) and totally destroyed (appendix 1, no. 165 – right) tumuli along the northern ridge of Jebel Abyad (photo: Torbjørn Preus Schou, 2011).

The Palmyrene tumuli occur in clusters of varying numbers and types as well as in isolation. Those that have been classified as *isolated* are defined as not having any other tumulus structures lying in their vicinity, i.e. within c. 30-40 m. Thus, they can have a relation to other burial monuments, but on an elevated level and not within their immediate surroundings. For instance, there is a clear trend of monumentals, cairns, and turrets lying along the high mountain ridges, but separated by several tens or even hundreds of meters. The other analytical descriptions used for the interrelational context of tumuli in the region are classification into *groups of two*, *groups of three*, as well as *complexes*, the latter of which includes any cluster of burial monuments incorporating more than three elements. Finally, a number of recurring features have been noted as part of the survey and analysis, which seem to have some ritual or funerary function in relation to the tumuli (**Figure 4.6**). They are generally structures outside or within certain groups or complexes of burial monuments, but not being direct parts of any of the tumuli structures themselves. These are:

a) *Foot chains* enclosing or cutting off a group/complex

b) Rectangular *platforms* or wall-like structures within a group/complex

c) *Stone circles* associated with a group/complex

d) *Stone rows* leading toward a group/complex

These features do not occur very often, but in some of the cases their expression is certainly striking enough to merit mention in the analysis (cf. **Figure 4.6** – left), as well as the structural recurrence in itself suggests them being more than one-off events. Appendix 1 presents the complete list of tumuli structures with descriptions on size, type, refurbishments, reuse, and condition, everything with references to structure numbers in Meyer (2008), Anfinset (2009), and Anfinset (2013).

By applying Google Earth (cf. 4.4) it has also been possible to correct for obvious measurement errors, particularly regarding elevation. There are some instances where both pictures and topography in Google Earth clearly do not match the elevation numbers in the reports (cf. Anfinset 2009; 2013), e.g. when closely situated tumuli seemingly differ in elevation by eight to ten meters, and this data must therefore have come to pass due to situational uncertainty in the GPS. I have corrected these numbers as a consequence of the abovementioned factors and my own subjective evaluation of the site. However, the difference between the reports and my evaluation rarely exceeds ten meters in elevation, usually being between five to eight meters, and is mostly for descriptive purposes here, rather than actual analytical ones.

### 4.1.5 Comments on chronology

The post-fieldwork study of the tumuli has been carried out in a very thorough fashion, with notes on any reuse or rearrangements of the monuments (see above), which in most cases clearly have occurred in more recent times. However, while the Bronze Age date of these monuments is hypothetical in most cases, occasionally some evidence of reuse in Roman times has been observed, showing at least a pre-Classical origin of these tumuli. Additionally, pottery sherds collected by field walking around some of the structures (cf. 4.6.1 and **Figure 4.46**) also suggest a tentative connection with them and thus a date of approximately EBA IV, although it must be pointed out that *all* the finds collected by the prehistoric team of the Palmyrena survey are stray finds and of a secondary nature, which *possibly* originated from burial contexts within the structures and ended up outside these tumuli as a result of looting at some point in time. Some material collected in this manner is clearly of a Roman or Byzantine date, and other Islamic or even Ottoman. While at least the Classical forms of pottery could conceivably have originated from the burial chamber, the monuments and complexes could also have been focus for other, less disruptive activities through the ages, e.g. acting as mere resting areas for shepherds or soldiers being drawn toward them as landmarks in the landscape. This emphasises that the context and provenance of the pottery scatter is very uncertain, and hence the date of the structures being derived from such material would have to be considered tentative or at best provisional. The pattern of mainly Roman or Byzantine pottery combined with EBA IV material is also reflected in the region as a whole, and suggests that these two periods constituted distinct times of expansion and increased activity on the fringe and interior of the arid steppe, compared to other archaeological periods in central Syria, a picture which also has been argued to be the case for the basaltic region further west (cf. Philip & Bradbury 2010, pp. 158-159; Bradbury 2011, p. 244), although MBA should probably also be included in this picture (cf. 4.7.3). The dismissal of Islamic and Ottoman material having derived from the burial chamber is due to the presumed major changes in disposal of the dead occurring as a consequence of the introduction of Islam in the region. Certain results from relative dating of the tumuli can also be acquired from spatial and structural associations within a complex. It is for instance probable that large, central tumuli with a clear topographical and contextual focus are of a higher age than smaller ones surrounding them, due to the generally accepted view that mobile pastoralist groups focus on ancestor worship and lineage in their funerary arrangements, linking burial monuments up to family or tribal lines by virtue of close spatial association with the monument of a real or perceived ancestor (e.g. Meyer 2010, p. 161; Numoto & Yume 2010, pp. 55-57 – also cf. 5.4).

**Figure 4.6:** Pictures showing examples of two types of external refurbishments associated with Palmyrene burial monuments. Left: Extensive burial complex (appendix 1, nos. 30- 31) in Wadi Takara with stone rows, foot chains and other features (cf. Anfinset 2009, pp. 67-68) (photo: Nils Anfinset, 2009). Right: Rectangular platform associated with two tumuli in Jebel Merah (appendix 1, nos. 316-17) (photo: Torbjørn Preus Schou, 2011).

## 4.2 Typological and contextual analyses of Palmyrene tumuli

### 4.2.1 The 2011 fieldwork season – statistics

The tumuli recorded during April of 2011 in the Palmyrene (Anfinset 2013) are located in the western part of Jebel Abyad (i.e. west of Wadi al Masek – cf. appendix 4, p. V) (n=32) and in the southern two-thirds of Jebel Merah (n=169) (cf. appendix 4, p. III), in addition to a small number found on a hillock in Wadi Dalil (n=6) and on a free-standing hill there (n=4), some lying on the watershed escarpment (n=8) between Wadi Abyad and Wadi Massadeh (cf. appendix 4, p. IV), and one found on a hillock in Wadi Khabar (cf. appendix 4, p. III). The ones surveyed in Jebel Abyad are located along the northern ridge, apart from four which lay on the elevated mesas in the southern part of the range, overlooking the oasis of Jazal. The tumuli in Jebel Merah are found along the foothill ridges and spurs, on the mountain ridges up toward the mountain pass of Taniyet ez Zerr, and north of this on western spurs of the range projecting into the wide wadi-plain of Wadi Khabar.

| Type vs. year | **2011**<br>Number (percentage) | **2009**<br>Number (percentage) | **Total**<br>Number (percentage) |
|---|---|---|---|
| Cairn | *110 (50.0 %)* | *88 (58.3 %)* | *198 (53.4 %)* |
| Monumental | *15 (6.8 %)* | *25 (16.6 %)* | *40 (10.8 %)* |
| Mound | *34 (15.5 %)* | *10 (6.6 %)* | *44 (11.9 %)* |
| Turret | *15 (6.8 %)* | *4 (2.6 %)* | *19 (5.1 %)* |
| Cairn/mound | *27 (12.3 %)* | *7 (4.6 %)* | *34 (9.2 %)* |
| Cairn/turret | *17 (7.7 %)* | *14 (9.3 %)* | *31 (8.4 %)* |
| Tumulus | *2 (0.9 %)* | *3 (2.0 %)* | *5 (1.3 %)* |
| Total | *220 (100 %)* | *151 (100 %)* | *371 (100 %)* |

**Table 4.1:** Numbers according to the various tumulus types defined in 4.1.3 recorded during the ground survey of 2011 and 2009 by the Palmyrena team focusing mainly on prehistory. There seems to be some variation between the surveys, which could be attributable to the difference in geographical focus, although other explanations are also possible to envision.

The four types of archaeological burial structures defined under 4.1.3 constitute in all 174 of the total 236 tumuli recorded during the 2011 season (cf. **Table 4.1**). However, some of the tumuli are more difficult to clearly put in either categories and therefore here given the classifications *cairn/mound* (n=27/12.3 %) or *cairn/turret* (n=17/7.7 %). This is mainly due to erring on the side of caution, and many of them should probably be categorised as either mounds or turrets. Two of the remaining are only termed *tumulus*, due to a lack of photo and description (i.e. merely consisting of location coordinates), while 16 are uncertain as burial structures and hence categorised as *cairns?*. Of these, 13 are so closely associated with Roman sites/buildings that they probably rather are remnants of such structures (e.g. tumuli 274-84 located on a peak of Jebel Merah). For this reason they are here excluded from the statistics as such.

There seem to be certain contextual patterns with regard to tumuli types. With a couple of exceptions, *turrets* are as mentioned generally standing alone (i.e. over 40 m to the next tumulus), and often on sloping foothill or mountain ridge spurs. More specifically, they never occur in groups with other turrets, but can be found with one or more of the other types. However, if the cairn/turret group is included, they occur together in two instances in the 2011 material (appendix 1, nos. 168/170 and nos. 410/411), where one of them (168/170) include a true turret c. 25 m from a possible one. *Mounds* are mostly associated with collections of other tumuli, either other mounds or cairns, and are located either in foothill/plain transitional areas, wadis, or near saddles in the mountain ridges, right next to topographically determined communication routes. Several *monumentals* lie isolated along the highest mountain ridges and can be seen from afar, both due to location and size, while others constitute the central tumulus in a group or complex of burial structures in the foothill regions. The contexts of *cairns* include all of the topographical locations above, due to their wide definition. Incidentally, excluding the 16 structures uncertain as tumuli (the *cairns*?), 110 tumuli are characterised as lying isolated (50.0 %), 54 in groups of two (24.5 %), 27 in groups of three (12.3 %), and the remaining 29 (13.2 %) in complexes with more than three tumuli (i.e. groups of five, six, seven, and eleven) (cf. **Table 4.2**). The proportion of *cairns* (half of all tumuli) is not unexpected, again given that their definition is merely one of being a circular pile of rocks, with both pile and rocks varying greatly in sizes from one cairn to another, or even the characterisation as being not either of the other type-groups.

### 4.2.2 The 2009 fieldwork season and 2008 prospection – statistics

The fieldwork season for 2009 (Anfinset 2009; Meyer 2009), focused mainly on Jebel Abyad (n=33) (cf. appendix 4, p. V), as well as the area south of that mountain range, including Wadi al Masek, the main pass dividing Jebel Abyad which contains a small number of tumuli (n=6) (cf. appendix 4, p. VI), the area surrounding the Jazal oasis, which is quite densely packed (n=53), and the ridge of Jebel Homr ez Jazal (n=5) (cf. appendix 4, p. VIII) bordering on the important communication route of Wadi Takara. The edges of the eastern half of Jebel Abyad (n=24) and Wadi Takara itself (n=29) (cf. appendix 4, p. VII) were also surveyed during this season. In total, the number of surveyed tumuli amounts to 151 individual structures, excluding the ones which here are defined as *cairns?* (n=3). From the perspective of typology, again *cairns* constitute the majority of these (n=88/58.3 %), while *turrets* and *mounds* make out 2.6 % (n=4) and 6.6 % (n=10) respectively. The largest type group apart from the cairns is the *monumentals*, which number 25 (16.6 %). The more uncertain groups *cairn/turrets* (n=14/9.3 %), *cairn/mounds* (n=7/4.6 %), and *tumuli* (n=3/2.0 %) constitute the remainder of the burial structures documented during this survey year (table 4.1 – middle column).

| Archaeological context vs. year | **2011** Number (percentage) | **2009** Number (percentage) | **Total** Number (percentage) |
|---|---|---|---|
| Isolated | *110 (50 %)* | *60 (39.7 %)* | *170 (45.8 %)* |
| Group of two | *54 (24.5 %)* | *42 (27.8 %)* | *96 (25.9 %)* |
| Group of three | *27 (12.3 %)* | *12 (7.9 %)* | *39 (10.5 %)* |
| Complex (more than three tumuli) | *29 (13.2 %)* | *37 (24.5 %)* | *66 (17.8 %)* |

**Table 4.2:** The archaeological contexts of tumuli recorded during the 2011 and 2009 ground surveys. The definition of an isolated burial monument is here one which is situated at least 30 m from any other visible monument.

Evidently, there are differences between these two surveys with regard to typology. One explanation may be that while the analysis carried out on the 2011 material is based both on my own experience in the field, as well as the data collected and Google Earth topographical studies, the 2009 survey was carried out without my participation, and hence the analysis of those results is here exclusively based on pictures, Google Earth topography, and data forms filled out by the survey team present in the field. This may seem like a slight difference, but to actually have been on the ground is quite important for the perception of landscape and tumulus shape and/or size. Another reason can be that larger parts of the cairn/turret or cairn/mound data set from the 2009 survey actually are turrets and mounds than is the case from the 2011 material. However, the proportion of mounds to the total would still be somewhat lower for the 2009 material, while the proportion of monumental tumuli is definitely higher that year. If including all the ambiguous tumuli (i.e. cairn/turrets and cairn/mounds) in their respective clearly defined groups (i.e. turrets and mounds), the proportion of the mounds would be 27.8 % for 2011 and only 11.2 % for 2009, while the percentages of turrets would amount to 14.5 % for 2011 and 11.9 % for 2009, although the actual proportion may of course also lie anywhere between these percentages and the ones for clear mounds and turrets. Finally, an explanation may also be that there are combinations of geographical and topographical differences between the various tumulus type-groups which are detected in these otherwise dry statistics. For instance, there is a markedly larger group of turrets located in the mountain range of Jebel Merah (14 turrets and 15 cairn/turrets), than is the case for Jebel Abyad (one turret and eight cairn/turrets) and Jazal (four turrets and eight cairn/turrets), and that the Palmyrena project started working in Jebel Merah in 2011 may have had an effect on the data concerning this type. Supporting this argument is the fact that there are at least two turrets in the 2008 material[8] from the northernmost foothills of Jebel Merah, suggesting that this tumulus type is more frequently occurring in that mountain range than in the areas further south. The many monumentals in the 2009 data can possibly be explained as wider scatter of construction material due to location in low-lying and more accessible areas for looting and disturbance, which in the field has been interpreted as larger size, while the monumentals of 2011 represent more accurately the true proportion of the total, since many more of these are located along the highest ridges of the region and thus are less accessible (see below). However, this explanation must be considered more speculative than the one concerning turret proportions.

The interrelational contexts of the 2009 tumuli are slightly different than that of the 2011 material (cf. **Table 4.2**). The isolated structures amount to 60 examples, which is 39.7 % of the total. Groups of two and groups of three constitute 27.8 % (n=42) and 7.9 % (12) respectively, while the remaining 37 (24.5 %) are associated in complexes, with three groups of four, one of five and six, and two groups of seven tumuli. The analyzed data for the 2009 and 2011 material is thus more in line with each other in this respect. Although there are

[8] The 2008 prospection data generally does not lend itself to analysis due to lack of documentation and is therefore not statistically included in this analysis (see below), although a few provisional points are possible to discern, e.g. the presence of at least two turrets among mostly tumuli.

minor variations, it is possible to argue that around half of the tumuli lie in isolation, i.e. with no other *visible* burial monuments in their immediate proximity. However, there could be several individual interments within the tumulus itself or possibly graves surrounding it without any demarcation visible today, but such aspects remain hypothetical without excavations. The pattern of interrelations regarding type-groups is also parallel, with e.g. turrets lying exclusively in isolation, although when including cairn/turrets there are some seemingly placed together in Jazal (cf. **Figure 4.10** – right, and appendix 1, nos. 61/62, 70/71, and 78/79). The proportion of groups of two is highly consistent, both seasons with c. 25 % of all documented examples. The next two categories are vaguer, but I will suggest that around 10 % of the tumuli lie in groups of three, while *approximately* one-fifth of all are associated with an archaeological context characterised as tumuli complexes or cemeteries.

| Type vs. preservation | **Slightly disturbed** | **Disturbed** | **Heavily disturbed** | **Totally destroyed** | **Unknown** |
|---|---|---|---|---|---|
| Cairn | *3 (1.5 %)* | *89 (44.9 %)* | *89 (44.9 %)* | *17 (8.6 %)* | *0* |
| Monumental | *4 (10.0 %)* | *28 (70. 0 %)* | *8 (20.0 %)* | *0* | *0* |
| Mound | *17 (38.6 %)* | *25 (56.8 %)* | *1 (2.3 %)* | *0* | *1 (2.3 %)* |
| Turret | *3 (15.8 %)* | *7 (36.8 %)* | *9 (47.4 %)* | *0* | *0* |
| Cairn/mound | *1 (2.9 %)* | *29 (85.3 %)* | *3 (8.8 %)* | *0* | *1 (2.9 %)* |
| Cairn/turret | *0* | *10 (32.3 %)* | *21 (67.7 %)* | *0* | *0* |
| Tumulus | *0* | *1 (20.0 %)* | *0* | *0* | *4 (80.0 %)* |
| Total | *28 (7.5 %)* | *189 (50.9 %)* | *131 (35.3 %)* | *17 (4.6 %)* | *6 (1.6 %)* |

**Table 4.3:** The table shows tumuli surveyed on the ground in 2011 and 2009 and their evaluated external condition status. There is a clear correlation between visibility, or rather association with a monument as a potential object for looting, and its preservation (for instance, the high percentage of merely slightly disturbed *mounds*).

Finally, there is a discernible pattern with regard to the amount of disturbance various type-groups have sustained through the ages (**Table 4.3**), and it has arguably to do with visibility and size, although apart from the statistics, location is also a key factor. This last aspect is mainly influenced by isolation and inaccessibility, with e.g. the three turrets under the heading *slightly disturbed* (generally implying *probably not looted*, cf. 4.1.4) being located on a high spur jutting out from the main ridge of Jebel Merah and hidden away from all apparent routes, probably making them seldom subject to visitation (cf. **Figure 4.4** – left). The same is the case for some of the monumentals along the loftiest peaks of the same mountain range, which were even given up by the survey team due to a tight time-frame in 2011. It is also possible that several of the tumuli classified as *disturbed* are to a large extent unplundered, with their construction material having been rearranged into windbreaks or other minor alterations, but not been violently overturned. This may for instance apply to several large monumentals, a group which seems to have escaped the worst destruction in many cases, probably due to lofty locations, but also to the much larger amount of work needed to get down into a potential burial chamber – e.g. outside easy reach of a lone shepherd. Turrets and cairns on the other hand have fared much worse, with size and construction probably being the foremost reason. Turrets are easy to overturn, where merely tipping one side wall will make the whole fill scatter downslope, while cairns, although varying in shape and size, carry an inherent, but unfortunate combination of being easy to spot, being obvious in probable structural *raison d'être*, relatively lightly constructed, and of modest size. Mounds have fared best of all the tumuli types with regard to looting and/or disturbance. They are generally not situated far from routes or even in high elevations, thus the main reason for their good condition must be their unassuming character, i.e. not associated with being burial monuments. Only a minute proportion of these have been subjected to *heavy disturbance*, and nearly two-fifths of them seem relatively untouched. The cairn/mounds have in larger degree been subjected to disturbance. However, this is to be expected, as several in this category are low, but have a small pile of rocks in their centre, probably marking them as burial structures, or they have a rockier fill than conventional mounds, causing their uncertainty in categorisation. Additionally, the shape of these two type-groups is also an advantageous trait when it comes to natural processes affecting the construction. Finally and fortunately, not many Palmyrene tumuli are characterised as *totally destroyed*, although they do exist (cf. **Figure 4.5** – right).

The prospection of the region carried out in 2008 (cf. Meyer 2008), resulted in the recording of a small number of tumuli in the northern entrance to Wadi al Masek (n=9) and a cluster lying in the northernmost foothills of Jebel Merah (n=24). However, the lack of systematic documentation via data forms and photography makes these tumuli unsuitable for the systematic typological classification carried out on the 2009 and 2011 material, with most of them only possible to categorise as *tumuli* (cf. note 8), notwithstanding the low number of cairns from this prospection.

### 4.2.3 Tumuli and topographical context

Analyses of the tumuli surveyed on the ground in the Jebel Abyad and Jebel Merah regions do in fact provide results regarding the topographical context and communicative aspects in the Palmyrene landscape. There is a clear association between burial monuments and communication lines in the southern part of the surveyed region. This part includes the mountain range of Jebel Abyad, the hills of Jebel Homr ej Jazal, the valleys of Wadi Dalil, Wadi Massadeh and Wadi Takara, and the oasis of Jazal with its surrounding hillocks (collectively termed the Jebel Abyad region). Topographic features in this area which stand out as being associated with tumuli clusters surveyed on the ground are (cf. **Figure 4.7**):

a) Mountain and foothill ridges in general, but particularly those running parallel with wadis and occasionally falling steeply down into them (e.g. the northern wall of Jebel Abyad – see also fig. 4.8).

b) The banks of certain wadis and slightly higher ground around them (e.g. along Wadi Takara).

c) Entrances to passes crossing mountain ranges via narrow wadis (e.g. both ends of Wadi al Masek).

d) Crossroads and special natural features, such as wells or springs (e.g. the eastern and central parts of Jazal).

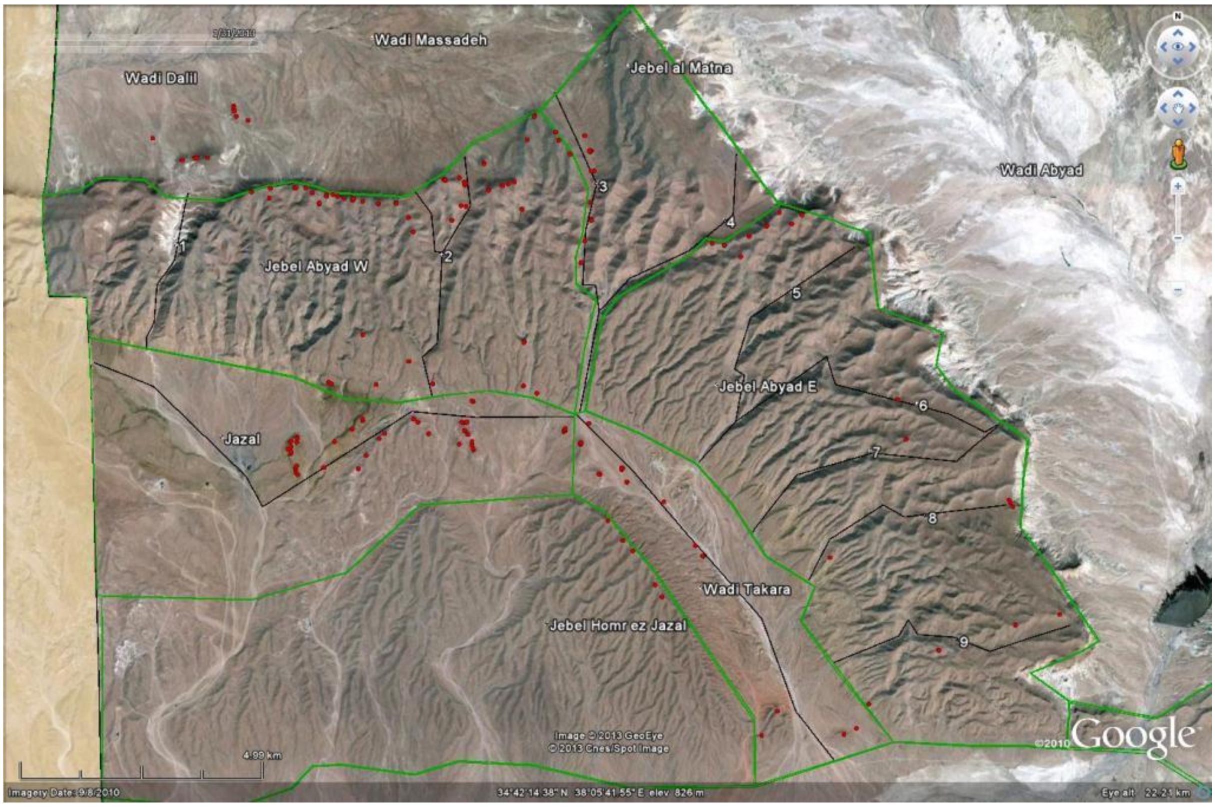



**Figure 4.7:** Satellite view of Jebel Abyad and surrounding areas with tumuli surveyed during the campaigns of 2009 and 2011, as well as the prospection of 2008 in the northern opening of Wadi al Masek. In addition to the hillocks around the oasis of Jazal and important route of the medium-sized Wadi al Takara, the communication routes across Jebel Abyad are: 1) Wadi el Jazal N, 2) Wadi el Arfa, 3) Wadi al Masek, 4) Wadi Shaaite, 5) Wadi Khsheibe N, 6) Wadi Khsheibe S, 7) Wadi el Kheurbet Khairem, 8) Wadi el Khalla, 9) Wadi el Mqeitaa. The association between these topographically determined communication lines (i.e. mountain passes) and burial monuments seems quite clear, as well as the clustering of these structures at certain nexuses and at Jazal. Where wadi names area not marked on the map, they are taken directly from their associated mountain range (e.g. Wadi el Mqeitaa).

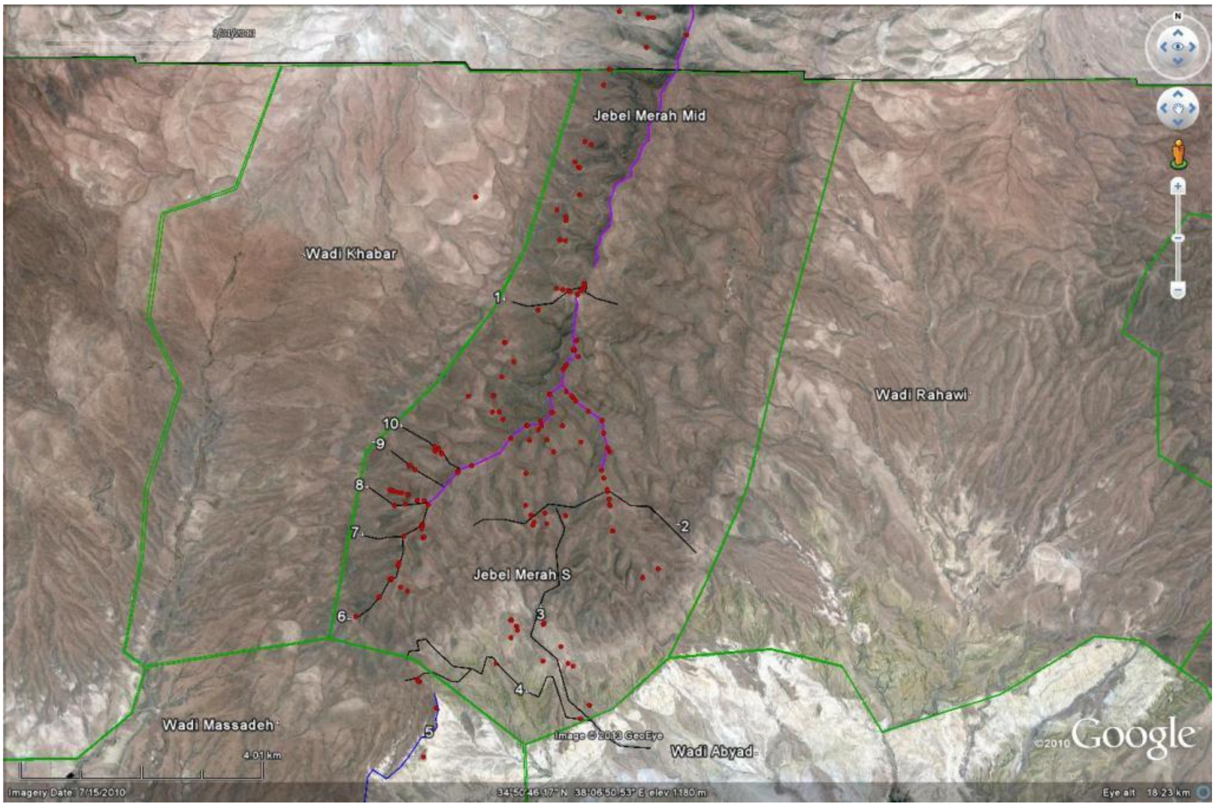



**Figure 4.8:** Satellite view of Jebel Merah and surrounding areas with tumuli surveyed during the 2011 campaign. The large wadi-valleys of Wadi Khabar and Wadi Rahawi on the west and east side of the mountain range respectively, have presumably constituted the main routes northward, while Jebel Merah itself is only possible to cross at Taniyet ez Zerr (route no. 1 – cf. **Figure 4.16**). The other designations on the map are: 2) West-east across southern foothills via the main interior valley (cf. Meyer 2011, pp. 54-61, site 215 and 222), 3) Route between interior valley and Wadi Abyad, 4) Main route between Wadi Abyad and Wadi Massadeh, 5) Watershed between the two areas in nos. 4, 6-10) Ridges connecting the plain with the southern foothills. The main ridgelines of Jebel Merah are marked as a purple line.

Thus, while individual tumuli may seem to lie isolated, these four cases are often associated with grouped burial monuments. Their landscape context suggests a focus on topographically determined communication routes, although the density of tumuli in the oasis of Jazal is particularly striking, and could indicate that this area had a special communicative, centripetal, or ritual status on a larger scale, e.g. being situated at the regional crossroads of both a north-south route toward the Euphrates and an east-west route toward the Homs plain. However, the fieldwork survey only could cover limited areas of a large and generally very rugged region, and the full picture could therefore provide a different perspective. This will be explored further below (cf. 4.3 and 4.5). The Jebel Merah region (**Figure 4.8**), although being of quite a different topographical character and geographical position, shows similar patterns of clustering. Here, tumuli are also focused on routes, but as there is only one route *across* the main ridge (cf. **Figure 4.16** and note 9), most of the clustering occur on the foothill saddles and low ridges, as well as marking the routes crossing the watershed and toward the main interior valley.

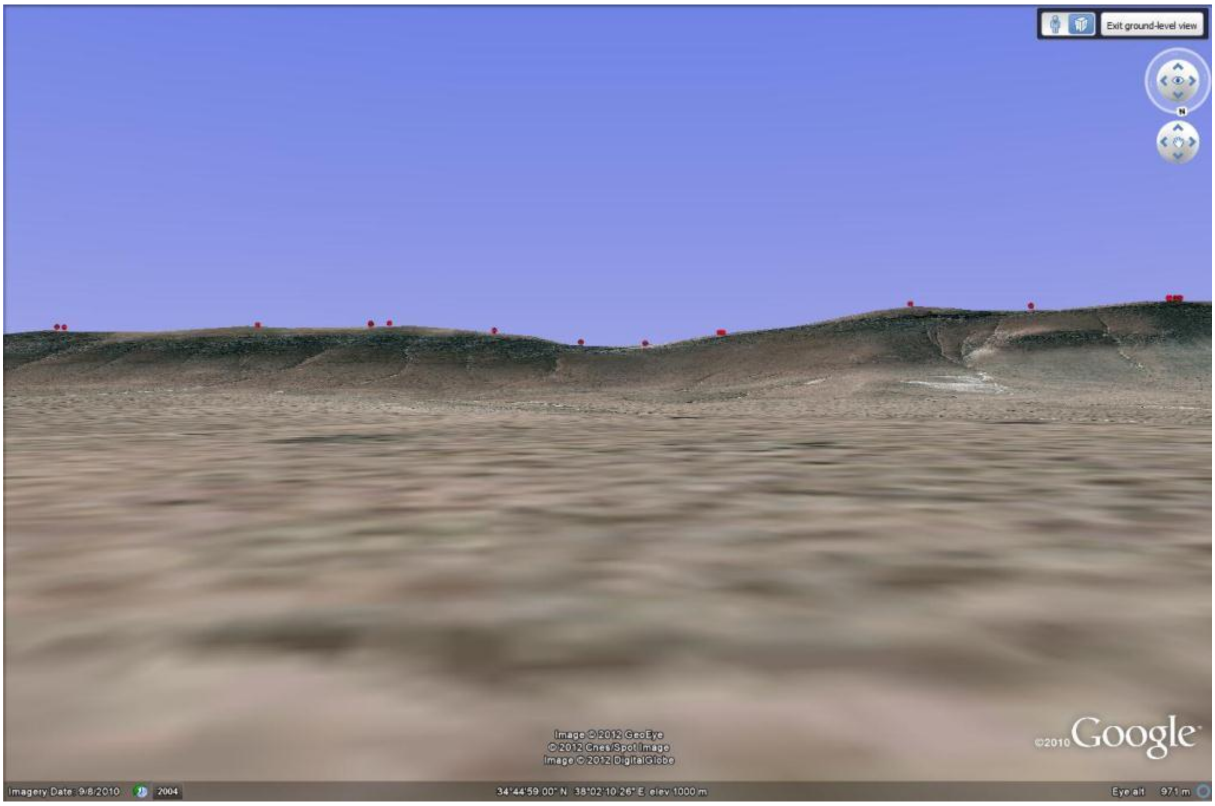



**Figure 4.9:** Computer-generated topographical view of the northern wall of Jebel Abyad as seen from Wadi Massadeh. While the red dots are obviously artificial, this image expresses the locations and communicative aspects of the tumuli quite well, and many of these are seen just as clearly on the ground from a long distance away. The saddle along this ridge seen in the centre of the image is in fact the entrance to a minor wadi crossing the range (cf. **Figure 4.27**, no. 16 – Wadi Mazrur).

#### *4.2.3.1 The Jebel Abyad region*

There are also indications of some typological variation with regard to topographical contexts in Jebel Abyad. Although the group designated as *cairns* includes too many variations to suggest any noticeable patterns, both the *mounds* and *turrets* seem to show tentative results. Apart from the oasis at Jazal, which contains numerous examples of all types of tumuli, turrets (including cairns/turrets) are mainly found along the mountain ridges of Jebel Abyad and *only* those ridges bordering onto other and topographically different segments of the regional landscape, e.g. large wadi-plains, as opposed to the interior of the mountain range (cf. **Figure 4.10** – right). In that context they also occur in rather low numbers, generally stand in isolation (although cf. 4.2.2), and are associated with topographically determined communication routes on a mid- to farview basis (cf. 4.1.4). At Jazal the picture is very different on all accounts, with several turrets standing in the central part of the plain, quite near the probable main route and relatively clustered. Mounds on the other hand show quite a different distribution pattern, as this type is *only* found along the banks and hillocks of wadis. Their topographical contexts vary from small-sized wadis slicing through a mountain range to important wadi-routes, like Wadi Takara, or even large regional wadi-plains, such as Wadi Dalil. They are mainly found in clusters, either with other mounds or sometimes also with cairns and monumentals, but due to their very unassuming character, they can only be spotted (in their current manifestation) when passing very close by them, which is probably also the reason why they are associated with topographically determined communication routes on a nearview basis (cf. 4.1.4). Indeed, none at all were found along the mountain ridges of Jebel Abyad or Jebel Homr ej Jazal, even though several other types of burial monuments were recorded there. The Jazal oasis features once again with several clusters of mounds, as does the crossroad between the three routes of Wadi Takara, Wadi al Masek, and Jazal (**Figure 4.10** – left).

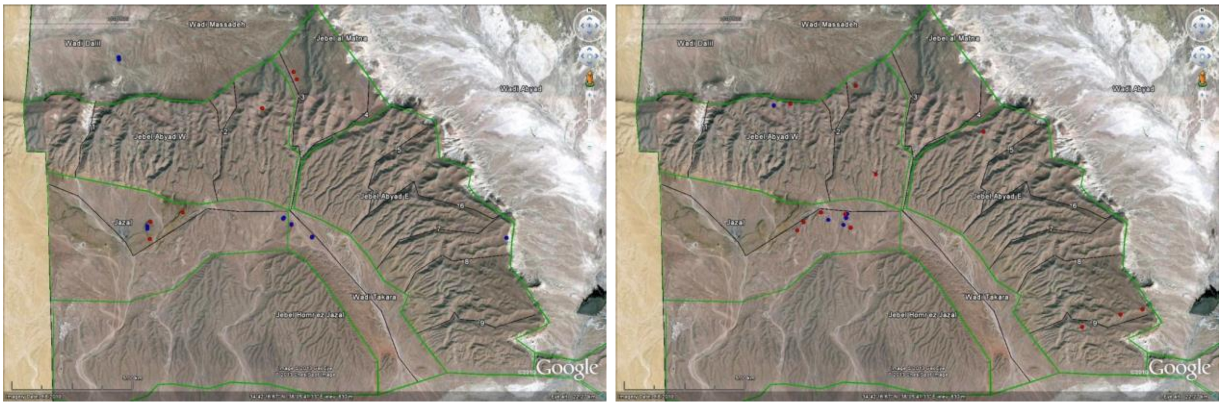



**Figure 4.10:** Distribution map of mounds (blue) and cairns/mounds (red) on the left side, and on the right side turrets (blue) and cairns/turrets (red) in the Jebel Abyad region. Both types are present and numerous in Jazal, which is densely packed with all types of tumuli. Apart from this, turrets are *only* present along the high ridges of Jebel Abyad, while mounds are *only* present along the banks and hillocks within Wadi Takara, Wadi al Masek, Wadi Dalil, in addition to one cairn/mound lying along the bank of a small, interior wadi of Jebel Abyad (Wadi Matna el Gharbiye – cf. **Figure 4.27**, no. 17).

The picture is not straightforward with regard to monumental tumuli in the Jebel Abyad region, of which several occur in Jazal and along the highest ridges of Jebel Abyad itself – and due to their large size are certainly visible from afar – but they are also quite numerous in northern Wadi Takara and in the crossroad with Wadi al Masek and Jazal (**Figure 4.11** – left). This may again suggest a high importance of Wadi Takara as a route toward the Palmyra oasis from Jazal and regions further away. If the auxiliary refurbishments, such as enclosing foot chains or platforms found to be part of certain tumulus groups, are plotted on a distribution map (**Figure 4.11** – right), the picture is rather similar to that of monumental cairns and seems to emphasise the same topographical features. However, to test whether the aspects regarding type-groups and topography is actually conforming to a contextual pattern, the analysis will continue to the other main area of fieldwork in the Palmyrene – the foothills and mountains range of Jebel Merah.

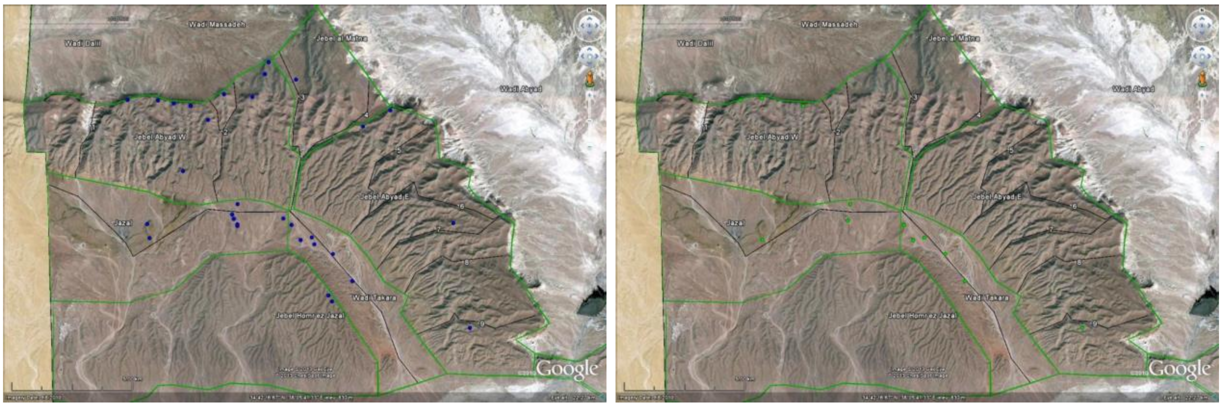


**Figure 4.11:** Distribution map of monumental cairns in blue (left) and complexes associated with auxiliary refurbishments in green (right) in the Jebel Abyad region. Both structural aspects seem to suggest a focus on the Jazal oasis, the Wadi Takara/Jazal/Wadi al Masek crossroad, and the imposing northern wall of Jebel Abyad directed toward the large wadi-plains of Wadi Dalil and Wadi Massadeh.

### *4.2.3.2 The Jebel Merah region*

The other region subjected to ground survey by the prehistoric team of the Palmyrena project is Jebel Merah, and more specifically its southern half. Although the picture at first glance can seem less clear with regard to the defined type-groups, patterns emerge when analysed on a local level (**Figure 4.12** and **Figure 4.13**). First of all, *mounds* continue to be associated with the lower-lying parts and wadis of the area, as well as carrying a particular *nearview* connection with communication lines, i.e. lying right next to key points along routes. Mounds in the foothills (**Figure 4.12** – left) are mainly located on local wadi banks or foothill saddles, where also today local travel is focused. However, some are also situated on the gently sloping ridges in the transitional zone linking the wadi-plains of Wadi Massadeh and Wadi Khabar with the higher-lying foothills. Only two mound clusters (appendix 1, nos. 296-298 and nos. 289-290) can indeed be said to lie in the upper reaches of the foothills, and even these actually lie in local mountain saddles. The example which illustrates most conspicuously the close association between mounds and communication routes is the cluster of mounds at Taniyet ez Zerr (**Figure 4.12**), a very distinct mountain pass along the main ridge of Jebel Merah (cf. **Figure 4.8**, no. 1, and also **Figure 4.16**). Here at least four mounds are located near the modern and presumably also ancient point for crossing the mountains, although as will be shown below the cemetery also includes cairns and turrets, suggesting an important topographical feature. However, this is not unexpected, as the next place along Jebel Merah where a crossing is at all practically possible lies *at least* 11 km further north, at the next mountain saddle[9]. Thus, the mountain range of Jebel Merah constitutes a major regional obstacle for travel between east and west, unless one aims for the crossing point at Taniyet ez Zerr.

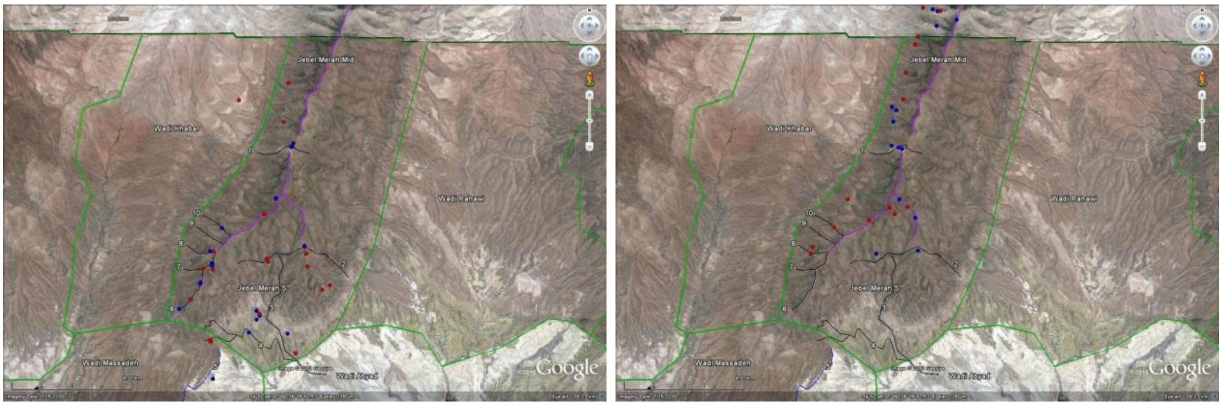


**Figure 4.12:** Distribution map of mounds (blue) and cairns/mounds (red) on the left side, and on the right side turrets (blue) and cairns/turrets (red) in the Jebel Merah region of the Palmyrene. The numbers on the figure are explained under **Figure 4.8**.

The distribution of the *turret* type-group in Jebel Merah (**Figure 4.12** – right) also show a pattern similar to the one in Jebel Abyad, although it needs to be studied at a local level and the placing of these structures seems adjusted to the variation in topographical profile of the mountain ranges. While the profile of Jebel Abyad is mainly one consisting of a high and steep northern wall oriented east-west with ridges stretching out southward in a sloping

[9] This next potential saddle route further north lies specifically at 34°57’08 N and 38°09’42 E, and is an unnamed feature in both the French and Russian maps available, thus possibly not even recognized as a crossing point, in which case the next point north of Taniyet ez Zerr (Taniyet = Arabic for *narrow pass*) where it would be practical to cross Jebel Merah is its northern foothills – thus the pass of Taniyet ez Zerr may be the *only* viable route across.

fashion toward the oasis of Jazal, the profile of Jebel Merah on the other hand is one of a very high (c. 1250-1340 m.a.s.l.) and long north-south oriented ridgeline with foothills in the northern and southern extremities and otherwise a series of lofty spur-ridges jutting out from the main range. Although these spurs are elevated relatively high above the wadi-plains on either side, they meet the main range 50-150 meters below the steep ridge, which thus also there acts like a barrier (cf. 4.2.3 and note 9).

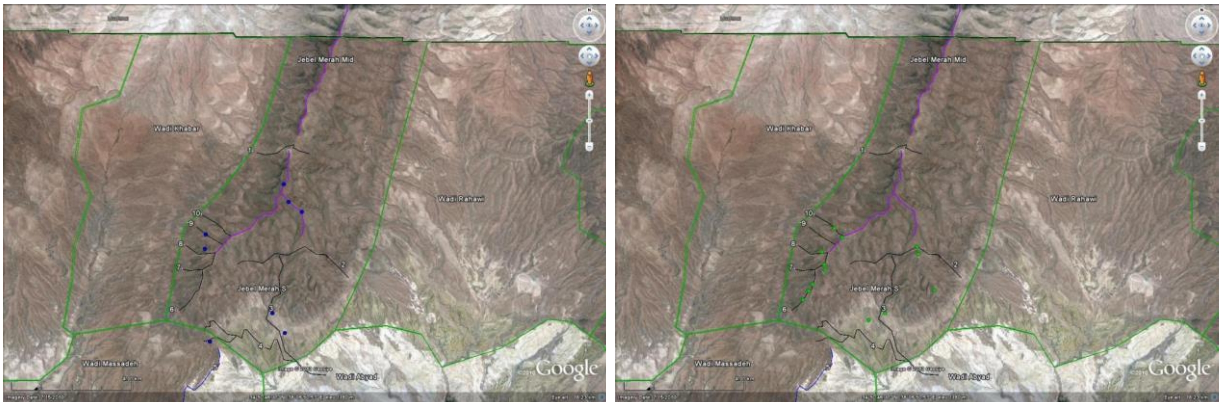



**Figure 4.13:** Map of monumental cairns in blue (left) and complexes associated with auxiliary refurbishments in lime green (right) in the Jebel Merah region. The numbers on the figure are explained under **Figure 4.8**.

Unfortunately, due to the shortened time in the field, only a small part of the highest ridge line was covered by the ground survey. North of Taniyet ez Zerr, only a single excursion by Michael Meyer (cf. Meyer 2011) documented a large turret on the main ridge, although it was clear from the ground that a number of large *monumental* tumuli are located along the lofty peaks of Jebel Merah. The effort needed to climb the ridge combined with menacing bad weather thwarted further documentation of these structures. The distribution here of monumental tumuli in Jebel Merah (**Figure 4.13** – left) probably suffers from this, and there are not as many of them documented in this area. A pattern of monumentals along the main ridge can be discerned on the map, which, like the northern wall of Jebel Abyad, seems to indicate a focus on *farview* with regard to communication lines. The foothills and lower-lying areas on the other hand contain few monumental burial structures, and are actually mostly devoid of these. Those that indeed are located there all focus on the regional routes, i.e. those going from Wadi Abyad into the Jebel Merah interior valley or up over the watershed (cf. **Figure 4.13**).

Complexes with external refurbishments in Jebel Merah seem to have a distribution pattern closer to that of mounds, with emphasis on routes into or up on the foothills and ultimately mountain range (cf. **Figure 4.13** – right). It is difficult to say from these two regions whether they themselves have an association with communication lines or if they instead have had a ritual function specifically with regard to the other burial structures and thus should be seen as part of each funerary complex itself. Arguing from the distribution in Jebel Abyad, they could have followed routes, but when the analysis from Jebel Merah is drawn in, the latter explanation seems far more reasonable, and the apparent distribution along the routes is merely a result of them being integrated into local clusters. Thus, the tumuli themselves were arguably directed toward communication lines, while the auxiliary refurbishments most likely served an internal function, possibly of ritual character, within the cemetery, as they are generally associated with clusters rather than isolated structures. However, the relation between tumuli *within* a complex was probably also based on some internal structural concept, such as lineage or real or supposed ancestry (cf. Fujii & Adachi 2010, p. 66).

Thus, the ground surveys of 2009 and 2011 have enabled the Palmyrena project to discern patterns in the distribution of burial monuments, but in order to investigate the true extent of such structures, as well as completing the amputated recording of Jebel Merah, it was necessary to change perspective and turn to other methods. For this purpose, the project purchased commercially available satellite images which subsequently have been subjected to scrupulous studies. I will now turn the attention to the methodical aspects and execution of this approach, as well as the results.

## 4.3 Satellite imagery studies of the Palmyrene

### 4.3.1 The rationale behind satellite studies

The political events unfolding in Syria ultimately prevented us from carrying out more than two seasons of archaeological survey in the Palmyrene dry steppe, and with the internal conflict intensifying into a civil war by the end 2011 and a two-year humanitarian catastrophe with no light on the horizon by 2014, there seems to be little chance of returning to Syria for at least several years. However, the just over 400 tumuli surveyed on the ground by the Palmyrena project do not populate the Palmyrene highlands in isolation, and to be able to obtain comparable material for the region, the project purchased commercially available satellite images of the remaining unsurveyed parts of Jebel Merah, as we had seen from afar that this mountain range is littered with burial monuments along its ridges, spurs, and foothills. In addition, images for Jebel Abyad were also acquired, enabling an evaluation of the actual extent of the ground survey. The use of satellite imagery was mainly initiated in Near Eastern archaeology during the first half of the 2000s (e.g. Ur 2003; Wilkinson et al. 2006) and has now become a growing trend and indeed an important tool in this particular part of the discipline (e.g. Menze et al 2007; Beck et al. 2007; Wilkinson et al 2010; Philip & Bradbury 2010; Bradbury 2011; Philip et al. 2011). As Thomas et al. (2008, p. 22) have put it, most archaeologists are able to conduct field work, rather than being restricted to surveying from their office – but this has indeed been the situation for the Palmyrena project ever since May of 2011. In fact, Bradbury (2011, pp. 164-165) emphasised that while large areas of central Syria seem devoid of burial monuments (cf. **Figure 4.22**), this is a picture which could quickly change due to archaeological exploration using satellite imagery and aerial photography from these areas. She suggested that the lack of such structures may be related to patterns of research, rather than the distribution of actual archeological features. Fortunately, the fieldwork carried out in advance by the Palmyrena project on the ground has enabled exactly this approach, namely a direct investigation of the visual manifestation certain archaeological structures have on the satellite imagery (**Figure 4.14**), and thus opened up the possibility of continuing the survey with focus on tumulus distribution expanded to a more extensive scale in the mountain ranges of Jebel Abyad and Jebel Merah. This enabled a link-up and unification of the tumuli recorded during the 2008 prospection with the northern limit for the 2011 survey. The comparison of satellite appearance of *known* burial structures with clear, but unsurveyed features visible on the satellite images makes it likely that the latter features also are in fact tumuli. In this manner it is possible to survey with quite high degree of certainty the areas of Jebel Abyad and Jebel Merah which due to time limitations and ruggedness of landscape were down-prioritised on the ground. However, while this approach has greatly augmented the picture and increased the data set, it cannot be characterised as totally exhaustive, as will be argued below (cf. 4.3.2.2).

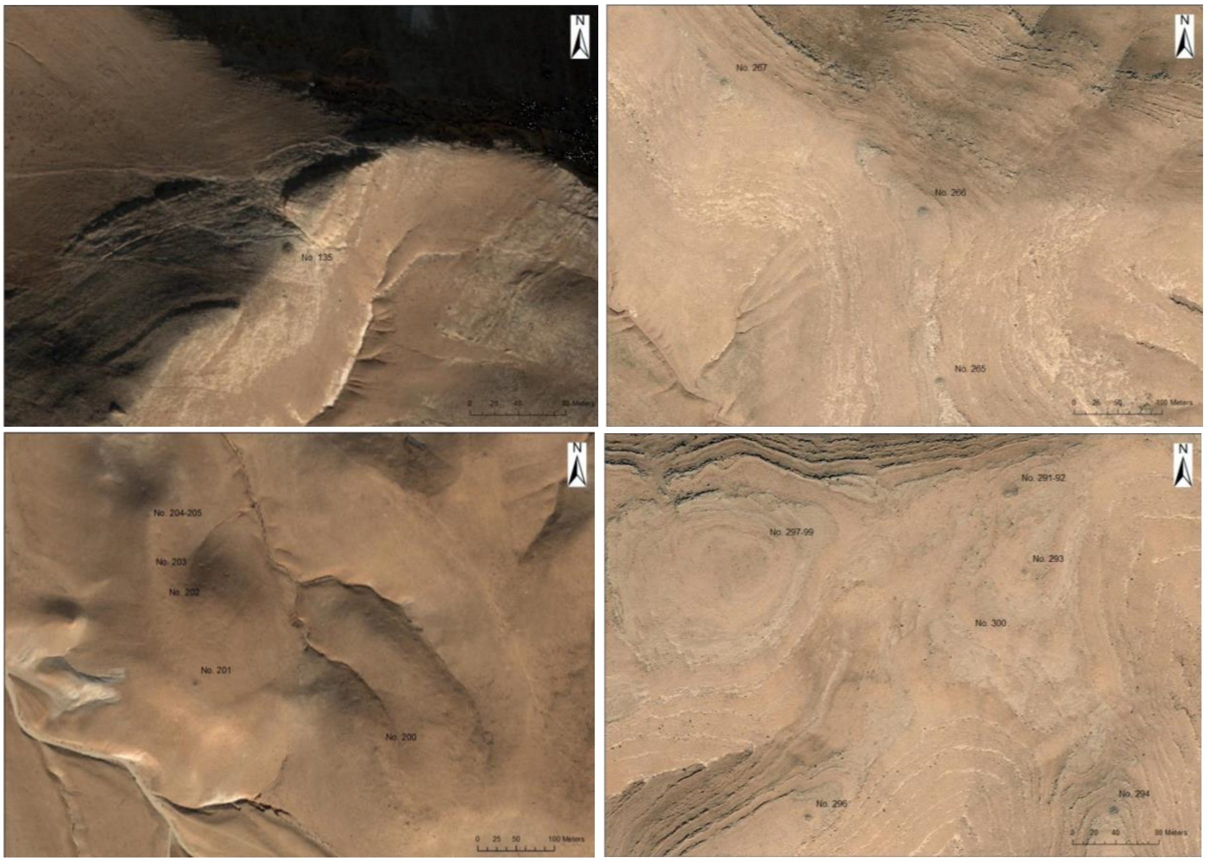



**Figure 4.14:** Four examples of archaeological structures on satellite imagery which also have been found and recorded on the ground. Clearly, some structures show up very well (top) and thus similar features can be plotted with reasonable certainty as burial monuments when spotted on a satellite image – particularly if they are located in the same environment as known examples of the same type (e.g. ridges, wadi entrances etc. – cf. 4.2.3). Others are less clear (bottom, each marked by number on their *top right* side), and will probably even get overlooked as archaeological structures when their surroundings are surveyed in ArcGIS. In these instances, topography and proximity to less ambiguous archaeological structures could help, although if they are plotted, they must obviously be viewed and characterised as less certain structure types.

### 4.3.2 The results of satellite imagery studies

#### *4.3.2.1 Aspects of methodical execution*

The method for investigating of satellite images was carried out by georeferencing the purchased map-files as rasters in the program ArcGIS, and systematically (i.e. by transecting the areas in manageable rectangular sections) recording all Palmyrene features which showed a potential burial monument. Because the certainty of these features being archaeological structures obviously constituted a sliding scale, I divided them into two categories of plots – *unregistered* and *possible* tumuli. The unregistered ones were defined as features which have a high probability of being tumuli, mainly based on visual manifestation in the imagery, but also including considerations of topographical and archaeological context. However, it is of course impossible to be absolutely certain about the character and true nature of any archaeological structures recorded via remote sensing without subsequently investigating these features on the ground (called *ground truthing,* cf. Thomas et al. 2008, p. 27). With regard to their investigation of satellite imagery as an emerging resource in Near Eastern archaeological research, Wilkinson et al. (2006, p. 749) concluded quite succinctly:

*"(…) satellite imagery can inform ground survey but cannot replace it".*

Erring on the side of caution, I have estimated that the probability of the *unregistered* monuments actually being archaeological structures of a funerary type is from 90 to 99 % – i.e. at least nine out of ten of the unregistered ones plotted using this method *are* in fact tumuli. The chance is probably in reality higher, as I have consciously included only the most convincing features in this category. The second type of features, albeit more uncertain and therefore termed possible tumuli, still incorporates a probability range which I estimate to lie between 70 and 90 % – once more erring on the side of caution – which thus also suggests a high degree of certainty for them being burial monuments. In other words, in the worst case scenario, 30 % of these possible monuments can be explained as geology, modern remains, or other features (cf. **Figure 4.19** and **Figure 4.20**). This plot has on the other hand been much more dependent on the situational, topographical, and archaeological context for each structure, even though all possible features were *individually* considered. For instance, if a spot on the map looked like a tumulus, the local surroundings were analysed to raise or lower its chance of actually being one. Such an approach and the arguments behind it may initially seem somewhat haphazard and circular, but the method has been focused and cautious throughout its execution, and I would advocate its merit. **Figure 4.15** shows a typical satellite view of a foothill ridge and adjacent wadi valleys in Jebel Merah, where both unregistered and possible tumuli can be seen, each marked by the category to which it has been evaluated to belong. Some of the unregistered ones more or less clearly feature foot chains, certainly securing them into their assigned classification. Although not as common, the satellite studies also enabled an extensive survey of kites and stone enclosures in the regions covered by the purchased imagery (cf. **Figure 4.17**). These were merely plotted or not, with no distinction in probability, as they in general leave much less ambiguous imprints on the images.

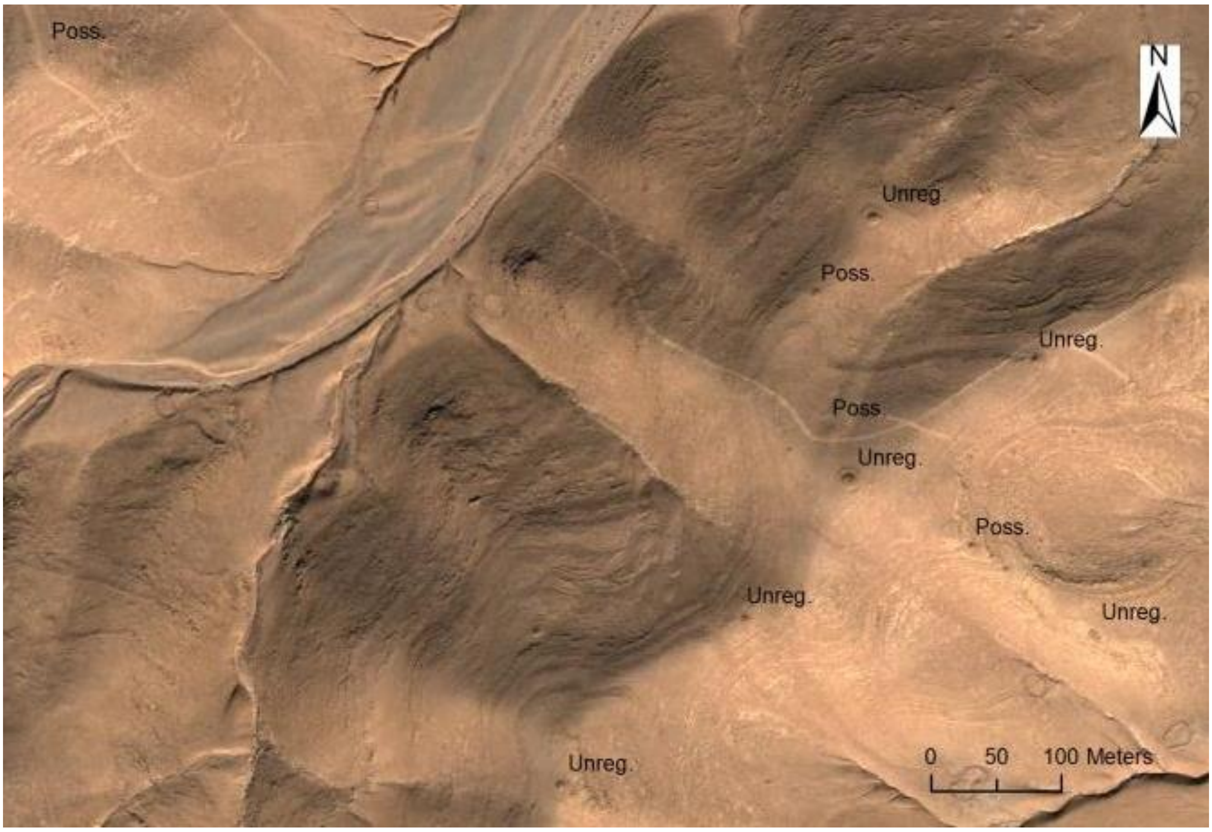



**Figure 4.15:** Detail of satellite image from northeastern Jebel Merah, with unregistered and possible tumuli marked. It is clear that some, if not all, of the possible structures probably *are* tumuli, but the cautious approach being applied (cf. 4.3.2.1) necessitates a degree of prudence. The unregistered structures are quite clearly burial monuments, with two of them including visible foot chains. Many structures have also been positively identified recorded using this method by virtue of them having experienced plundering, and thus exhibiting a definitive, central looting pit. The designations (unregistered/possible) are all positioned on the top right side of each feature.

### *4.3.2.2 Tumuli and their contextual aspects*

The results of the satellite imagery investigation convey a picture beyond the limits of the ground survey, which falls into line with the patterns detected in the analyses of documented Palmyrene tumuli in general. In the interior of Jebel Abyad and on most of the ridges of Jebel Merah, lie features which cannot be mistaken with any other archaeological structures than tumuli scattered with striking regularity (cf. appendix 2). The larger ones are generally located on crossroads or distal ends of foothills and mountain ridges, or on high peaks, while smaller ones often lie in their orbit, seemingly in reference to the presumably monumental tumuli – either along the same ridge some distance away or in close proximity as satellites to a larger central burial monument, or conceivably both (**Figure 4.15**). Large tumuli can even feature refurbishments manifested in visible foot chains encircling them. Another recurring aspect also found to be the case in the ground survey is a conceptual focus on entrances to certain minor wadis and the ridges hemming in their corresponding passes, which due to their topographical location suggests routinised communication lines (e.g. Taniyet ez Zerr, **Figure 4.16** – also cf. 4.2.3.2). However, the large regional wadi-plains, such as Wadi Khabar or Wadi Rahawi (cf. **Figure 4.18**, nos. 2 and 18), have possibly also been landmarked in a similar manner, although on an elevated level, as dense concentrations of burial monuments are found located on either of the distal foothills of Jebel Merah (cf. appendix 2, pp. III-IV). This aspect was discerned in the analyses above (4.2.3) and is confirmed here by the satellite imagery studies. This approach more or less confirms the general pattern of tumulus distribution suggested by the ground survey, and nearly doubled the data set from 404 tumuli to 771 burial monuments of near certainty. This is in fact fewer than the potential number, because the areas surveyed via satellite imagery include Jebel Abyad (including Al Matna and Wadi Takara) and all of Jebel Merah (cf. appendix 2, pp. III and V), but on the other hand exclude the extensive plains of Wadi Khabar, Wadi Massadeh and Wadi Dalil, and more importantly the oasis of Jazal (cf. **Figure 4.18**, nos. 2, 4 and 8). While the first three of these latter areas probably are much less densely packed with tumuli than the mountain ranges, based on the experience on the ground, the same observations also strongly suggest dense concentrations in Jazal. When isolating the numbers for Jebel Abyad and Jebel Merah exclusively, in fact 343 were surveyed on the ground[10] vs. 367 recorded and placed in the unregistered category, thus *more* than doubling the data set. In addition, 586 examples of possible tumuli were plotted in the same areas, bringing the potential total to over 1350 burial monuments – even excluding presumably densely packed zones like Jazal. For instance, the number of tumuli within the Jebel Abyad W region (cf. **Figure 4.18**, no. 5) rise from 70 examples prior to the satellite investigation to 136 when including the unregistered category, and 271 examples if including the possible tumuli when incorporating the satellite results (appendix 2, pp. III-VI). This shows just how many more tumuli can be found when subjecting commercially available satellite imagery to studies, and confirms that Bradbury (2011) was right in advocating this approach for central Syria (cf. 4.3.1). Another factor which would probably raise the number of tumuli even higher if satellite studies of this region would be possible to combine with ground surveys, is the fact that some burial monuments are just too ephemeral to spot on the imagery, particularly well shown by the two lower

[10] In this case, as opposed to the total of 404 tumuli for all surveyed areas.

pictures in **Figure 4.14**. The tumuli marked there as nos. 297-300 would most likely not have been plotted as neither unregistered nor possible burial monuments when the transection scan passed over their area. Only nos. 291-294 and no. 296 in that particular image are clear enough to merit plotting in ArcGIS, thus in effect losing four out of nine tumuli on that ridge. This shows that one should not presume, as pointed out, that satellite-based remote surveying is an exhaustive exercise, as well as emphasizing the importance of ground truthing. However, it also means that even though some of the plotted possible tumuli may in fact be associated with other anthropogenic or natural explanations, the actual *number* of tumuli in an area can potentially be close to the correct amount.

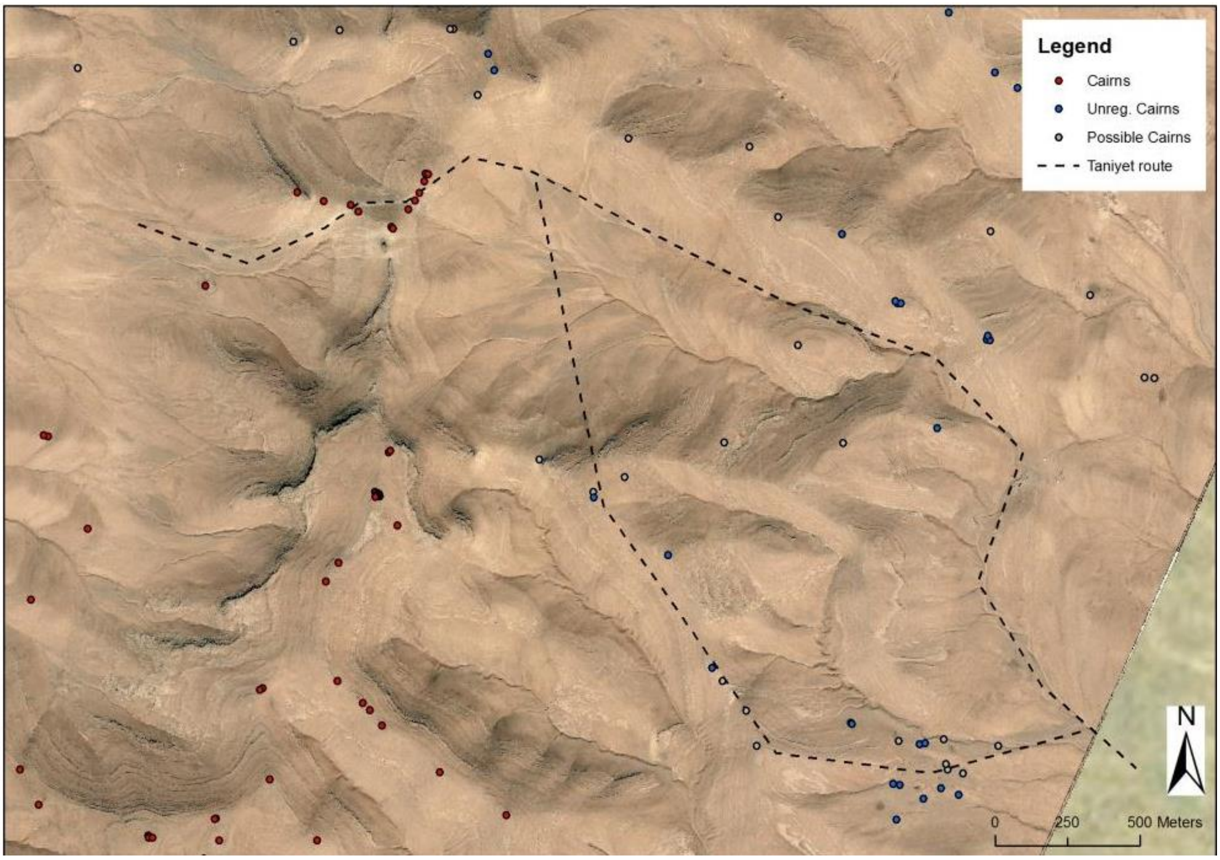



**Figure 4.16:** Map of the mountain pass Taniyet ez Zerr showing both unregistered and possible tumuli from the study of satellite imagery, as well as the local distribution of ground-surveyed ones. Following the natural communication line of an interior valley and subsequent minor wadi-valleys into the large Wadi Rahawi, the route is lined with burial monuments. However, the smaller wadi goes through a section of the area with very steep sides, possibly making the southern route along the rolling foothill ridge a more practical option, something which also is suggested by the large group of probable tumuli which are located along and particularly on the distal end of this foothill ridge. On the other hand, both of these potential routes more or less meet at this point, where they continue into the large Wadi Rahawi. Thus, both ends of the presumable only route across the Jebel Merah main ridge (cf. 4.2.3.2) incorporate extensive tumulus cemeteries.

#### *4.3.2.3 Kites and stone enclosures*

The main aim for the studies of satellite imagery of the Jebel Abyad and Jebel Merah regions was to complete the distribution picture of Palmyrene burial monuments to the furthest possible extent by augmenting it with the areas which for one reason or another had not been covered by the ground survey. However, the imagery also made it possible to record the two other frequently recurring structures in the Palmyrene dry steppe – stone enclosures and kites (cf. 4.5.4 and 4.5.5) – which the method of satellite surveying is particularly well suited to find (**Figure 4.17**). Although the ground survey only documented one kite in detail lying in the southern Jebel Merah foothills, and spotted another in the northern foothills, an additional six examples have been found in the satellite imagery in the latter area and one kite has been recorded in isolation in Wadi Takara. However, both tantalizingly and somewhat disturbingly, the ground-surveyed kite in the southern Jebel Merah foothills would probably have been overlooked in a regular transection scan, because the walls of both the antennae and the trap itself are very diffuse and hard to see in the satellite images, either due to low construction height, low preservation status, or lighting – or a combination of all these factors. This emphasises again the point made earlier (cf. 4.3.1), that the exhaustiveness of this method is relative, and that other structures of this type *can* have been overlooked, although I doubt more than one or two, if any. Stone enclosures have a high degree of visibility in the Palmyrene satellite images, and hundreds have been recorded in and around the two main mountain ranges in the surveyed concession area. Additionally, the method makes it possible to ascertain patterns in the topographical context of these structures. Generally, stone enclosures in this region, both single and interlocking, are actually located on slightly or severely sloping ground linking the foothill ridges with the wadi bottoms, suggesting that a focus on function in at least the steeper cases was not necessarily animal pens, but rather something different. The pattern also overwhelmingly suggests an association with small- to medium-sized wadis (cf. **Figure 4.17** and the corresponding close-up in **Figure 4.15**), where for instance water catchment from the hills and ridges around them probably would have been higher than in the larger wadis with their gently undulating and flat topography where the run-off is already collected and relatively slowly flowing in intermittent streams. Thus, arguably many stone enclosures in the Palmyrene seem to have been potentially constructed for collection and build-up of soil and moisture. Meyer (2008, p. 129) argued that some of them can have served as small gardens for vegetables or some other form of limited horticulture. He also emphasised that although this seems likely to be the case for some examples, others can have served different functions, e.g. as pens. I will return to the issue of function and distribution of both these types of the Bronze Age mobile pastoralist technocomplex in more detail later (cf. 4.5.4).

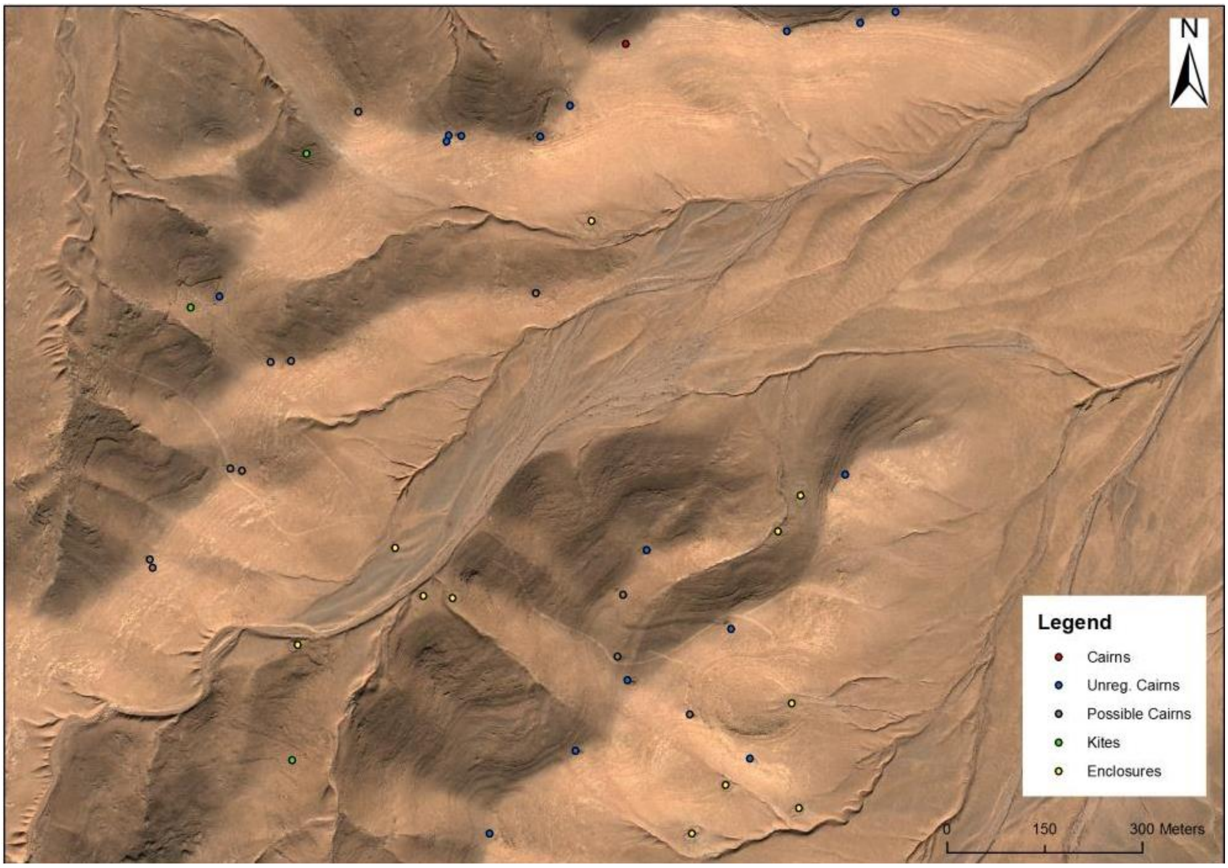



**Figure 4.17:** Satellite image from northeastern Jebel Merah (cf. **Figure 4.15** for a close-up of lower centre part) showing various examples of the pastoral nomadic technocomplex, here as interpreted structures. Most of the stone enclosures shown are of a simple type, but their general association with the slopes between ridges and wadi bottoms is quite clear. The image has also captured two types of kites in the top left corner (type 4A and 2A in Echallier & Braemer 1995, p. 45), and one eroded example near bottom left where only the antennae are visible. Midway along the top edge is one of the 2008 tumuli plotted (red), while the remaining dots signify unregistered (blue) and possible (grey) burial monuments (cf. 4.3.2.1).

## 4.4 Google Earth satellite imagery studies of the Palmyrene

As mentioned at the start of this chapter (cf. 4.1.1), Zarins (1992, p. 50) defined three types of archaeological structures which arguably constitute the pastoral nomadic technocomplex of the Chalcolithic and Early Bronze Age Near East. All these structure types have been recorded in detail or otherwise noted by the Palmyrena project, either through ground survey in the regions of Jebel Abyad and Jebel Merah, albeit some in larger amounts than others, or via subsequent satellite studies using commercially available imagery, which augmented these numbers significantly (4.3.2.2 and 4.3.2.3). However, during the last couple of years another method for recording sites in the arid and/or remote regions of the world has emerged and gained importance for archaeologists – survey via Google Earth (e.g. Thomas et al. 2008; Pärssinen et al. 2009; Kennedy & Bishop 2011; Kennedy 2012). The approach was argued by Ur (2006) to be highly promising for archaeological research, but cannot be said to have reached its full potential until the second decade of this millennium, and even then only in association with certain areas of the globe due to variation in coverage. Luckily, the potential for this approach has been very good in Syria and particularly so for the highlands and dry steppe north and east of Palmyra, i.e. the heart of the Palmyrene, where large areas of high-resolution satellite imagery have been made available since 2010. The Google Earth survey has greatly added to the material already presented within the technocomplex in the region. The study of tumuli, kites, and stone enclosures has been carried out on an area of 3800 $km^2$ in the Palmyrene regions bordering onto the concession area, as well as parts of the latter area where the project lacked purchased satellite images, and has in the process increased the number of probable burial monuments twentyfold to nearly 8500 examples (cf. 4.5.3), the number of kites by a hundredfold, in all 426 examples (cf. 4.5.5), as well as recording a vast distribution of over 2200 stone enclosures[11] (cf. 4.5.4). The investigation has been exhaustive in that it incorporates continuous coverage for the whole area and includes all parts of the landscape. It can therefore be seen as representatively indicative for associations between archaeological structures and topographical contexts in the Palmyrene. Finally, it must be pointed out that a small part in the northwestern Palmyrene has not been fully investigated due to lack of time. Two lesser mountain ranges (cf. **Figure 4.18**, areas a/b) have only been plotted with tumuli, while the wadi-plains surrounding these have been left out altogether with regard to systematic transection. However, preliminary investigations convey a pattern following the lines particular to such landscapes, i.e. structures of all types relatively few and far between. For the northern part of Jebel Merah, an area also left out of the Google Earth survey, cf. mainly appendix 2, pp. III-IV.

[11] These are the total numbers of archaeological structures recorded at the end of 2012 for all methods combined.

### 4.4.1 Outline of methodic execution

The approach chosen for this study was methodically dividing the Palmyrene into 61 separate areas between Palmyra and Suhne, as well as including the steppe further north- and northeastward toward Jebel Bishri, each representing more or less distinct topographical parts of the landscape – mostly by crystallisation into mountain ranges and large wadi valleys or plains, but where this was not practical, both highlands and lowlands were incorporated into one separate part (e.g. **Figure 4.18**, areas 26 and 35). The reason behind this division was that both the ground survey and satellite imagery suggested a high degree of topographical determinative in the distribution of tumuli and indeed for the distribution of the whole horizon of the technocomplex. The actual survey method was similar to the one used for the commercial satellite imagery (cf. 4.3.2.1), although the software applied (Google Earth) does not contain the same range of analytical tools and possibilities as ArcGIS, which resulted in a simpler execution. Instead of using the window bars to keep systematic track of scanned areas, a temporary manual partitioning of the areas was used to create a grid system for systematic surveying to minimise subjective browsing (cf. Kennedy & Bishop 2011, p. 1292). Additionally, the Google Earth images are of a slightly poorer quality than the commercial images, meaning that less certainty could be placed in the features detected. Thus, based on the same arguments as those for the satellite survey, the entire Google Earth data set concerning tumuli are estimated to have a 70-99 % probability of actually being archaeological burial monuments, with no internal division of this group being defined. The other two structures recorded during this process were kites and stone enclosures. The kites are nearly all of certain status as being that particular type of archaeological construction, apart from cases where the trap itself was eroded away or destroyed by development, and only the antennae revealed where it once had been. The same was the case for the vast number and variety of stone enclosures recorded all over the Palmyrene. All these finds have been collected in appendix 4, pp. I-XVII and shown in **Figure 4.23**, which are linked to and must be viewed in association with **Figure 4.18**.

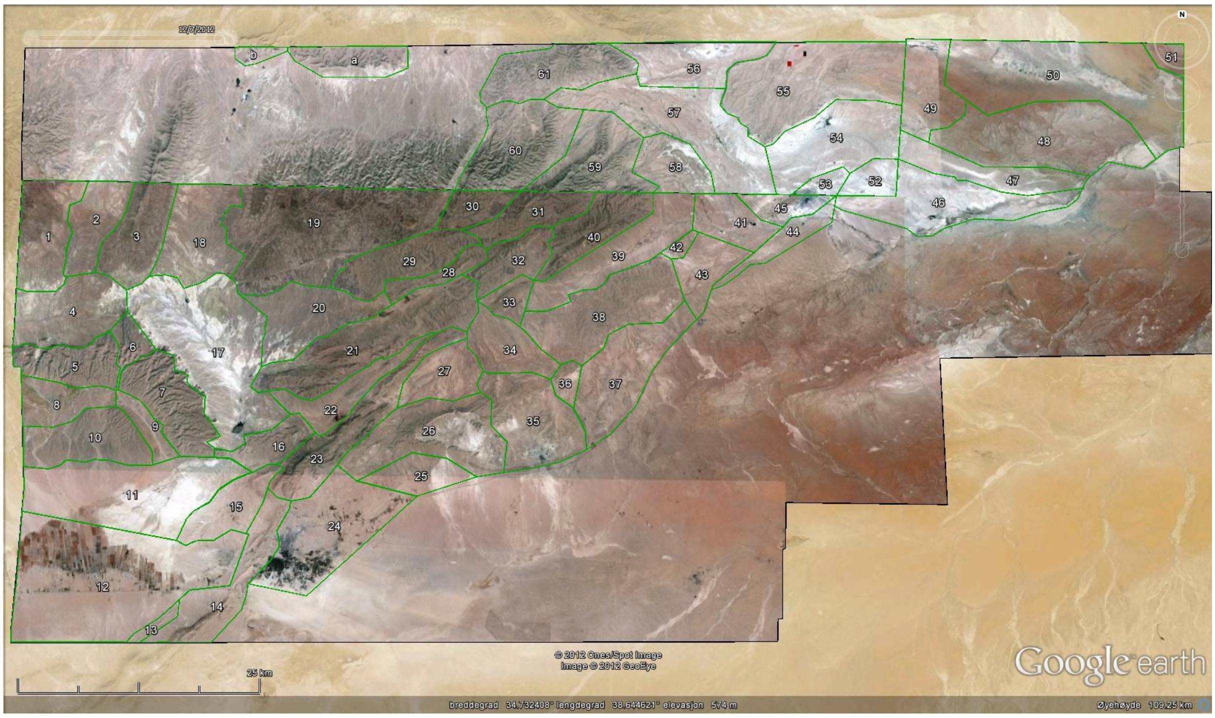



**Figure 4.18:** Map of the Palmyrene divided into 61 separate topographical areas (cf. appendix 3 and 4 for area designations), as well as showing two discontinuous northern areas subjected to preliminary investigation. The outlined area is one of high-resolution satellite imagery, while the images of the surrounding areas has too low resolution for surveying. Additional areas of preliminary surveying are: a) Jebel Asabi, b) Jebel Yatime.

### 4.4.2 Considerations on general issues and problems

The Google Earth investigation carries some considerations which are not as relevant in the satellite imagery study, mainly due to the higher resolution of the latter. Identification of tumuli, in addition to their topographical contexts, was made on the basis of the appearance of certain dark spots widely distributed in the landscape. However, there is a range of anthropogenic and natural processes which can leave such marks on the ground. While the acceptance or rejection of features can be straightforward in many cases, certain particular processes can produce dark spots very similar to known tumuli and therefore easily be mistaken to be archaeological structures. One very common feature which to the untrained eye can look like a pile of rocks are the dark-grey/black spots usually occurring in association with sites of recent Bedouin activity, particularly camps, remains of which (e.g. fires, scattered ashes and other waste forms) also were found by Kennedy and Bishop (2011, p. 1285) to be complicating their prospections in Saudi-Arabia. The satellite survey of the Palmyrene presented in 4.3 sometimes also encountered this issue, but by individual consideration of each potential site, most misinterpretations have probably been avoided. The main giveaway for a feature originating from modern Bedouin activities rather than being an archaeological monument is proximity to their camps. These are easily spotted because they leave several rectangular spots, either brighter than the ground or dark grey to black in colour, where their tents have been pitched, with other marks around these of various shapes and sizes regularly found, but again mainly exposed as modern by their colour, which is similar to identical to the dark versions of the tent shadows nearby (cf. **Figure 4.19** for some of these traces). Camp sites are also often littered with tracks from motorised vehicles – admittedly a ubiquitous aspect in the steppe apart from on and along the steeper and loftier slopes and ridges – but occurring in much higher frequency around Bedouin camps. Generally, it takes the whole mix of these features to firmly establish that ambiguous marks are made by modern human refuse, and on that basis rejecting a site as being of ancient origin.

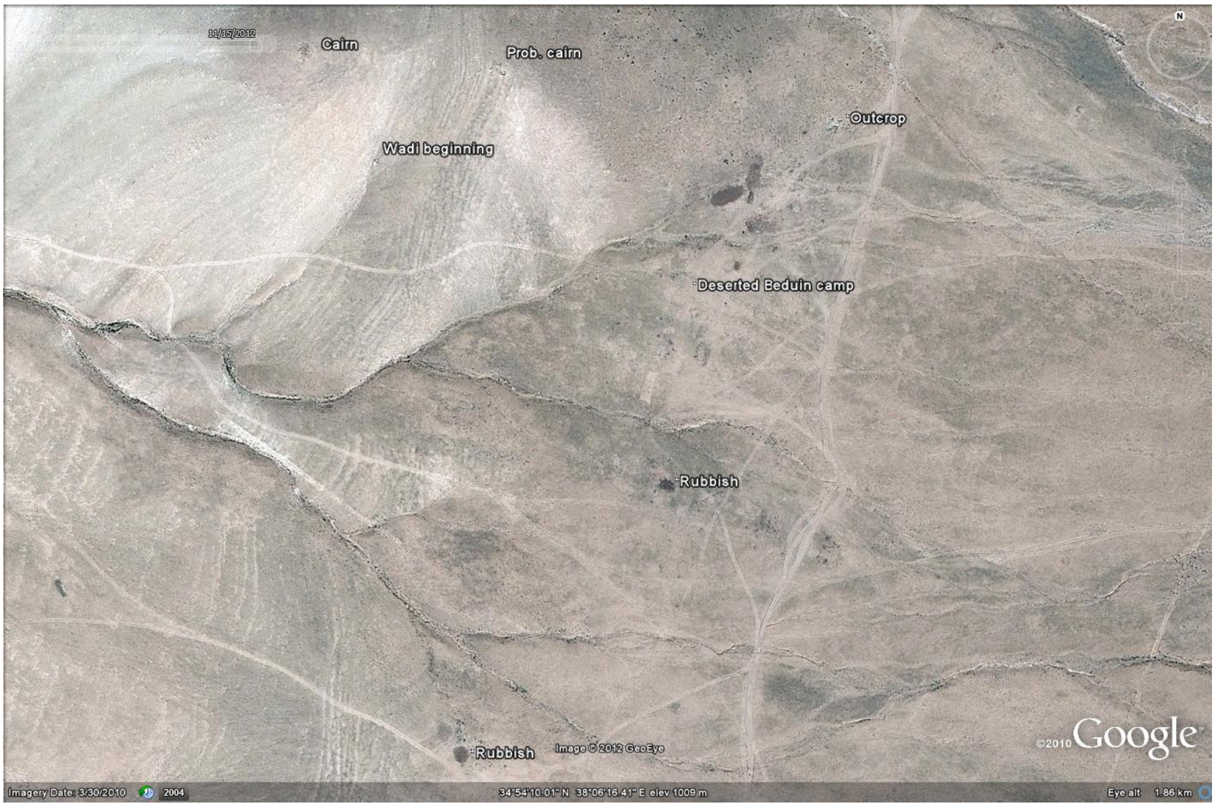



**Figure 4.19:** Close-up image of a part of Wadi Khabar (cf. **Figure 4.18**, no. 2) in which manifestations of Bedouin activities are shown (cf. **Figure 4.20** for further explanation).


**Figure 4.20:** Close-up image of an area in Jebel Hawit er Rass N ( cf. **Figure 4.18**, no. 60). **Figure 4.19** and **Figure 4.20** show various features which could be mistaken for tumuli, but really are results of other processes or activities. However, tumuli are in fact also present in these images, as well as probable tumuli. **Figure 4.19** shows remains of modern Bedouin activities, as well as exhibiting certain natural features of ambiguity, while **Figure 4.20** shows specifically traces of natural processes leaving such features, e.g. geology and vegetation.

There are also several features of the natural kind which in appearance can look like tumuli (cf. **Figure 4.20**). Geological processes can result in piles of rocks, which may seem like they have been constructed by humans. In these instances, context and form are the main aspects to consider, but sometimes even context can be misleading. For instance, craggy, rocky outcrops are common along the ridges and peaks in the Palmyrene mountain ranges, following similar patterns as tumuli have been shown to do. Additionally, such outcrops can also obscure real tumuli by creating shadows covering key parts of the local terrain. When commercial satellite images are available for the relevant area, these may solve the issue by providing an alternative with variability in lighting between these and the Google Earth images. However, the inbuilt software simulation providing lighting conditions for various times of the day cannot help in this matter. Another natural feature which often creates problems for satellite surveying is the presence of vegetation (Kennedy & Bishop 2011, p. 1285). Obviously, continuous cover of trees would present a major obstacle, but the arid and semi-arid regions of the Near East are so barren in this respect that the potential for this method is high (Hoshino et al. 2010, p. 17), while e.g. LIDAR scanning is necessary for similar surveys in the forested areas of northern Europe. However, even a slight vegetation cover, like that found in the Jebel Abu Rujmein massive (cf. **Figure 4.21**) and some parts of Jebel Labidah, may lead to doubt and second-guessing. Shade from trees can conceal a tumulus lying next to it in the same way geology can, but also the generally darker soil of areas with more vegetation and the green hue from the slightly lusher and less degraded parts of the steppe (cf. 2.3) makes the contrast between the ground and potential rock piles much vaguer. Thus, the destruction of the fragile steppe parkland has for archaeological method been a very slight blessing in a disguise of ecological malaise. The last main natural process which can confuse a satellite survey using Google Earth relates to the small to tiny wadis which dot the Palmyrene in their thousands. While there are no features which can be mistaken for burial structures in the wadi bottoms themselves, two particular ones at the head of such intermittent streams can occasionally look like tumuli – dark spots of vegetation which often grow in this slightly moister local environment and small screes which are most likely associated with either the steepness of the slope or with a tiny spring connected to the aquifer. The true nature of both these features usually reveal itself by the clear imprint of the continuation of the wadi, but in areas of very steep slopes plunging down from a ridge, the only way to see that the mark is not a tumulus along a ridge is to actually apply the inbuilt 3D tool in Google Earth and move down into ground view. Wadis should there start on sloping ground aligning with the direction of the course, while burial monuments generally lie right on the ridge, which plunges down on one or both sides. Finally, there is the possibility that some local areas can be obscured by light cloud cover, but this has not been an issue in the 3800 $km^2$ covered by the 61 areas subjected to investigations in the Palmyrene. It was only encountered in the preliminary survey of the northwestern part (cf. **Figure 4.18**, areas a/b), and there only slightly limiting and extremely localised. The weather in fact yet another advantage of surveying in arid regions, in addition to the general landscape and lack of vegetation (although cf. **Figure 4.21**).


**Figure 4.21:** Image of area in Jebel Hawit er Rass where terebinth trees are protected and survive to a certain extent. Two aspects are clear from this picture: First, the general presence of these trees has also provided vastly better environment for lower types of vegetation as well as the regional microclimate, shown by the green slopes and ridges (cf. 2.3). Second, this environment makes the survey of archaeological structures much more complicated, veiling any structures in the shadow of trees or just by reducing the contrast between the ground and overlying features. Additionally, because collections of rocks gather more soil, shrubs and small trees are more likely to grow there, potentially masking any tumulus-like structures below.

However, there are also certain aspects which can *heighten* the possibility of a feature on the Google Earth images of the Palmyrene in fact being a burial monument, in addition to associations with distinctive topographical circumstances (i.e. those described under 4.1.4, pt. a-d) and archaeological context. Visible foot chains was a feature mentioned under 4.3.2.2 to more or less raise the chance to near-certainty, a concept also applicable for the Google Earth approach, although the majority of tumuli surveyed actually lack this refurbishment. In addition, one or more looting pits and disturbances can frequently be discerned in the middle of a burial monument, which heightens the probability of correct categorisation, but pits can also be the result of well-digging or modern sondages for mineral or petroleum prospection. However, the wells (*bir/biar*) are usually located in very close association with wadis and natural springs, while modern geological prospection nearly always manifests itself by occurring as perfectly linear or very regular patterns, regardless of the inherent difficulty of traversing the terrain. The omnipresent tracks created by motorised vehicles, while destructive and disruptive in the landscape, usually also try to avoid large obstacles such as cairns, turrets, and monumentals, and can in such cases appear on the image taking a swerving course around a darker spot, indicating an impediment of some height or ruggedness, which if not geology, often can be explained as a tumulus. However, mounds are probably too low to be detected in this manner. Of course, several or all of the above could and should be applied to figure out whether a potential tumulus is an archaeological feature or a result of natural or modern processes.

## 4.5 Results from the Google Earth studies

### 4.5.1 General results from the survey of the Palmyrene

Now that the execution of the Google Earth survey has been explained in detail, and most of the conceivable obstacles and issues which can and in effect also *were* encountered regularly have been presented and considered, I will now continue with the results from this research. The distribution of the three structures types under investigation – tumuli, stone enclosures, and kites – will be presented below with analyses of apparent patterns on a local and regional scale, as well as spatial, functional, and chronological implications deduced from this work. The map (**Figure 4.22**), taken from Bradbury (2011) and modified with demarcation of the area of high-resolution images of which the top half was surveyed, shows the importance of a study of burial monuments in this region, an issue she herself also emphasised. However, initially it is fitting to mention some general aspects of the Palmyrene in particular and its archaeological structures when the region is perceived from space. In the rest of this subchapter all toponyms referring to a part of the landscape area divisions shown in **Figure 4.18** and **Figure 4.29** are followed by a number in parenthesis, which indicates their location on these maps.

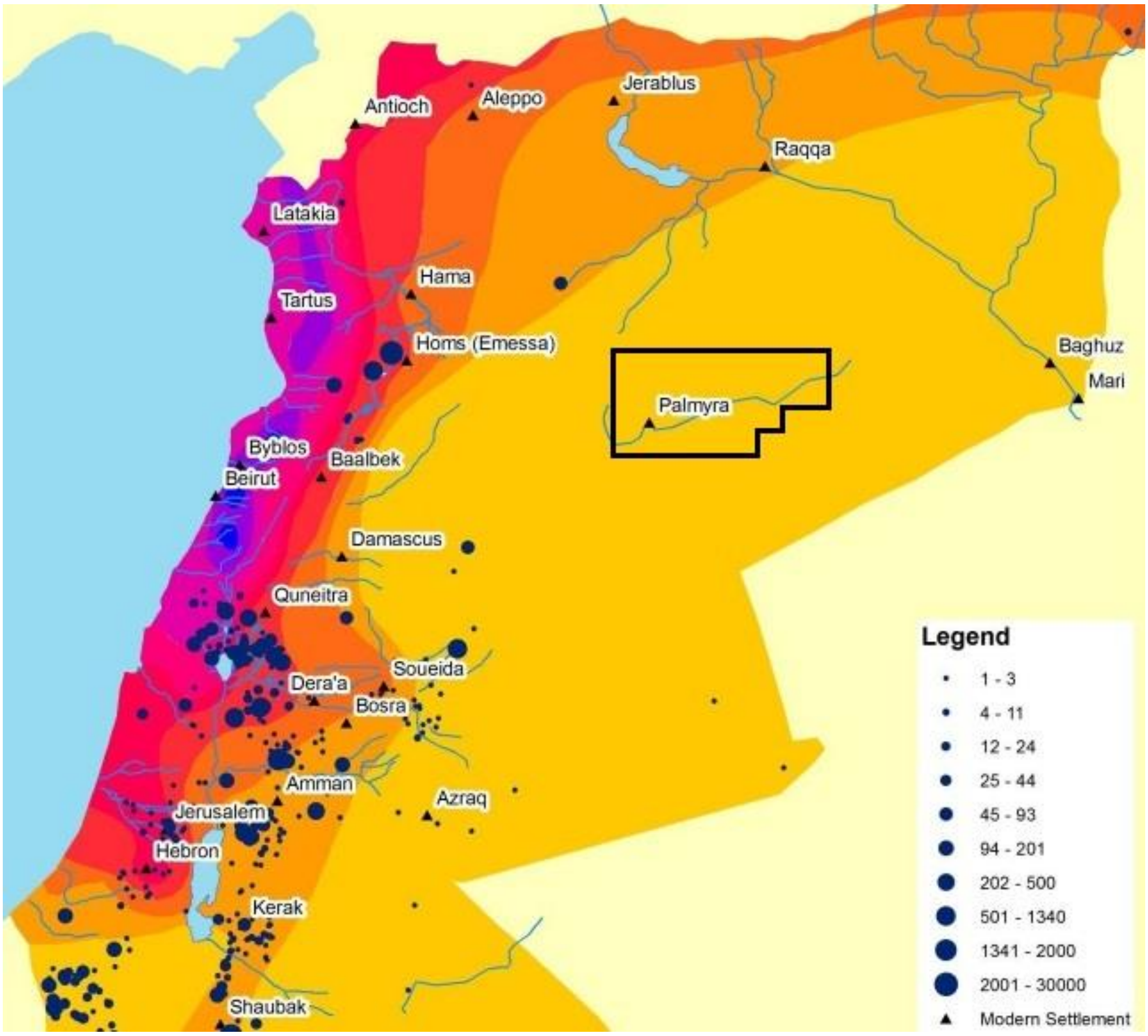



**Figure 4.22:** Map taken from Bradbury (2011, p. 156, fig. 3.30) showing the extent of known cairns/tumuli in the Levant and central Syria, which has remained the state of research until very recently. Clearly, the Palmyrene is shown as devoid of burial monuments as late as 2011, with only a limited number known from the extreme northwestern part, near Rawda (cf. Geyer et al. 1998; Geyer & Calvet 2001; Castel & Peltenburg 2007), prompting the author to strongly suggest that satellite studies of tumuli should be set in motion for the area (Bradbury 2011, pp. 164-165). The area investigated in Google Earth has secondarily been marked on the map by me, and also shows the regional extent of high-resolution satellite images in this software (as of 2012).

### 4.5.2 General comments on the Palmyrene as a region

First, it is clear that the Palmyrene is mostly a barren region more or less devoid of any vegetation larger than shrubberies and grasses, the result of a development of indiscriminate wood-cutting clearing the hills and mountains of invaluable terebinth/almond parkland (cf. 2.3.4). The only area which still has remaining woodland of any significance are certain central parts of the Jebel Abu Rujmein massive (cf. **Figure 4.21**), as well as scattered trees sheltered along interior wadis of some other mountain ranges. Jebel Abu Rujmein has been protected to some extent as a tree sanctuary and has therefore not been subjected to modern exploitation of the same intensity as other parts of the Palmyrene, and can thus be indicative of how the region originally may have looked prior to the removal of parkland and subsequent degradation of environment and increased erosion. The following description was provided by Musil as he travelled past the ruins of Khirbet Dbeiss in westernmost Jebel Abu Rujmein toward the wadi-plains north of the range:

*"Terebinth trees grow everywhere, making the country look like a vast natural park"* (Musil 1928, p. 149).

This still seems to be relatively applicable in certain very choice spots within the protected area. Another ubiquitous feature encountered in the Palmyrene are the numerous Bedouin camps, both inhabited and recently abandoned ones, which are widely distributed in the lower and more gently undulating parts of the region, as well as sometimes being situated on slightly wider banks of medium-sized interior mountain wadis They are clearly visible in the landscape, revealed by the features mentioned above (cf. 4.4.2). Without venturing any further into analogies between ancient and modern mobile populations, these imprints may indicate a potential settlement pattern of sheep and goat herders in the Palmyrene, as this would most likely have been structured and determined by topography and environment independent of time, although as iterated regarding the latter aspect, the regional conditions have undoubtedly changed substantially with modernisation (also cf. 4.5.4). However, the presence of a relatively large town at the oasis of Palmyra is another factor which perhaps not was structurally available and integrated into the regional socioeconomic network of the EBA and MBA (although cf. Bonacossi & Iamoni 2012, p. 34, note 11 – also cf. 3.2.5).

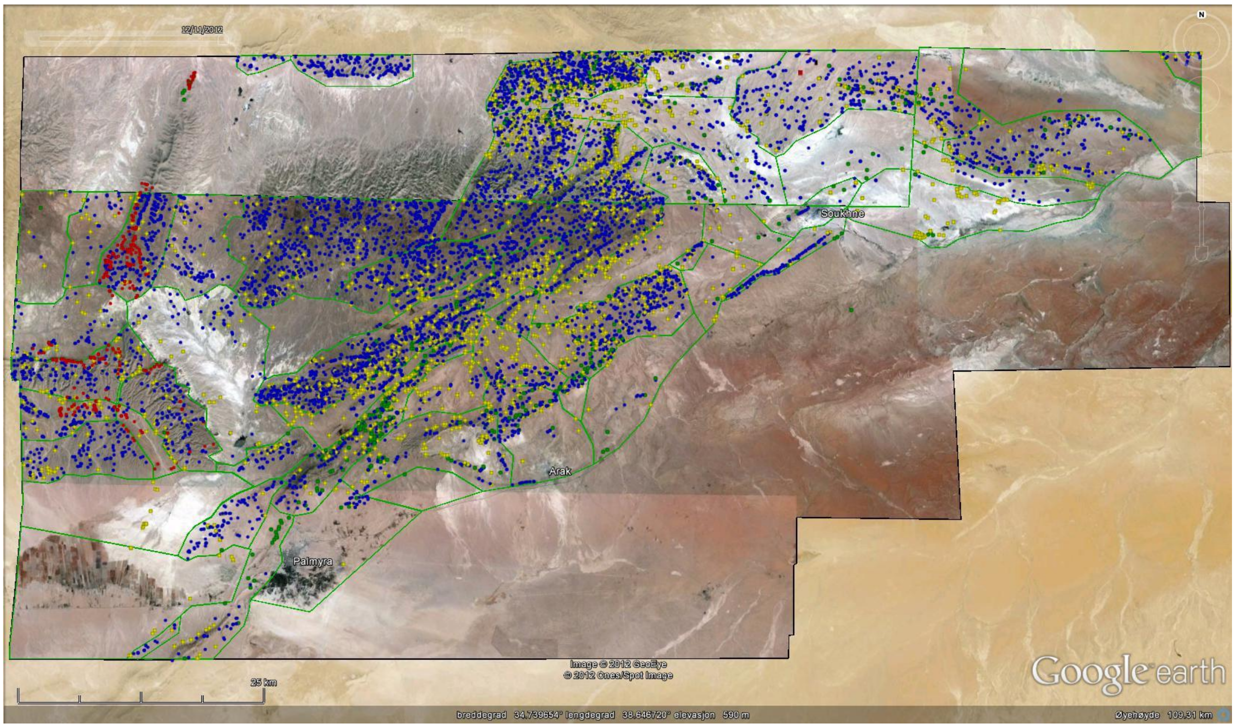



**Figure 4.23:** Map divided into the 61 areas (cf. **Figure 4.18** and appendix 4) covered by the investigation of tumuli, stone enclosures and kites in the Palmyrene, showing the total extent of the distribution of all structure types. It shows in all 7528 tumuli, 2353 stone enclosures and 426 kites recorded in Google Earth, the total number of 424 tumuli documented during the ground survey (including the complete 2008 prospection and the *cairns?* category), and 187 tumuli in Jebel Asabi (a) and Jebel Yatime (b). The total number of tumuli here is thus 8139 examples (excluding 312 tumuli recorded via satellite imagery studies in northern Jebel Merah – cf. appendix 3, p. IV).

The transection scanning of the Palmyrene also confirmed the pattern suggested by ground and satellite survey with regard to topographical contexts that are determinative for the distribution of various archaeological structures. However, interestingly, there seem to be very limited distributions of the three structure types in the immediate area around Palmyra (**Figure 4.23**). This is markedly different compared with the smaller settlement of Suhne, where all three types are present in close proximity to the town, although they are still subject to local topographical contexts, and thus relatively few in number there. Apart from a distinct cluster of kites in northern Jebel Haiyane (cf. appendix 4, p. XI), no structures to speak of can be found within a 5 km radius surrounding both the Classical and modern town, and this emptiness stretches over 10 km in the direction of the eastern quadrant. It is clearly possible that the expansion of Classical Palmyra and modern Tadmor and activities relating to this may have eradicated structures such as tumuli or enclosures in the immediate vicinity of the city, although the probable location of a Bronze Age settlement here based on MBA sources (cf.

Scharrer 2002, pp. 301-312 – cf. 3.2.5 and text **5.12**), and the discovery of EBA IV and MBA pottery deep in the tell under the Bel sanctuary (Al-Maqdissi 2000; 2009) opens up possibilities for other, unknown reasons behind the lack of structures in the surrounding foothills. It may for instance have been the case that the pattern is indicating that the domain of the settlement was spatially and conceptually separated from the domain of the Palmyrene steppe which is consequently reflected in the distribution of structures associated with a mobile pastoralist population, but this is only speculation.

Finally, large parts in the middle of the regional wadi-plains – mainly Wadi Abyad (17), Al Diwa (11), and the northeastern areas including Wadi Neqeib (46), Wadi Maiyalate (52), and Wadi Abu Nallah (54) – are more or less devoid of discernible archaeological structures of *any* type. This characteristic seems closely associated with the blindingly white colour reflected from these areas which has originated from high levels of erosion and wadi outwash, and is probably not a coincidence. A process of exponentially increased erosion may have followed the recent disintegration of the regional vegetation initiated by the destruction of the parkland, and in that case obliterating any structures which were located there, but it seems just as likely that these areas always have been characterised by high erosion and thus the actual distribution pattern of archaeological structures is detected. Incidentally, Wadi Abyad is in fact Arabic for "*white wadi"*, indicating that the landscape area has long been this way. There are also almost no tumuli, stone enclosures, or kites along the rim of the studied area, as well as in the landscape Duhur Nuqur el Habiye (20) bordering on Wadi Abyad (cf. fig. 4.22 and **Figure 4.18** – areas 1, 11, 12, 17, 20, 24, 25, 37, and 50, and southeastern parts of 35 and 36, as well as appendix 4), which is somewhat puzzling, considering the densely packed mountainous areas surrounding it, and its name implies terrain of some elevation (Arabic *duhur*, sg. *dahr* – En. *ridges*). These are the general aspects of the results and I will now present the picture regarding the particular structure types.

### 4.5.3 The Google Earth survey and distribution of Palmyrene tumuli

The total number of Palmyrene tumuli surveyed in Google Earth stopped at 7528 examples for the 61 landscape areas (cf. **Figure 4.18** and appendices 3-4). This excludes the northern third of Jebel Abu Rujmein, the northern wadi-plains, and the northern half of Jebel Shaar, which as mentioned have not been surveyed due to lack of time. The number also excludes the northern half of Jebel Merah, and the lesser mountain ranges Jebel Asabi (a) and Jebel

Yatime (b), which contain an additional 312, 162, and 25 tumuli respectively, as well as the tumuli surveyed on the ground, which numbered 404. Thus, the total number of actual and potential burial monuments in the Palmyrene at the current point of research is almost 8500 examples, excluding the northwestern, unsurveyed part. The method for spotting tumuli in Google Earth has been evaluated (cf. 4.4) and deemed to be very sound, as can be argued from the views of **Figure 4.24**, where the very clear imprint these structures can make in barren and arid areas are shown. However, the picture is somewhat more complicated in greener parts of the mountains.

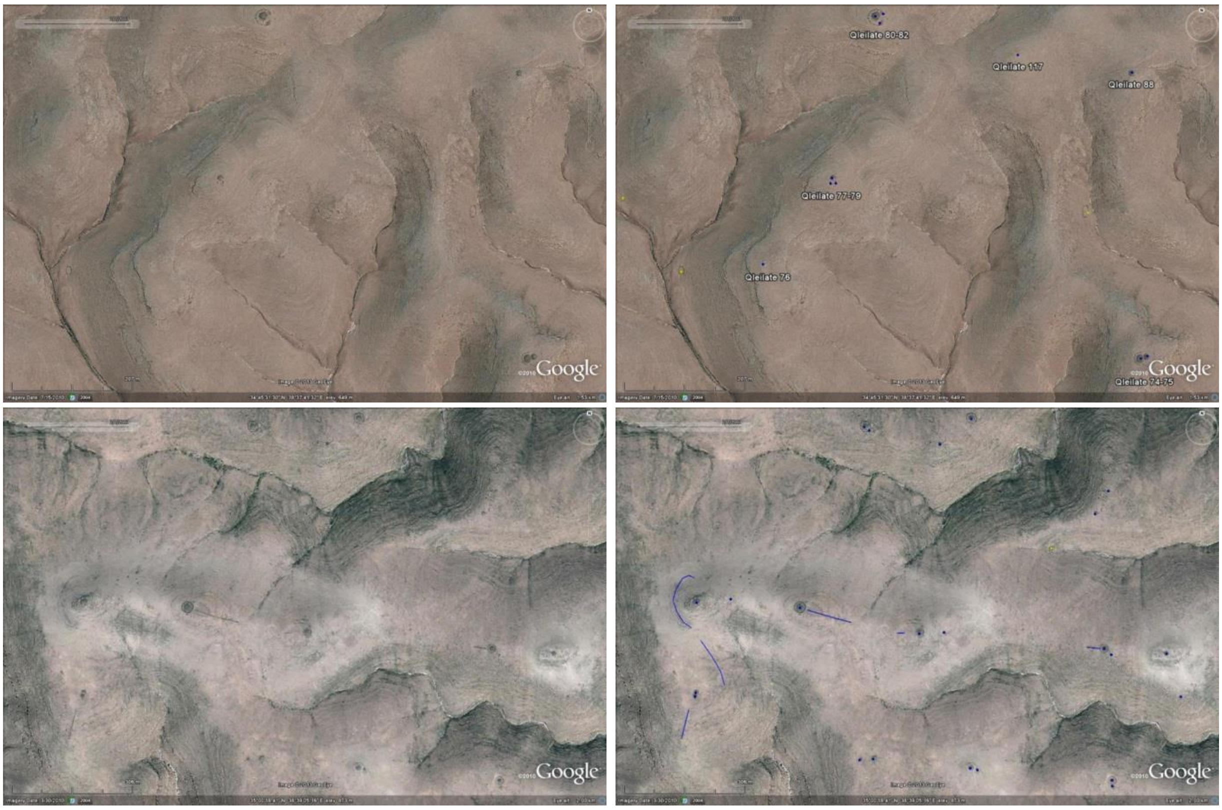



**Figure 4.24:** Google Earth view of archaeological structures documented in the Palmyrene. The top images are showing a part of Jebel Qleilate (38) lying c. 38 km northeast of central Tadmor, while the bottom ones are taken from a part of Jebel Labidah (61) lying c. 27 km northwest of Suhne. Although the probability for such structures using this method is being estimated at 70-99 % for the group as a whole (cf. 4.4.1), the features marked on the pictures with blue (right) are *clearly* tumuli of some sort. Several groups also show up as clusters with enclosing foot chains, and a small number of simple stone enclosures can also be seen (yellow). The tumuli shown from Jebel Labidah, notwithstanding being very good examples of burial monuments, even feature associated refurbishments like stone rows leading up to the tumuli, which are clearly visible, in addition to foot chains.

From such a significant number there are also clear distributional patterns to discern. First, the lack of tumuli in lower elevations and the open wadi-plains is even more pronounced than was suggested above by such archaeological structures as a group. These circumstances were also found to be the case by Bradbury (2011, p. 40) in the Homs NSA region (cf. **Figure 4.55**, areas A and B), where this type was described as largely absent from wadi bottoms. There does not seem to be more than a very few burial monuments of high probability in the large regional wadi-plain landscape areas, such as Wadi Khabar (2), Wadi Massadeh and Wadi Dalil (4), or Wadi Abyad (17), with only a small number of less certain tumuli. This is also the case for the large wadis in the eastern part of the study area. However, there are two clear exceptions to this pattern – Wadi Rahawi (18) between Jebel Merah (3) and Jebel Abu Rujmein (19), and Wadi Sahil N (57) stretching north-northwestward from Suhne (45) toward Jebel Labidah (61) and Tulul al Bayda (56). These two landscapes both contain a much higher number of probable tumuli than the other Palmyrene wadi-plains, an aspect easier to appreciate by analyzing the number of tumuli/$km^2$, which for Wadi Rahawi and Wadi Sahil N are in excess of 1.5. Contrarily, the other areas of similar type have in general quite a lot lower value than 1.0 (cf. appendix 3 and **Figure 4.29**). The tumulus distribution pattern in Wadi Rahawi is dominated by a clustering centered on the well of Bir es Sleim and just north of this, the hillocks of Rejem el Kheurbe or Khirba[12] (**Figure 4.25**). In precisely this area two aspects come together which could influence the placement of burial monuments. The area is a well, indicated by the name (*bir*), but probably more importantly, this is where four potential communication routes meet – the crossing of Jebel Merah at Taniyet ez Zerr, the main route crossing its southern foothills (**Figure 4.25**, nos. 1 and 2, also cf. 4.2.3.2, 4.3.2, and **Figure 4.16**), the regular north-south route along the east side of the Jebel Merah range, and the valley crossing Jebel Abu Rujmein called Alhejzer by Musil (1928, p. 149) past Khirbet Dbeiss also mentioned above (cf. 4.5.2). Thus, this spot can be characterised as a combination of being an important crossroad *and* a well (cf. 4.2.3, pt. d).

[12] This designation, i.e. *Rejem* (pl.) and *Rujm* (sg.), can interestingly indicate an area of tumuli, as can several other topographically distinct areas in this part of the Palmyrene. It actually means *stone piles* or *stone heaps*, in many cases denoting *tumuli* or *cairns*. For instance, Rejem el Kheurbe/Khirba thus means *stone piles of the ruin/abandoned settlement* (there is some variation in the meaning of the last noun). Another such name is just east of Wadi Rahawi, in the southern part of Jebel Abu Rujmein (19), just where this borders on Duhur Nuqur el Habiye (20), where a hilly region filled with tumuli is called Rejem Saabun, which can be interpreted as *highland of stone piles*, i.e. *tumuli.*

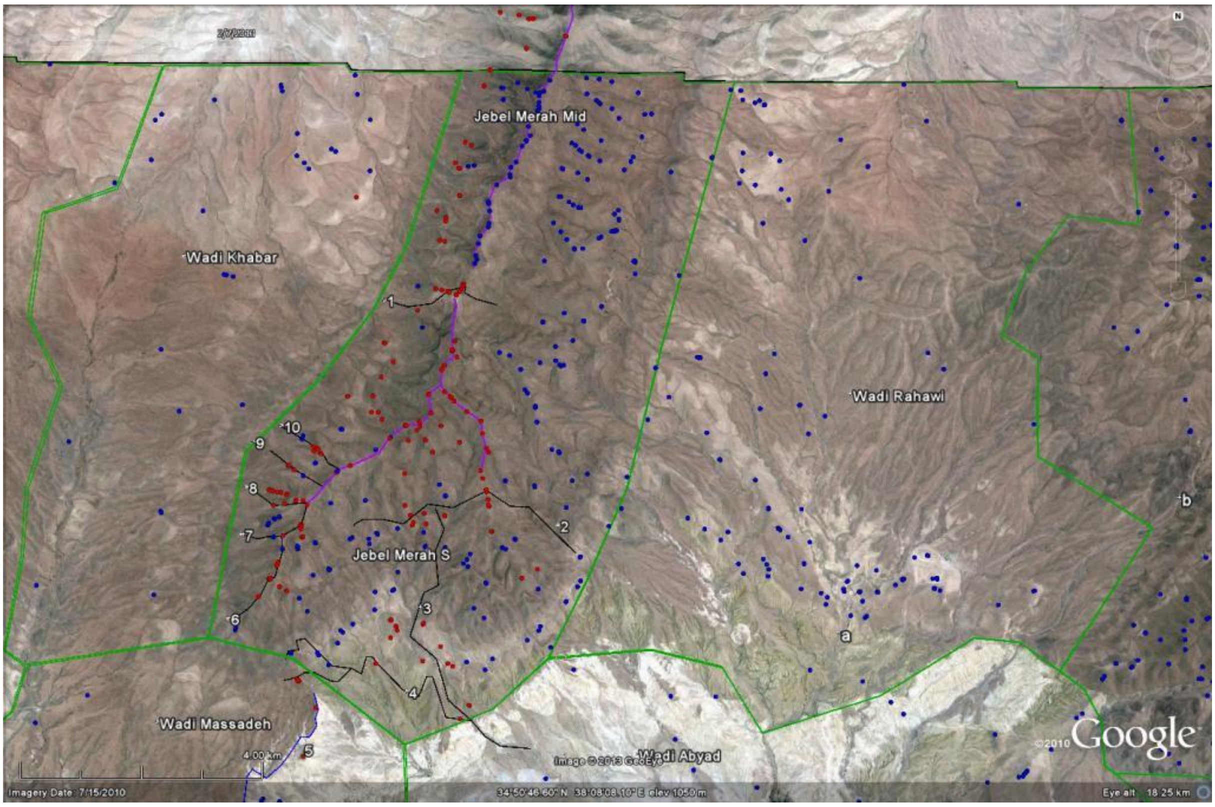



**Figure 4.25:** Satellite view of Jebel Merah and surrounding areas showing tumuli found both by fieldwork on the ground (red) and using Google Earth images (blue). There is a clear cluster of burial monuments around the well of Bir es Sleim (a) in Wadi Khabar or just north of it, the escarpment of Rejem el Kheurbe, but otherwise the large wadis or plains are very scantily populated by tumuli. This area was mentioned by Musil (1928, p. 149) as having surrounding hills being littered with ruins as well as them being tree-clad. The routes meeting at this point (a) are: 1) Taniyet ez Zerr, 2) the Jebel Merah trans-foothills route, b) the Alhejzer valley entrance as well as the general north-south route along Wadi Rahawi.

The reason for Wadi Sahil having a relatively high density of tumuli is more uncertain, partly because I am less familiar with the area, known routes, and its local natural features which can have influenced location. However, since the northern end of this wadi-plain meets up with mountain ranges containing *very* high densities of structures – the northern Jebel Abu Rujmein massive and in particular Jebel Labidah (61) – and stretches from a presumably important oasis, Suhne[13], with its springs and wells, a high communicative importance can be hypothesised for this landscape area. The northern end of this wadi is also where the important regional cross-chain route of Wadi Qutqut exits from the Jebel Abu Rujmein

[13] Musil (1928, p. 83) mentioned also here: *“(...) the spring of al-Wâz’ijje by the foot of a small hillock near a pile of débris from an old watchtower”* – i.e. again a reference to one of the burial cairns, this time at Suhne, and possibly near Sheikh Wassil, as the toponyms are rather similar.

massive into Wadi Sahil and the northern plain, linking it with Duhur Nuqur el Habiye (20) and ultimately Wadi Abyad (17). This wadi route (**Figure 4.26**, no. 3) contains itself a high number of tumuli, although the pass is spatially divided in this analysis between, and incorporated into, the areas of Jebel Hawit er Rass N (60) and Jebel Taniyet es Safra (59) (cf. the border between these areas in appendix 4, pp. XXV and XXXVIII-XXXIX). Finally, and perhaps most importantly, it forms the southernmost part of the route between Suhne, Taibe, Resafa, and the Euphrates valley (**Figure 4.26**, no. 6).

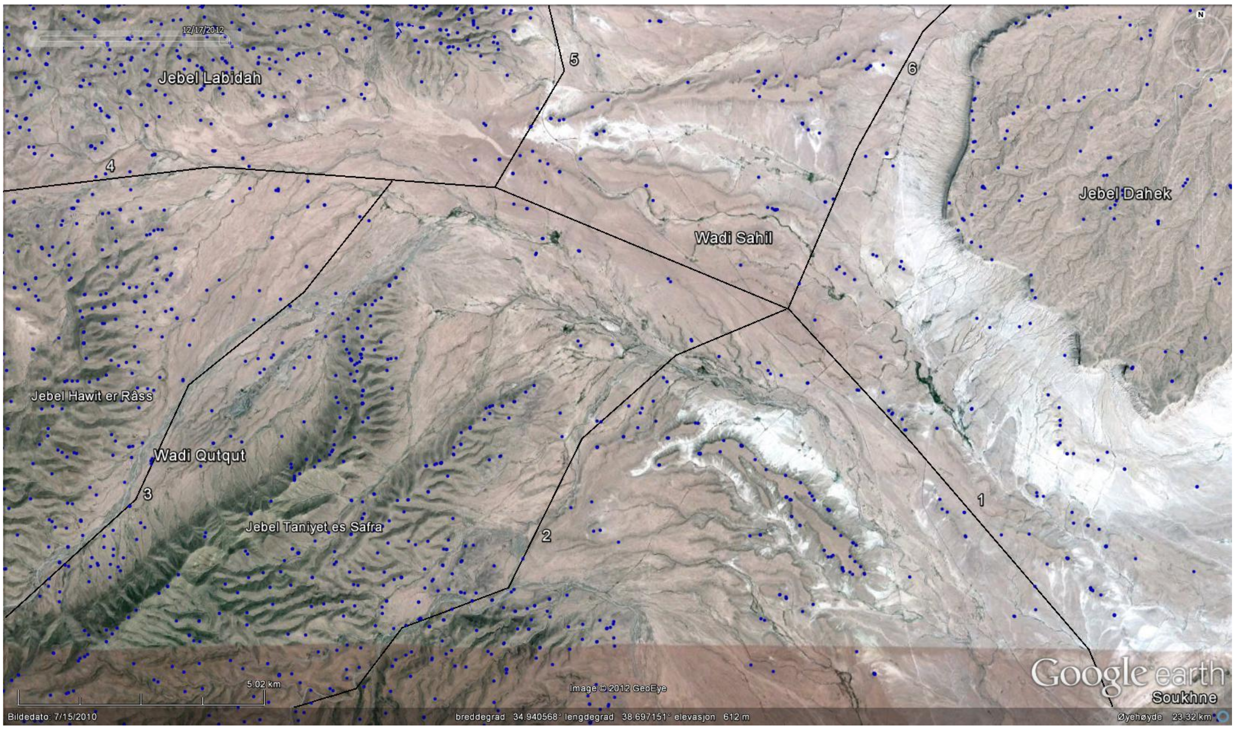



**Figure 4.26:** Tumuli distribution and topographically determined routes (stylistically presented) in the Wadi Sahil area. Suhne is in the bottom corner on the right, while Jebel Labidah and the Jebel Abu Rujmein massive are found in the top and bottom parts of the left side of the image, respectively. The routes as topographically determined by wadis are: 1) Wadi Sahil, 2) Wadi Rwahet Beyda, 3) Wadi Qutqut, 4) Wadi Abu Hayyah/Al Qudaym (route westward), 5) Wadi Nuwayr (route toward northwest), 6) Tulul al Bayda (route toward northeast). There is clear clustering along these lines in contrast to other large Palmyrene wadi-plains.

The other significant area which cannot be characterised as a mountain range, but still shows a high density of burial monuments is Jazal, as indicated by the ground survey (cf. 4.2.3). However, this landscape (area 8) is perhaps not as flat as the larger wadis, with several gently rolling hills and hillocks interspersed by smaller wadis, and can therefore with some justification be described as *hilly*. While the ground survey recorded a rather high number of tumuli in a limited area here, the Google Earth study has augmented the picture drastically, resulting in Jazal emerging as an area with the second-highest density of burial monuments in all of the Palmyrene, containing over nine per km$^2$ (cf. appendix 3, no. 8). On the other hand, nearly all of these are located in the elevated zones of the landscape, and very few are found in low-lying areas. Again, as has been mentioned above, the presence of an oasis, as well as this landscape area being a crossroad and meeting point of several communication routes, seems to be the underlying basis for such a high number of tumuli[14]. For instance, when **Figure 4.7** – ground-surveyed structures in the Jebel Abyad area – is compared with **Figure 4.27**, which shows the total extent of tumuli in this area, the association between burial monuments and communication routes looks highly relevant, whereas several of the interior parts of nearby Jebel Abyad, which are situated some distance from and beyond the visible perspective if seen from the cross-chain routes, are clearly lacking in tumuli.

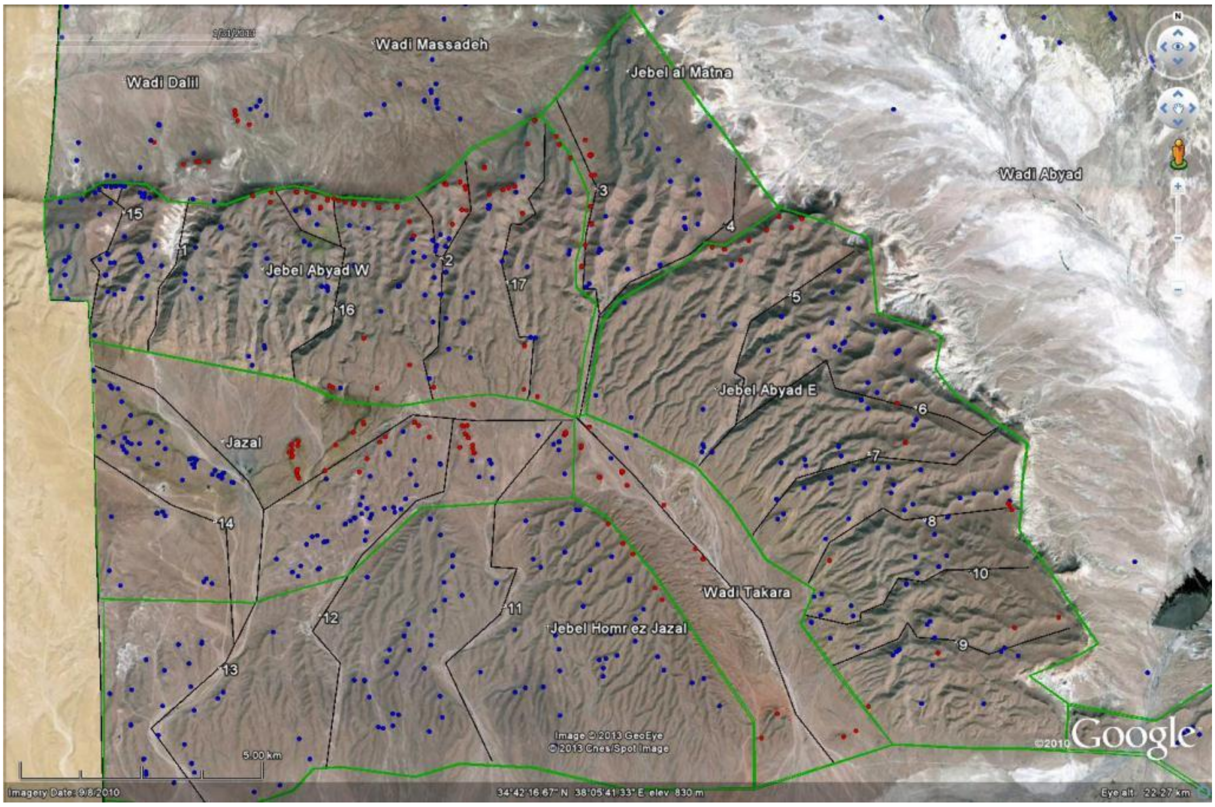



**Figure 4.27:** Satellite view of Jebel Abyad and surrounding areas including tumuli found both in the field (red) and via Google Earth survey (blue). In addition to the wadi routes marked on **Figure 4.7**, the map also shows: 10) Wadi Yetimeh, 11) Wadi ez Zaab, 12) Wadi Jeimane, 13) Wadi el Jazal S, 14) Wadi Alali Ghreibun S, 15)

[14] Musil (1928:134) used these words for Jazal: "*(...) the spring 'Ajn Ğezel, past which runs the shortest road from Tudmor to Umm Hmejme and 'Užeribât"*. The latter two toponyms are probably those now called Umm Qbaybah and 'Uqayribat along the road between Palmyra and Salamiyeh.This description thus confirms the presence of both a spring and an important communication route here, at least during the Ottoman period.

Wadi Alali Ghreibun N, 16) Wadi Mazrur, 17) Wadi Matna el Gharbiye. The association between burial structures and communication routes based on topography is thus even more pronounced with a larger data set. Note also the near-total lack of structures in Wadi Abyad.

Such a perspective is shown in **Figure 4.28** (left), where the northern part of Wadi Mazrur (**Figure 4.27**, no. 16 – also cf. **Figure 4.9**) is shown on a photography and the tumuli are seen lying along the ridgeline, not visible from any other area than this cross-chain wadi route and its surrounding mountain ridges. **Figure 4.28** (right) shows from where the picture has been taken and the extent of the motif, while a close-up of the same cone of perspective is vaguely visible just above the *Jebel Abyad W* mark in **Figure 4.27**.

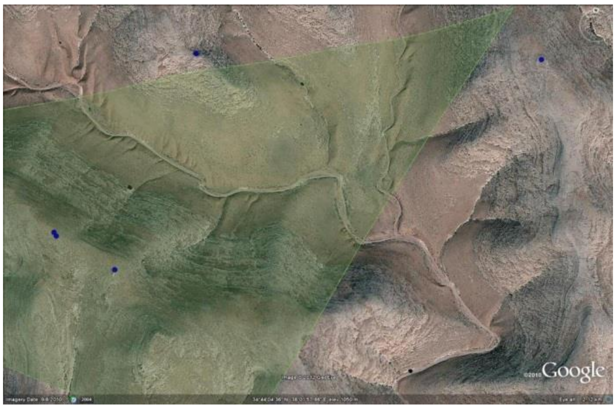



**Figure 4.28:** Picture of the northern end of Wadi Mazrur, an interior cross-chain wadi and ridgeline in Jebel Abyad (left), just short of where the pass crosses the northern wall of this mountain range and enters the wadi-plain of Wadi Dalil. A Google Earth view of the landscape captured by the lens (translucent green) is also shown (right). It is clear how the tumuli – which are the two points jutting upward from the ridge in the middle of the photo, and the three blue points on the satellite photo – along the ridge are positioned to be visible from this route, as well as hemming it in. Incidentally, one lone example of the mere handful of terebinth trees still lingering on in this range (marked with a black rectangle) is also visible on the mountain slope (photo: Torbjørn Preus Schou, 2011).

However, apart from these two wadi-plains, the vast majority of the tumuli follow the same distribution pattern as that suggested by the ground and satellite surveys, i.e. clear association with a particular part of the topography directed toward communication corridors. This has resulted in a number of patterns regarding burial monuments documented by the Google Earth survey which is paralleled in the ground survey record – for all numbers, cf. appendix 4:

- Many tumuli are situated along the midpoint of high mountain ridges where these drop steeply down into wadis, a manner very similar to the pattern found along the northern wall of Jebel Abyad (5-7, cf. **Figure 4.9**) and on the main ridge of Jebel Merah (3).

The landscape areas exhibiting these aspects are e.g. the east wall (Jebel Bir es Saiyah) of Jebel Abu Rujmein (19) and the west wall of Jebel Hawit er Rass (30 and 60) between which runs the distinct and important wadi-pass of Fayej Taniyet el Hawa. Another clear example is the Wadi Qutqut (cf. **Figure 4.26**, no. 3), where walls on both sides are sheer and have a number of tumuli located along the ridges of Jebel Taniyet es Safra (59), and Wadi Fayej (39) over which the wall of Jebel Satih looms (40).

- There are also several escarpments or hilly parts of the Palmyrene running along regional topographically determined routes which contain relatively large numbers of tumuli, a characteristic which is paralleled in e.g. the ground survey of Jazal (8) or the hills of Jebel Homr ej Jazal (10). Landscape areas such as the northern edge of Jebel Qleilate (38) and Dahr el Hazem (44), as well as the hilly southern part of Wadi Qseibe (34) fit well within this category, all located along the important route running between Palmyra and Suhne.

- Cross-chain wadis often have tumuli located on the plains surrounding their entrances and exits, in addition to on the nearby foothills there. Examples from the ground survey include the northern ends of Wadi al Masek and Wadi Takara, as well as the smaller wadis in Jebel Abyad (cf. **Figure 4.27**) and the northern foothills of Jebel Merah (cf. Meyer 2008 – also cf. appendix 2, pp. III-IV). For the greater Palmyrene, particularly well-illustrating examples of this aspect can be found in the northern end of Fayej Taniyet el Hawa (60), but especially the northern part of Wadi Qutqut (cf. **Figure 4.26**, no. 3). Additionally, all along the northern part of Wadi Fayej (39) a number of larger tumuli are located down on the plain, and the only cross-chain wadi called Wadi el ‘Asran in the western part of Jebel Labidah (61) also contains some tumuli lying along its banks in the bottom, quite in sharp contrast to the rest of this densely tumulus-filled mountain range, similarly to Wadi Takara (8).

- Several mountain ranges have areas of the interior which contain very few burial monuments or none at all. These areas have usually in common that they are not visible from the communication lines constituted by larger wadis or by the smaller cross-chain wadis in regions of lower elevation within or bordering onto them. This is particularly striking for the ground survey in parts of Jebel Abyad (cf. **Figure 4.7** and

**Figure 4.27**), paralleled in a number of the mountain ranges covered by the Google Earth survey. For instance, Jebel Marbat el Hassane (16), Jebel Dahek (48-49 and 55), Jebel Hawit er Rass (30 and 60) and Jebel Abu el Hawr (31) all contain internal areas which are seemingly lacking in tumuli (cf. appendix 4). Although it is possible that the distinctive hue caused by either vegetation or geology in the latter two ranges may have created instances of second-guessing and doubt with regard to plotting a feature as a monument, the focused scan and methodical experience[15] make it probable that these internal ridges actually contain very few and scattered tumuli.

- The eastern and the western parts of the investigated section of the Palmyrene, i.e. of the areas of high-resolution imagery, have far fewer tumuli than the central regions. Jebel Shaar (1) and Jebel Dahek (48-49 and 55) are both very scantily populated compared with the more centrally located mountain ranges, and in some cases have lower densities of tumuli even compared with some of the wadi-plains (cf. **Figure 4.29**). Thus, for the Palmyrene as a whole, tumuli are generally distributed along the mountains in a wide belt stretching from Palmyra north- and northeastward in the direction of Raqqa. There are somewhat fewer monuments in the easternmost region, north and northeast of Suhne, while tumuli are almost totally lacking in the northwestern corner, i.e. in Jebel Shaar.

[15] The late point in the Google Earth survey at which these landscapes have been investigated meant that my experience as surveyor of Google Earth images of the Palmyrene was significantly higher than it was at the outset using this particular method.

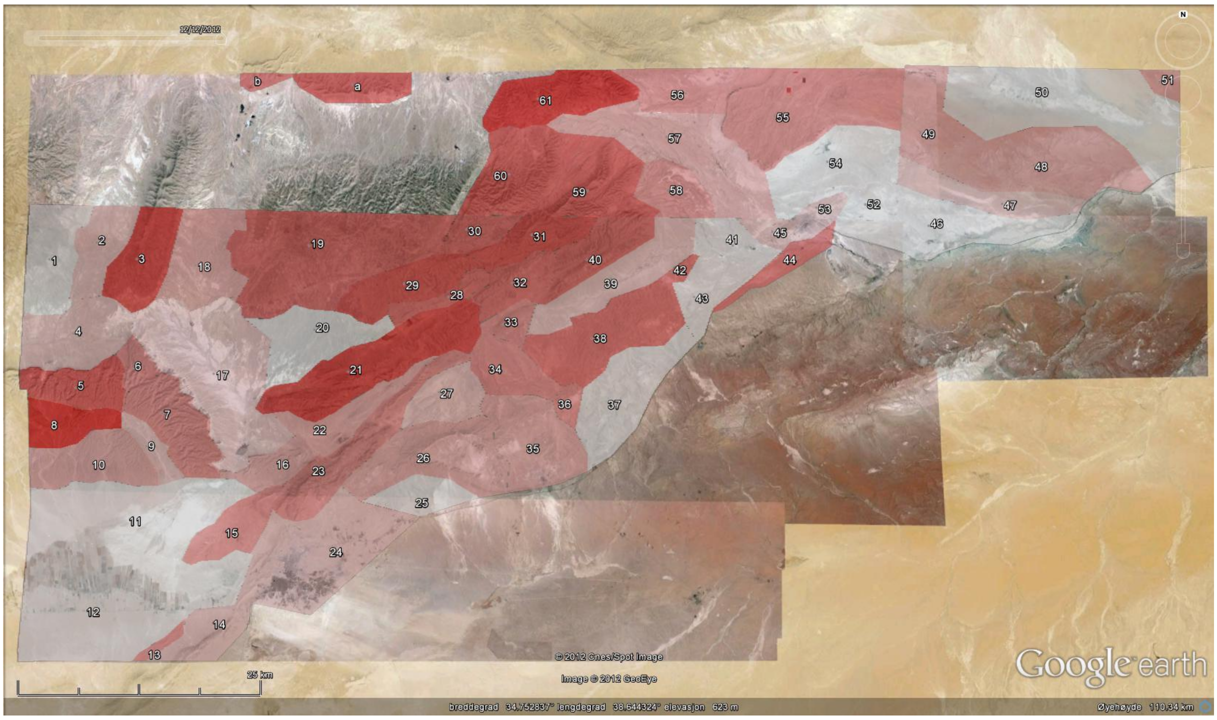



**Figure 4.29:** Tumulus densities (nos./ km$^2$) in the 61 area landscapes investigated by the use of Google Earth, as well as the preliminary ones (a/b). See appendix 3 (p. IV) for key to the colours associated with the various tiers of density here. There are clear concentrations in the central mountain ranges, like the Jebel Abu Rujmein massive and Jebel Merah, but also the important oasis and crossroad Jazal is prominent in this respect. However, the landscape area which stands far above the other areas is Jebel Labidah, which contains over 11 tumuli per km$^2$. Interestingly, tumuli densities clearly decrease east (e.g. 48-49), northwest (1), and partly south (e.g. 13-14 and 35) of the central Palmyrene, with a clear trend of high density toward the north-northeast.

The main points to deduce from these characteristics are that the communicative aspect must have been highly important for ancient Palmyrene mobile pastoralist groups, with a focus on topographically determined routes for travel through the landscape. This is emphasised when comparing the emptier interior regions of Jebel Abyad, which do not have any direct *visual* association with such routes and presumably therefore very few or no burial monuments, with Jebel Merah, of which most parts can be seen from both Wadi Khabar and Wadi Rahawi on each side of the mountain range and does not contain any sizable areas *without* tumuli. In fact, nearly all ridge lines there seem to exhibit the bumpy profile created by series of such burial monuments. This is also the case for other ranges in the Palmyrene. The central Palmyrene itself must on this basis have been important on a regional scale - or rather a wide belt stretching northeastward from the oases of Jazal and Palmyra toward Taibe with a slightly more northern tendency than eastern, with central mountains densely populated with tumuli like Jebel Labidah (61) and the extended Jebel Abu Rujmein massive (19, 29-31, and 59-60).

This is emphasised by the distributional trailing-off with regard to tumuli for the east-northeastern parts of the region (46-51), i.e. toward Jebel Bishri, and particularly striking is the abrupt drop for the northwestern part, i.e. Jebel Shaar (1). There are indications that special places were important and thus merited clusters of tumuli, either due to resource access or perhaps some ritual significance now lost, or both. An argument for complex causality regarding the placing of these clusters is that some of the natural features (e.g. springs or wells) in the landscape with which few or no tumuli are associated seem similar in nature to those that *do* contain clusters of tumuli, hence suggesting that there are further aspects influencing these patterns, potentially of a communicative and/or ritual kind. Finally, the Google Earth survey was able to detect significant differences in size and form of burial monuments of the tumulus type. The total extent of grouped tumuli is probably not recorded fully in most cases, as many of the smallest and least conspicuous ones are not visible on the images (cf. 4.3.2.2 and **Figure 4.14**), but several clusters have nevertheless been documented. Large tumuli, presumably monumental ones (although obviously not measured), often show a clear and substantial foot chain, sometimes with some form of auxiliary stone line feature, and quite often with satellite tumuli around them (cf. **Figure 4.24**). Although these are usually located on peaks or other striking topographical features, this is not always the case, with some being located in the wadi-plains near nexuses of or along probable regional routes (e.g. Wadi Fayej or Wadi Sahil). There also seems to be certain differences in tumulus context and sizes when it comes to the various landscape areas or location within the Palmyrene as a whole. In the interior and western parts of Jebel Dahek el Gharbi (55), the tumuli are mostly of modest size and more often than further west situated near small- to medium-sized wadis, either very isolated or in small clusters. This is as mentioned above an area which is generally scantily populated, although with somewhat higher density than the empty Jebel Shaar (cf. **Figure 4.29** and **Figure 4.30**). Interestingly, this landscape contains a single line of somewhat larger cairns along a modern track where also modern Bedouins have placed both their present and relatively recent camps, even though the surrounding hills are devoid of tumuli. Can this line represent a route or an area which is particularly useful for pastoralists in the local terrain? Without possibilities of ground survey it would have to remain intriguing. On the other extreme, although regionally in close proximity is Jebel Labidah (61) which features a peculiar pattern of tumuli contexts. Here are found recurring instances of one large and presumably monumental cairn, often with a substantial foot chain, and associated with it, regularly situated on this foot chain a smaller, but still fairly large tumulus. This combination of pairings is also found in other mountain ranges, but not nearly as frequent as in Jebel Labidah. Additionally, a stone row leading up to these cairn complexes is also fairly common there, although perhaps not as frequent as the foot chains. Several such sets of tumuli can be found on a ridge or plateau, creating an extensive and peculiar tumulus field (cf. **Figure 4.24**, bottom). Of course, both isolated tumuli and groups of three or more are also found in Jebel Labidah. The full picture emerging from Google Earth survey of tumulus distribution in the Palmyrene highlands is shown in **Figure 4.30**, while a more detailed picture is available for each of the landscape areas in appendix 4.

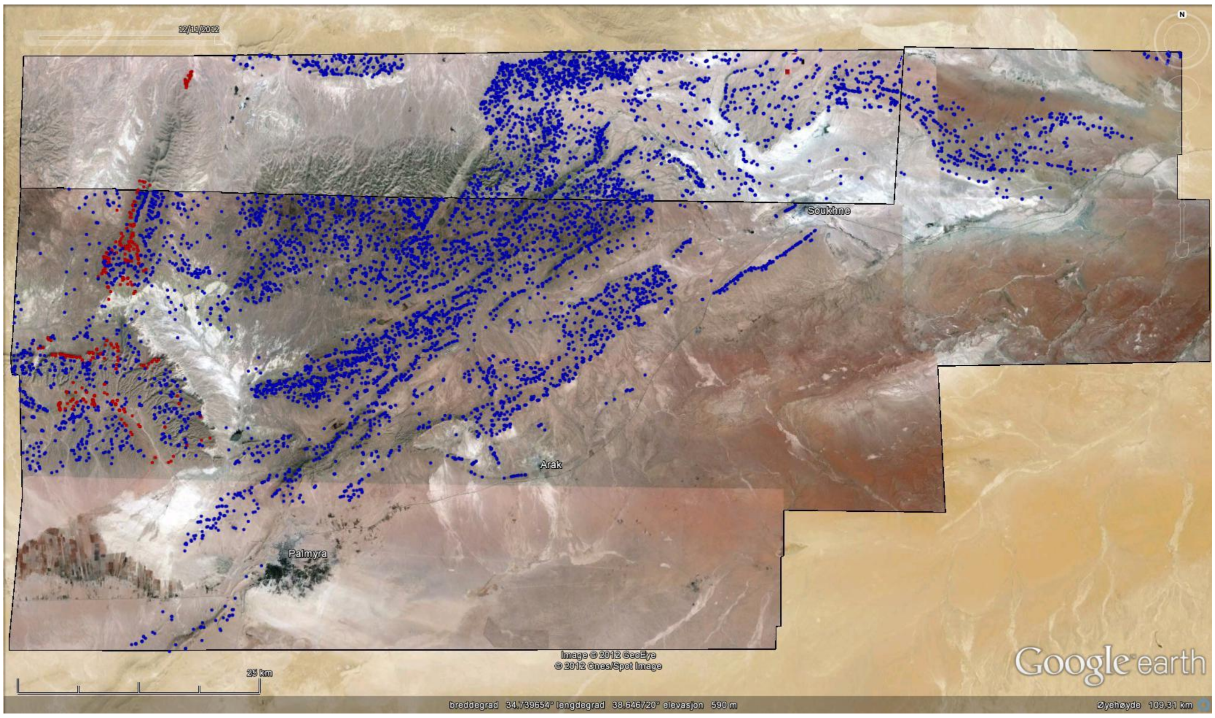



**Figure 4.30:** Full distribution map of tumuli in the Palmyrene within the 61 landscape areas marked in **Figure 4.18** (blue), including those surveyed on the ground (red), as well as the areas a/b.

### 4.5.4 The Google Earth survey and distribution of Palmyrene stone enclosures

Stone enclosures are widespread throughout the Palmyrene, but the topographical context seems to be almost opposite of the general distribution of tumuli. They are also more enigmatic in function than the burial monuments, and similar archaeological structures in similar Near Eastern contexts have therefore been explained as structural manifestations of a number of activities in arid or so-called *sub-optimal* (cf. Bradbury and Philip 2010; Bradbury 2011) landscapes. Although stone enclosures were incorporated by Zarins (1992) into his *Bronze Age nomadic technocomplex* (cf. 4.1.1), relatively little research has actually been carried out regarding these archaeological structures – at least compared with kites and tumuli – and their function is debated. However, they do seem to be quite a common phenomenon in arid regions of the Near East (e.g. Avner et al. 2003; Braemer et al. 2004), as well as in at least parts of Africa, something easily deduceable via a quick prospection of the corresponding Google Earth imagery. As mentioned, the designation of this structure type has been chosen to be *stone enclosures* to make sure that no functional connotation is inadvertently attributed to them, merely providing a structural description (cf. 4.1.1). The total number of stone enclosures recorded in the Google Earth survey of the Palmyrene amount to 2353 examples (**Figure 4.30**), excluding the northern part of Jebel Merah, which according to the satellite imagery study adds a further 102 stone enclosures. Jebel Asabi (a) and Jebel Yatime (b), while surveyed for tumuli, has not been covered with regard to the recording of stone enclosures, and although a small amount of documentation was carried out both in 2008 and 2009 (cf. Meyer 2008; Meyer 2009), this structure type was not prioritised in the ground surveys, particularly by the prehistoric team of the Palmyrena project. Of course, as the case is for the whole Google Earth survey, the northwestern part of the Palmyrene was not covered – only the 61 landscape areas in **Figure 4.18**.

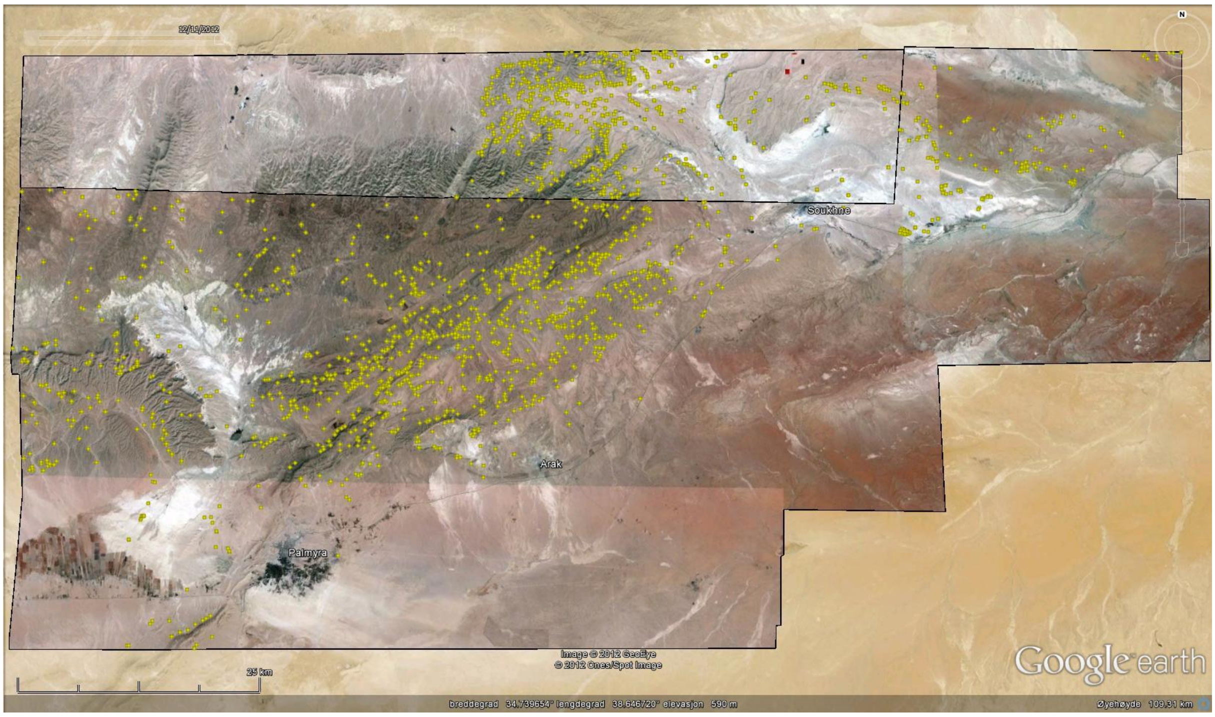



**Figure 4.31:** Distribution map of stone enclosures in the Palmyrene. There are clear differences from the pattern exhibited by tumuli. Whereas the latter are mainly situated along ridges and on peaks of hills and mountains, the

stone enclosures have a strong association with small- to medium-sized wadis and the slopes above them. Note e.g. the very low density of stone enclosures in the Jebel Abu Rujmein massive.

#### *4.5.4.1 Distributional patterns of Palmyrene stone enclosures*

Once more, the large number of structures makes it possible to detect patterns in the data set. There are distinct variations in the regional densities of stone enclosures, as is clearly discernible in **Figure 4.31**. The central region of the Palmyrene high-resolution satellite window seems much more densely packed than is the case for the other parts, keeping in mind that no surveying was carried out below a diagonal line across the image, i.e. the southeastern steppe (e.g. cf. **Figure 4.23** and **Figure 4.55**). While there are stone enclosures in both the eastern and western parts, thus in the Jebel Abyad and Jebel Merah regions and the extended Jebel Dahek massive (49-50 and 55), there are not nearly as many as in central parts. It is also surprising that there seem to be so few of them in the Jebel Abu Rujmein massive (in particular the areas 19-20 and 30-31), which otherwise generally is an area of high activity regarding tumulus construction – although Duhur Nuqur el Habiye (20) remains a landscape area of minimal activity (cf. **Figure 4.29**). In fact, the distribution seems generally to be very limited west of Wadi Qutqut (**Figure 4.31** – cf. **Figure 4.26**, no. 3). The region south of Jebel Mohammed ibn Ali is also very scantily populated with stone enclosures, apart from a small cluster associated with Jebel Hayane. Similarly to the tumulus distribution, a wide radius around Palmyra is devoid of any structures, as is the southeastern rim of the surveyed part of the Palmyrene. This is perhaps more surprising than the case is for tumuli, as the topography here is very similar to that otherwise associated with stone enclosures (see below). On the other hand, the southern and eastern central regions are packed with these structures, both in the interior of certain mountain ranges, e.g. Jebel Safra (21) or Jebel Qleilate (38), as well as in the large regional wadis, like Wadi Fayej (39) and Wadi Sahil (41 and 57). The full picture (fig. 4.29) suggests a focus along a wide belt between Palmyra and Suhne centered on the first of these two wadis and spilling over into the valleys of the adjacent and parallel mountain range. Beyond Suhne, the dense spread of stone enclosures veers off northward into Wadi Sahil, although still widely found in the surrounding foothills.  However, the number is rather limited along its eastern edge, overshadowed by the vertical western cliff of Jebel Dahek. Finally, the distribution pattern enters its densest assemblages in northern Wadi Sahil N (57) and Jebel Labidah (61), which once again stands strikingly out as a landscape heavily concentrated with archaeological structures.

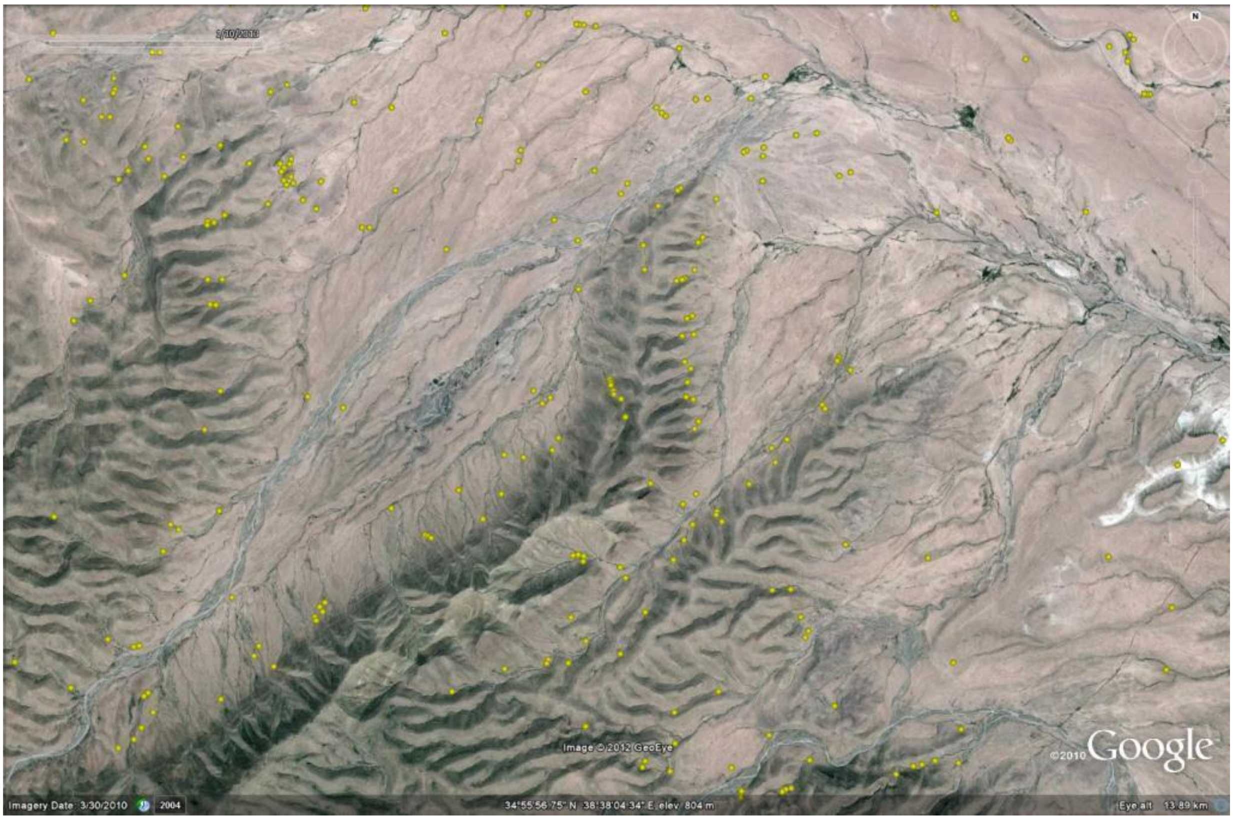



**Figure 4.32:** The frequency of stone enclosures is relatively low in the western and central parts of the Jebel Abu Rujmein massive (cf. **Figure 4.31**), although it picks up near the outlet of Wadi Qutqut, where this meets northern Wadi Sahil and the general northern wadi-plains (cf. **Figure 4.26**, nos. 3 and 1). The association with the mountain sides, slopes, and small wadis is evident in this image, and thus it seems likely that many of these structures could have a functional link to water run-off.

What becomes clear when examining the local topographical context of this structure type is that, although there are variations in placement, they mostly conform to a pattern which seems closely associated with the local wadis. The stone enclosures are, contrary to tumuli, largely confined to the low-lying parts of the Palmyrene as a whole, and in particular associated with the small- to medium-sized wadis which are found in their thousands on a regional basis. However, they are not situated at the lowest point of these topographical features, where the channel and main body of water would be running intermittently. Instead, the Palmyrene stone enclosures are mainly located on sloping ground of varying degree, either along the banks of the wadis or higher up in steep-sloping hillsides, skirting the margins of the foothills, i.e. lying right along the borderline between hill and plain (**Figure 4.32**). However, a small number of them can also be found on low, rolling hillocks in the larger wadi-plains, e.g. in Wadi Sahil N (57), southwestern Wadi Fayej (39), or Dahr el Moussoum (27) (**Figure 4.33**).

In my view, this specific topographical provides hint to one of their main functions – small-scale horticulture (cf. 4.5.4.2).


**Figure 4.33:** Overview of the extended area around the landscape areas Wadi Fayej (39 – left) and Dahr el Moussoum (27 – right). The link with slopes and thus presumably water run-off is also clear (compare with fig. 4.32). Note how many stone enclosures are lined up along the slopes below the wall of Jebel Satih (40) in the centre of the left image, as well as the number of enclosures in the minor wadis of Jebel Qleilate (38) on the same image, bottom right. Again, evidently only a very few of these structures are located in the flatter bottom of these regional wadi-plains, and none at all along the ridge lines of nearby mountain ranges.

### *4.5.4.2 Interpretations and comparison with similar structures*

The Palmyrene stone enclosures are probably similar or even parallel to the structures which were aptly called *irregular clustered enclosures* by Bradbury (2011, p. 267), quite a good and descriptive designation, although they are broadly circular in plan and just as often lie in relative or clear isolation (cf. **Figure 4.34**). Clusters denote here two or more conjoined and interlocking compartments or cells within a single structure, rather than a scatter of enclosures within a limited area. These may contain compartments of varying sizes, although usually they are relatively even, and while the number of these commonly does not exceed six or seven, a few clusters have dozens of adjoining enclosures. Each stone enclosure, i.e. the individual compartments, usually have a size range of about 5-20 m in diameter, and the higher the number of conjoining elements, generally the lower the diameter. Again, this is quite similar to the discoveries by Bradbury in the Homs NSA (cf. **Figure 4.55**, areas A and B), which she described in this manner:

*“They vary in average between 30-40 individual units with diameter of each of 5-20 m, and show no evidence of clustering around a central open area”* (Bradbury 2011, p. 285).

However, the large number of individual compartments in her material is rather the exception in the Palmyrene, and mainly found in the large eastern wadi-plains, particularly the white Wadi Neqeib (46). Castel et al. (2008) also recorded stone enclosures in the region around Rawda, c. 40 km northwest of the area surveyed here in Google Earth (cf. **Figure 4.55**, area C), which they merely called *enclos*, although they pointed out that these also occur in multiples of two and three and are irregularly shaped. Based on their descriptions I would suggest that these structures are of the same general type as the stone enclosures in this chapter. The map of the microregion around Rawda (cf. Castel et al. 2008, p. 37, fig. 15 – also cf. **Figure 4.55**) also indicated that many of their *enclos* are located just above the *faydas* – thus presumably where the ground is sloping – as well as in smaller wadis. However, some of the enclosures in their data set also seem to be located on the ridges[16].

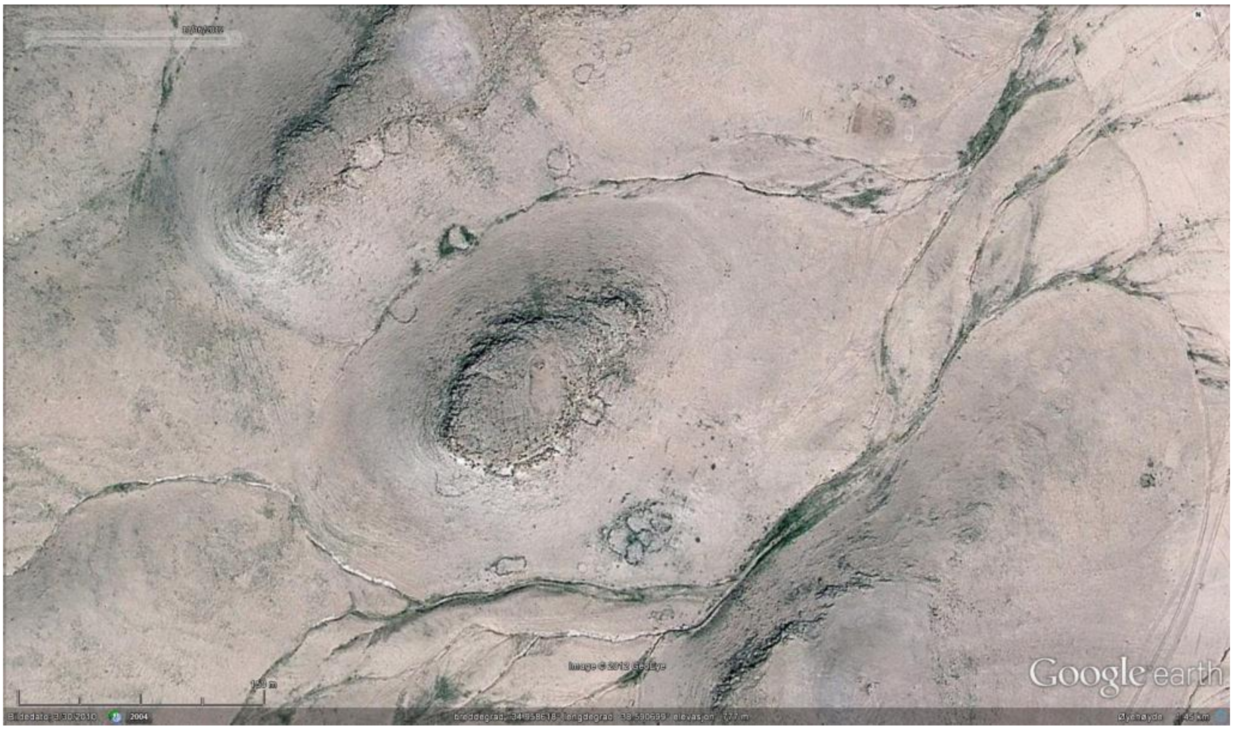


**Figure 4.34:** Various manifestations of stone enclosures in the Palmyrene, specifically located in the northeastern part of Jebel Hawit er Rass (60). They are all clearly situated on the sloped ground, and some in rather steep areas all the way up under the mesa plateaus. Their irregular shapes as well as the varying degrees of clustering within a very limited area are evident.

[16] It must be pointed out that the figure in Castel et al. (2008) is not a proper topographical map with contours, and the arguments here are therefore based on my interpretation. Unfortunately, the resolution in Google Earth for the area surrounding Rawda is too low to allow any satellite surveying as of March 2014.

There seems to be little doubt that the structures are of a similar nature, but the functional explanation for this archaeological feature varies. Due to their frequent occurrence in arid regions, they are commonly attributed to pastoralism and pastoralist activities, as such groups are more often associated with sub-optimal landscapes. Initially, the first function which springs to mind is therefore an association with husbandry, i.e. corrals or animal pens for various operations relating to that form of subsistence and economy, often supported by analogies and parallels taken from relatively recent herder populations (e.g. Castel et al. 2008, p. 44). Clearly, this can at the outset seem like the most probable function, but when the topographical context mentioned above is taken into consideration, many of the stone enclosures are rather oddly placed in the landscape to work efficiently as animal pens. **Figure 4.34** shows a collection of enclosures in Jebel Hawit er Rass (60), of which some are surely positioned too steeply and impractically to keep herds, e.g. right up under the mesa plateaus. Additionally, quite a lot of the stone enclosures have no apparent entrances, many are quite small (c. 5 m diameter), and the larger clusters (i.e. of a dozen or more compartments) can sometimes seem peculiarly constructed for such purposes. However, there are also undoubtedly examples of Palmyrene stone enclosures which can have clearly worked fine as corrals, lying on more or less level ground along wadi banks or on low rolling hillocks in the larger wadi-plains (**Figure 4.35** – also cf. **Figure 4.37**), suggesting that the actual explanation could be rather complex and the structures themselves multifunctional and multifaceted.


**Figure 4.35:** A number of stone enclosures in Wadi Sahil N (57), including a cluster situated on level ground on a low, gently undulating hillock, as well as a small enclosure on level ground on the wadi bank. The other two structures of similar type are placed on the slopes of the hillock. The former examples could indicate a function associated with husbandry, while the latter does seem more uncertain in this regard. Note also the four tumuli in the upper right corner, and a kite in the centre of the picture, completing the mobile pastoralist technocomplex within a tiny window on the landscape, like many of the figures in this subchapter.

Slightly more controversial is the suggestion presented by Bradbury (2011, pp. 284-286) that these enclosures in fact may be remains of temporary habitations, constructed by a shifting population following resource availabilities, where the clusters could present family units. She proposed that roofing could have been provided by perishable materials for the smaller compartments, as there is no evidence for this remaining. The clustering is explained as either intentional, constructed over a short time-span, or as multiple phases, where extensions were added on with time. She argued further that they represent the upland transhumance habitation of a single settlement system in combination with lowland agro-pastoral settlements in the region, due to similarities in archaeological assemblages recovered from them. Although my knowledge of the material from the Homs NSA is highly deficient compared to Bradbury, this explanation seems initially improbable for the majority of stone enclosures recorded in the Palmyrene, again mainly based on their topographical context. However, it is clearly not inconceivable that some of the structures may be remains of temporary habitation, and that multifaceted functionality should be the general perspective. Bradbury did base this explanation on the research carried out at the site of Umbashi in the Hawran region of southern Syria by Braemer et al. (2004) (also cf. **Figure 2.16** and **Figure 2.17**). They recorded around 200 structures similar in construction to such irregular stone enclosures, with clustering of cells from five to thirteen units. The organisation showed no particular pattern relating to hierarchy or central space, and they were situated mainly around the margins of the site. There were indications of doorways or windows, and roofing constructed by slabs and supporting pillars, but these doors were tiny, and there seemed to be a general pattern of limited access, even some without apparent entrance. These types of structures were dated by pottery from sondages to EBA IV, as well as showing evidence for later reuse (Braemer et al. 2004, pp. 124-127; also cf. Bradbury 2011, p. 349), as has been shown repeatedly to be a recurring feature for the structures incorporated into the mobile pastoralist technocomplex. The notion that access was limited and the cells could easily be sealed off can indicate that the structures were used for storage by a mobile population in periods of absence (Bradbury 2011, p. 350). Bradbury (2011, p. 286) argued that a use of some enclosures for animal shelters is also highly probable, as in her distribution pattern of these enclosures proximity to small seasonal pools or lakes, as well as an association with so-called *damp ground* (Bradbury 2011, pp. 267-269, fig. 6.26), suggests watering for herds. However, she also pointed out that the irregular clustered enclosures in the Homs NSA are usually situated some distance from the wadis that can be associated with agriculture, probably to keep animals away from crops (Bradbury 2011, p. 287), apparently a rather different pattern than the one in the Palmyrene. Interestingly, Braemer et al. (2004) also recorded in detail a structure type they called encampments, specifically relating them to pastoral-nomadic herders. The general layout of this structure looks like many of the ones in the Palmyrene as well as seemingly similar to those presented by Bradbury (2011), with some circular to elliptical enclosed cells and some isolated curved wall-lines (cf. Braemer et al. 2004, p. 263, fig. 499). These enclosures are described as irregular cells of three to five meters, both fully enclosed and some with openings. The composition of isolated curves, open cells and enclosed spaces for several Palmyrene examples have by and large been seen as merely a result of preservation, but the structures from Umbashi show that while it is not possible to confirm the condition or preservation status, clearly such a composition can be the actual structure and not a result of degradation over time. However, the volcanic landscape around Umbashi (cf. **Figure 2.17**) shows much better preservation than the Palmyrene in general, probably both due to local construction material and lower population densities through time (Helms & Betts 1987, pp. 41-42). One stone enclosure there also had wedge-stones and stone bases which presumably should be associated with a tent-like superstructure supported by poles, and one of the open cells had a hearth, thus evidence for occupation vs. the structure being animal pens or gardens. However, this stone enclosure was situated on more or less even ground, as opposed to many of the Palmyrene examples. On the other hand, it was located on a rocky ridge next to a *fayda* collecting rainwater from a relatively large area and silting up right next to the enclosure. This system is still working today and suggests that there existed similar conditions at the time of the occupation, but the structural arrangement of this construction the researchers emphasise is in no way similar to that employed for modern or historic nomadic camps. This was supported by the archaeological surface assemblage, which consisted of undatable lithic material and pottery dated to the EBA IV (cf. Braemer et al. 2004, p. 263). Again, this seems to underline the importance of an approach focusing on multifaceted functionality for these structures, with both clear comparative archaeological suggestions for husbandry and occupation, as well as associations with water run-off and silt deposition.

Quite opposite to this explanation – that is, a non-agricultural one – is the notion that circular stone enclosures could be the remains of threshing floors, as has been proposed by Avner et al. (2003, pp. 455-456) with reference to similar structures found in Israel. The hypothesis is that cereals have been threshed inside the enclosures, where the low walls prevent the constant wind usually prevailing in the steppe from catching the straws, but the same wind is subsequently employed to separate the chaff from the grains by throwing them both in the air, where the light weight of the former part is blown away, while the heavier cereal grains to fall down to the ground. Cereal cultivation is known from later times to have been carried out in the small- to medium-sized wadis in the Palmyrene with a variant of this practice incorporated (Meyer, personal communication), which can go some way of explaining why many stone enclosures are located along the banks of these. Once more, this function cannot be ruled out and could be included in a multifaceted aspect of the stone enclosures.


**Figure 4.36:** Image from the northern part of Jebel Labidah (61) showing a kite, two tumuli and several stone enclosures recorded in Google Earth, where one of the latter structures is situated on sloping ground, and actually having collected a pool of turquoise water (cf. left side). Most of the other enclosures are lying in relative isolation on the lesser wadi banks, but one cluster on the bank of the wadi conflux (right side) looks somewhat like a smaller version of the example presented by Braemer et al. (2004, p. 263).

In fact, some form of horticulture could explain the *modus operandi* behind many of the stone enclosures in the Palmyrene, particularly when taking into account their topographical context. **Figure 4.36** shows how a stone enclosure in Jebel Labidah (61) lying on sloping ground has collected water from rainfall seeping down from a small mesa plateau toward a wadi. Not only can such a construction temporarily halt and gather water on its way down a slope toward a wadi, but it could also collect soil, which could be used to grow small gardens of crops (cf. Meyer 2009, p. 129). A similar explanation was also provided as an alternative by Castel et al. (2008, p. 39), parallel with their function as corrals, and thus potentially as multifunctional structures. In sub-optimal regions, structural investment in the landscape in terms of labour, technological developments, or external sociopolitical factors could improve its resource potential considerably and lead to realisation of human exploitation and habitation, and is indeed integral to the definition of such zones (cf. Bradbury 2011, p. 44).

**Figure 4.37:** Two larger stone enclosures found in the foothills of Jebel Merah. The function of these particular examples is uncertain, but they represent both examples of structure lying on flat (left) and sloping (right) ground, and thus can indicate multifaceted functionality, e.g. as both pens and gardens respectively (Photo: Torbjørn Preus Schou, 2011).

The chronological context of such stone enclosures is difficult to ascertain. However, it seems quite clear that the structure type and many of the examples have been in use since the EBA, and possibly the Chalcolithic. On the other hand, many are clearly built *after* the erection of tumuli in the Palmyrene, something which can be deduced by the frequent reuse of construction material listed in appendix 1 (as *Encl.*), and many are overlying and therefore postdating Roman/Byzantine structures (e.g. Meyer 2011, p. 70). Perhaps this is not surprising, considering the potential multifunctional aspect of this structure type, as well as the probable continuity in general landscape use until modern times. Castel et al. (2008, p. 39) observed that their difference in preservation status suggests that they were *not* constructed at the same time, supporting the presumed chronological variation. They have collected sub-surface dust samples from the inside and outside of a number of these stone enclosures, which suggested some sort of pastoral function. Comparisons of the combination of siliceous algae in the sediments with those of the EBA IV site of Rawda indicated furthermore a synchronous use of one of the enclosures with the settlement, although they pointed out that others in this area could be of a very different date (Castel et al. 2008, p. 44). The archaeologists working in the Homs NSA collected material datable to the Chalcolithic or EBA in most of their enclosures, although they also found later material characterised as low-level *background noise*, thus leading them to argue that these primarily date to the $4^{th}$-$3^{rd}$ millennia BCE (Bradbury and Philip 2010, p. 145; Bradbury 2011, p. 274). The few examples of stone enclosures recorded during the Palmyrena ground survey which contained archaeological surface scatter yielded only Roman/Byzantine or later material, although it should be emphasised that all those investigated were located in close proximity to Roman/Byzantine sites, around which pottery sherds of such a date are ubiquitous. Thus, a provisional conclusion would have to be that stone enclosures in the Palmyrene are similarly constructed, within a narrow horizon of variation, but are multifaceted and probably have a wide chronological distribution, filling a number of potential functions based on comparative research and topographical contexts. This may also suggest some form of continuity of exploitation and probably habitation in the region. Of course, there is the possibility that there is a ritual function associated with the Palmyrene stone enclosures, which would be very difficult to ascertain. However, in my view it is anachronistic to separate Bronze Age landscapes and societies into clear *ritual/sacred* vs. *functional/secular* spheres, as this division is probably artificial, not being part of the ancient mind-set, and generally a consequence of modern thought and philosophy.

### 4.5.5 The Google Earth survey and distribution of Palmyrene kites

All in all, 426 kites have been documented via Google Earth in the Palmyrene, including a small number located southwest of Palmyra in Jebel Haiyane, which all have until very recently remained unrecorded by archaeologists as the area was unsurveyed (cf. Helms & Betts 1987, p. 46). However, during 2012 Kennedy recorded 121 kites in the same region by applying the same methods as those used here, albeit carried out independently (cf. Kennedy 2012). Most of these structures probably overlap with those presented here, but his study focused more on the arid steppe east of Palmyra than the present work, where he documented a small group which probably is novel. This means that at the very least over 300 examples can be characterised as new discoveries in the Google Earth survey presented here. In addition, a further seven kites have been found lying in the northern foothills of Jebel Merah, two of which were already known from the 2008 prospection, and the remaining kites have been recorded in the satellite imagery study (cf. 4.3.2.3). Only one kite, located in the southern Jebel Merah foothills, was surveyed on the ground during the 2011 campaign (fig. 4.39), and was subsequently shown by satellite studies to be only one of *three* such structures located in the entire surveyed part of the concession area, i.e. the Jebel Abyad region and the southern half of the Jebel Merah region. Evidently, there is a selective pattern in the distribution of kites in the Palmyrene (**Figure 4.38**).

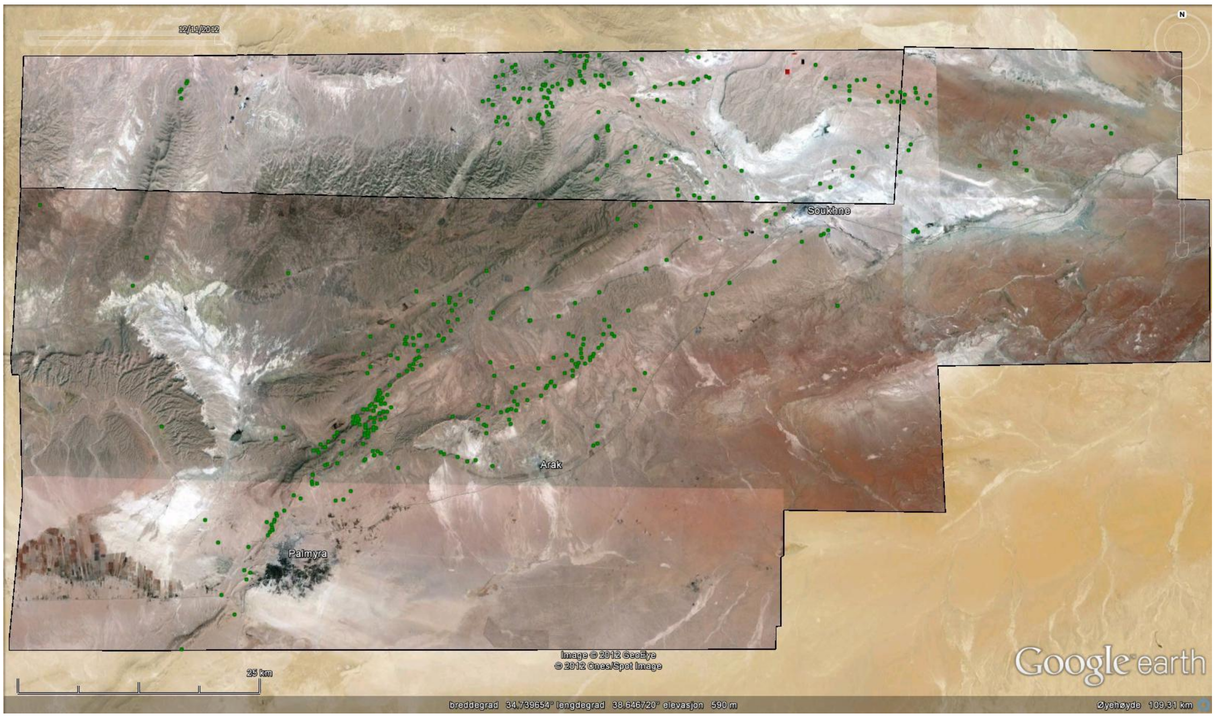



**Figure 4.38:** Distribution map of kites surveyed in the Palmyrene via Google Earth and in the commercially available satellite imagery. In addition, the group of seven kites located in northern Jebel Merah is also shown. Evidently, there is a geographical determinant associated with this type of structures, as the eastern, but particularly western quarters of the region contain close to none.

#### *4.5.5.1 Distributional patterns of Palmyrene kites*

For the surveyed region as a whole, three areas stand clearly out as focus of kite construction and activity (**Figure 4.38**). The first one is the mountain range stretching northeastward from Palmyra, and include the landscape areas containing the extended northern end of Jebel Haiyane (16) and northeastern third of Jebel Safra (21), but mainly Jebel Mohamed ibn Ali (23) which alone contains 89 examples – a fifth of the total number. This is by far the most densely packed area, with several kites criss-crossing each other, and thus arguably not having been in use at the same time. The chronological difference need not be more than different seasons in a single year, but due to the practical use of kites as described by travellers (see below), it seems likely that a certain amount of time passed between them – otherwise they would probably hamper the animal drives (cf. **Figure 4.39**, nos. 3-4 – cf. **Figure 4.44** for a close-up view). Another concentration of kites is located in the parallel range to the first one, along the south side of the wadi-valley toward Suhne, and includes structures in the elevated parts of Kheurbet el Qbeibe (35), the Wadi Qseibe/Dahr el Mosri border zone (34/36) and southwestern part of Jebel Qleilate (38). The last main group lies in Jebel Labidah (61), once more standing out as an area of high activity, and across the gap in the wadi-plain south of this range and into the foothills of Jebel Hawit er Rass (60). Jebel Labidah has 53 identified kites, which is the second largest proportion of the total, apart from Jebel Mohamed ibn Ali mentioned above (cf. appendix 3 and 4). The remainder of Palmyrene kites is scattered between these three areas, although the majority are found in the plains around and northwest of Suhne, in addition to two smaller clusters in the central and eastern Jebel Dahek (48-49 and 55), some of which are seen in **Figure 4.39**. In fact, the Wadi Sahil valley system (areas 44-45 and 56-58), which presumably is the topographically determined route leading northward through Taibe and El Kowm to the northern plains contains a fair number of the Palmyrene kites. This has probably to do with gazelle migrations and topographically funnelling terrain, an aspect which will be explored further below.


**Figure 4.39:** Google Earth view of a cluster of kites in central Jebel Dahek (55), as well as the tumuli and stone enclosures surrounding them, all of which follow the general distributive pattern explained above. The kites all conform more or less to the general plan of this structure type, albeit slightly different. For instance, no. 6 is of the *sock type* recently defined by Kennedy (2012), while no. 2 has been eroded away or removed, with only its fences remaining. Interestingly, the majority has entrance opening toward the southeastern quadrant of the compass, suggesting that most animal drives probably occurred in a general northwesterly direction. Nos. 3 and

4 also show the criss-crossing aspect, both evidently not in use at the same time – and probably not same season, as no. 4 would hinder no. 3.

It is not merely the positive results that are interesting, but also the negative ones, so to speak. Whereas the central part of the Palmyrene is littered with kites, other areas are lacking to the point of being devoid of this structure type. Of course, the northern areas west of Jebel Labidah and the arid regions south of a Palmyra-Suhne line must be taken out of the equation, as they have not been surveyed in this respect. However, the large northwestern region defined by a conceptual diagonal line lying north of Jebel Haiyane (14) and the concentration in and around Mohamed ibn Ali (23) described above, stretching north all the way through Wadi Qutqut, are as good as empty of kites. In fact, in this extensive part of the Palmyrene, only ten kites have been recorded by the ground survey, satellite survey and Google Earth survey – one in Jebel Shaar (1), two in southern Jebel Merah (3) as mentioned (cf. fig. 4.38), one in Jebel Abyad E (7), two in Jebel Marbat el Hassane (16), two in Jebel Tar en Nuwaysir (15), one in Jebel Abu Rujmein (19) and one in Jebel Rass Aaqabet (28). Additionally, preliminary scans of the wadi-plains west of Jebel Labidah (61) and the gap just south of this range linking the plains with Wadi Sahil N (57) also suggest that very few kites, or even none at all, were constructed there – i.e. a complete drop-off of such structures from the densely packed landscapes just east of the gap. This is striking, and indicates that there is a deliberate system to this practice, presumably subject to allocation and availability of resources. The ten northwestern kites could actually be labelled expected distributive anomalies in such a large data set, while the ones in central-eastern Palmyrene are conforming to the rule. On the other hand, they do not seem to vary any differently in morphology compared with the rest.

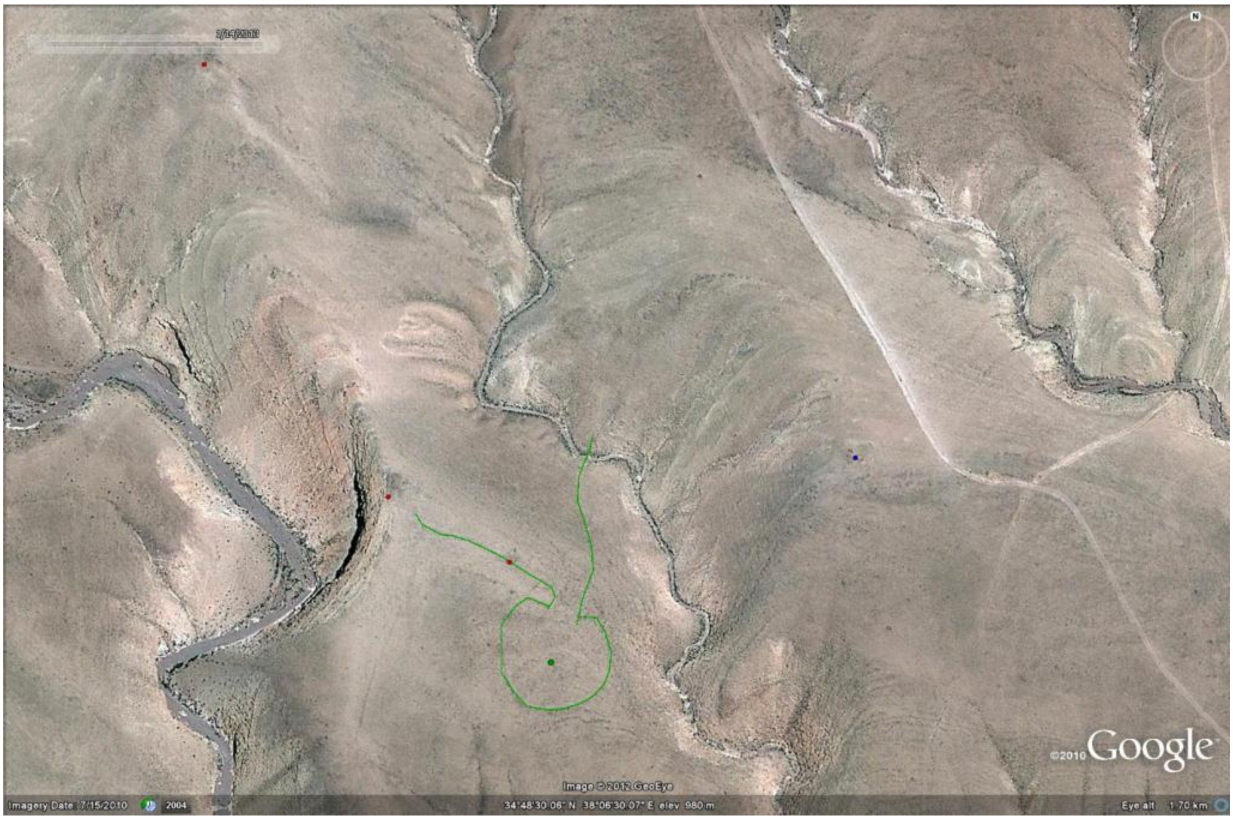



**Figure 4.40:** The only kite investigated on the ground is located in the southern foothills of Jebel Merah, with fences leading southward from a minor wadi and up a slope, and the enclosure lies just on the other side of a ridge. The two tumuli nos. 343 and 345 lay on its western fence line, thus seemingly postdating it, although theoretically they could have existed at the same time.

### *4.5.5.2 Interpretations of kites and their local and regional functionality*

The similarities in general morphology are probably a consequence of common function, rather than being due to chronology (cf. Helms & Betts 1987, p. 49). There was some debate in the late 1990s about whether or not the kites should be attributed to domestication of wild ungulates in the Near East, and they in this regard were installations for gathering domesticated or semi-domesticated animals, or if they were used for catching wild animals, predominantly gazelles, but potentially also onager, oryx and ostriches – i.e. historically attested regional fauna living and moving in herds (cf. Mendelssohn 1974; Echallier & Braemer 1995; Rosen & Perevolotsky 1998; Moore et al. 2000, p. 443 – cf. 2.7.6). Travellers' accounts from the $17^{th}$ until the early $20^{th}$ century CE mention structures which clearly are kites as being used by villagers (*fellahin*) during the Ottoman period to capture gazelles (e.g. Musil 1928, pp. 3-4; Burckhardt 1967, pp. 220-221). The other species living in herds were probably already rare by the $18^{th}$ century CE, and not economically viable to capture through the use of kites, but a mural in Jordan from 8th century CE is said to show a kite being used to catch onager (Moore et al. 2000, p. 445). Musil described an area east-southeast of modern Dumayr in these words:

*"On all the hills we noticed heaps of stones (rğûm), apparently the debris of old watchtowers[17]. Conspicuous in the lowland were numerous enclosures, fenced around by rough stone walls. Many of these measured several hundred meters in circumference, and the walls were up to two meters in height"* (Musil 1928, p. 3).

He mentioned that the structures were called *mesâjîd*, and how the walls extend hundreds of meters beyond the enclosure, widening out as well as becoming lower and lower. If a herd came near the low walls, they cautiously drove the gazelles into the widest opening, and then startled them from behind, after which they would panic and bolt in the direction of the enclosure. When caught, the entrance was closed and the animals killed off by throwing rocks and missiles, or by falling into pits which lay outside deliberately lowered parts of the enclosure wall, in this manner killing 50-60 gazelles in half a day (Musil 1928, pp. 3-4). The Arabian name of these structures is very similar, and probably identical to that informed by Burckhardt (1967, pp. 220-221) to be *masiade,* according to his information principally found region of Qaryatein, Hassie, and Homs, and thus possibly kites presently or previously found in the Palmyra and Qalamoun ranges (cf. Kennedy 2012, p. 148, fig. 6) and areas slightly further west-northwest (cf. Echallier & Braemer 1995, p. 42, fig. 9), now covered by modern development and agriculture. Indeed, the Arabic root these words are based upon has associations with hunting (Helms & Betts 1987, p. 62), as does presumably Abu Masyadah near Dhuweila from where kites are known (cf. Helms & Betts 1987, p. 50), as well as the landscape area Wadi Massadeh (4) located near the watershed between the Jebel Merah foothills and the mountain of Al Matna in the Palmyrene – although the latter does not contain any visible kites. Thus, despite the other hypotheses put forward (e.g. Echallier & Braemer 1995) it seems to be quite clear that these structures were mainly functioning as traps for wild animals (e.g. Moore et al. 2000; Holzer et al 2010; Kennedy 2012). However, Poidebard favoured a military explanation to the kites as defensive structures against eastern cavalery (Holzer et al. 2010, p. 807), despite actually being told by a local Bedouin that they were for

[17] Once again, this is probably a reference to tumuli in the area – an area now extensively developed, and thus showing no trace of these nor the kites on the Google Earth images. Also cf. **Figure 4.41** for *watchtowers* vs. tumuli. His term *rğûm* is doubtless a way of writing *rejem* or *rujm* (cf. note 12).

hunting and killing gazelles (Moore et al. 2000, p. 442), but not surprisingly, as his interpretation was based on the general perspective at the time regarding these constructions (cf. Helms & Betts 1987, p. 46). However, his map of so-called Roman constructions along the Palmyra-Suhne road provides us with the useful confirmation that the *watchtowers* and *fortifications* described by himself, and probably also those *ruins of watchtowers* mentioned by Musil (1928) and other early travellers in fact are what archaeologists today categorise as tumuli and kites, clearly shown in **Figure 4.41**, where a close-up map from Poidebard (1934) is compared with the probably exact same spot in Google Earth. Although the kite itself has been destroyed by modern development, both the fortlet and the tumuli remain conspicious.


**Figure 4.41:** Google Earth view showing some of the so-called Roman constructions emphasised by Poidebard (1934). The inlaid drawing is his presentation of the escarpment gap shown in the centre of the picture. The Roman post seems genuine enough, but his *watchtowers* are evidently tumuli. The *ouvrage de défense indigene* is clearly a kite (cf. **Figure 4.42**), although it seems to have been destroyed at some point during the 85 years that have passed.

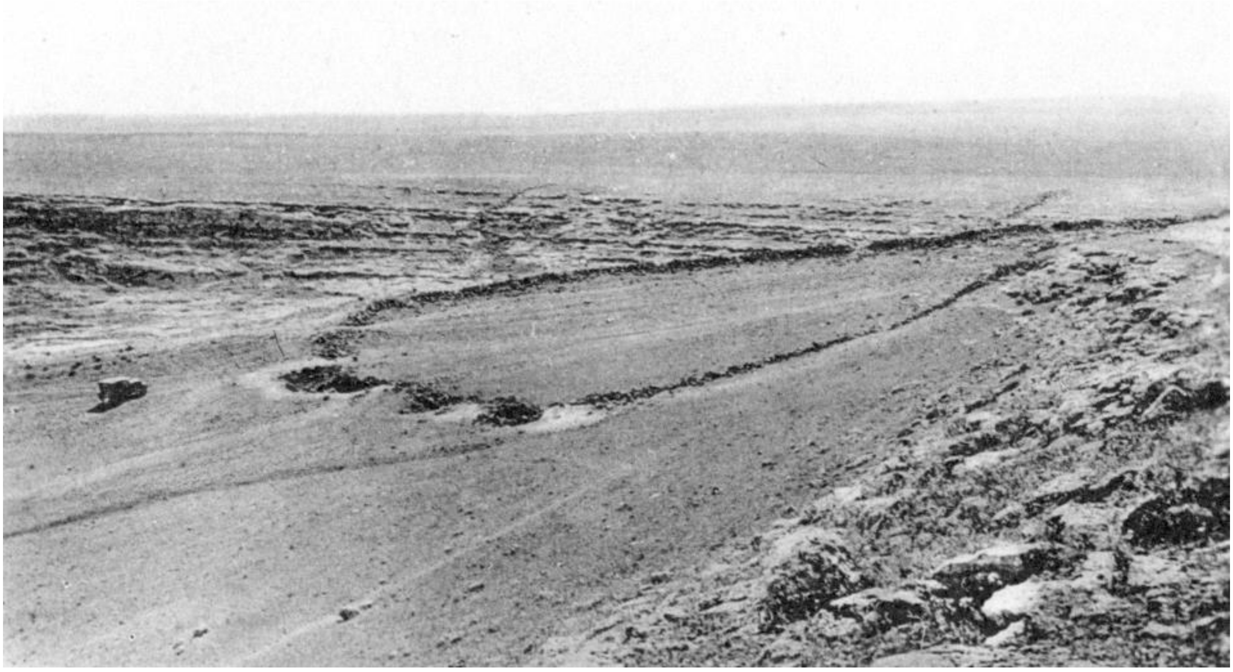


**Figure 4.42:** Photo of a kite taken from Poidebard (1934), presumably the one shown on the inlay in **Figure 4.41**, based on its morphology and topography, and therefore one that has now disappeared.

The most interesting result from the analysis conducted on the Palmyrene kite material, relates to the direction of their entrances. There is a striking pattern in the data set, which incidentally seems to conform to investigation carried out by other researchers, for the majority of them to open up southeastward. Echallier and Braemer (1995, p. 53) noted that the direction to which the entrance of the guiding fences open up is not arbitrary, but grouped into two main clusters – the largest one toward east-southeast, and a somewhat smaller group toward west-northwest. Their investigation concerned a small group (n=21) of kites in central Syria and a larger one in southern Syria (n=153). The south Syrian kites varied somewhat, with some areas associated with a southeasterly orientation (near Safa) and others with a northesternly one (Wadi Sham and Wadi Gharaz). However, the researchers could not come up with an explanation for this, finding it difficult to envisage uniformity in e.g. seasonal wind patterns or animal migration cycles which could conform to these orientation patterns. The latter of these explanations now seems to be prevailing in Near Eastern archaeology as the explanation for the kite systems (see below). Interestingly, the central Syrian group in their material also alternated, but featured a majority of northwesterly oriented entrances. This group was situated in the hills and plains west of Qaryatein, and hence some distance away from the Palmyrene, and as it is my view, supported by the work of other researchers working in the region (cf. Bonacossi & Iamoni 2012, pp. 36-37), that kites and wild animal migration patterns are closely associated, these structures probably relate to a different migration route than the Palmyrene kites in this study – i.e. a different gazelle population (cf. Akkermans & Schwartz 2003, p. 37; Bonacossi & Iamoni. 2012, pp. 38-39). Kennedy (2012, p. 153) discovered also that nearly all the funnels connected with sock kites he recorded had an opening toward the east-southeast and southeast, but as mentioned his material no doubt overlaps with that presented here. Bonacossi and Iamoni (2012, pp. 41-42), who investigated a group of kites in Jebel Haiyane and Jebel al-Khan in the Palmyra range southwest of Palmyra itself, found that entrances there were directed mainly toward the south (37 %), east and southeast (29 %), but also northward (28 %). Joining up the two former groups to form a southeastern quadrant of the compass gave a portion of two-thirds of the total number of kites opening *toward the steppe plain*, so to speak, and the remaining third mostly toward the north.

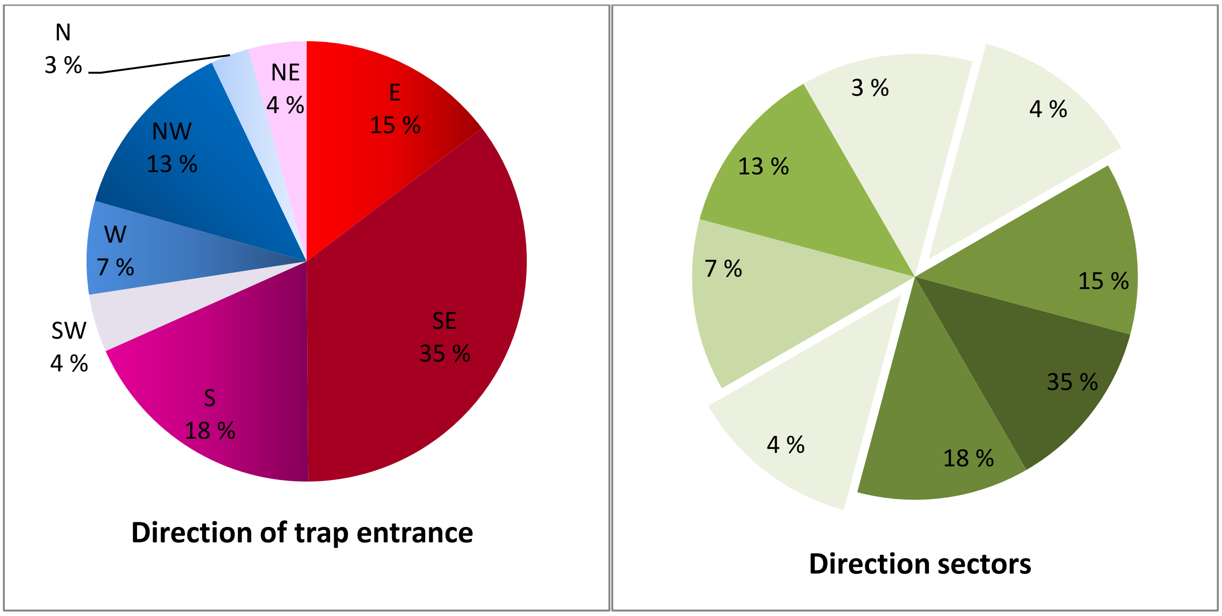



**Figure 4.43:** Diagrams of the directions associated with the 426 recorded Palmyrene kites. The left hand figure, although loosely based on a graphical abstraction of the compass, shows the directions of which the kite entrances open up as parts of the total number, the latter represented by the whole figure. The right hand figure shows these proportions of equal sizes and percentages indicating their part of the total, while each part merely represents the various compass directions. The main point here is that over two-thirds of the kites have entrances toward the southeasterly quadrant, while at the most only 25 % open toward the northwesterly one.

This pattern is also very common for the Palmyrene kites. **Figure 4.43** shows the direction of entrances for all the 426 examples, both as parts of the total (left) and as equal sectors indicating directions on the compass (right). The majority of fence entrances are directed toward the southeast (35 %), with the two next on the list being south (18 %) and east (15 %).

Incidentally, for the two latter directions there is by far a prevailing tendency for the entrance to be opening south-southeastward or east-southeastward respectively, rather than purely toward the south, south-southwest or east-northeast, thus very much suggesting that the southeastern quadrant of the conceptual compass is where the focus lay when these were constructed. There is also a smaller group with the entrance toward the northwest (13 %), while the other directions are of almost negligible proportions, and sometimes probably even attributable to adaptations to the immediate topography associated with each kite. Thus, just like the Syrian-Italian team found to be the case for the Palmyra/Qalamoun ranges southwest of Palmyra, *over* two-thirds of the kites were constructed with animal herds approaching from the southeasterly direction in mind, i.e. the arid Al-Hamad steppe plain stretching southward from Palmyra toward Jordan (cf. **Figure 2.1** and Musil 1928, p. 2, map). However, unlike the case was in their research (cf. Bonacossi & Iamoni 2012, p. 41), an even smaller portion, merely just over an eighth of the total have entrances directed northwestward, although the percentage increases to c. 20 % if the entire northern quadrant is incorporated (cf. **Figure 4.43** - right).


**Figure 4.44:** Google Earth view showing two kites in central Jebel Dahek with entrances toward the southeast. These are actually close-ups of nos. 3-4 (left) and no. 6 (right) on **Figure 4.39**, the latter being of the sock type. However, no. 4 on the left figure seems to open northward.

The persian gazelle (*Gazella subgutturosa*) is a migratory species of herd animal which tentatively fits rather well with kites focusing on a specific direction, as it is found in different places in the steppe at various times of the year, although there have in earlier times probably also been other species which could have been hunted with kites. Akkermans and Schwartz (2003, p. 35) suggested, based on early 20$^{th}$ century CE observations near Damascus and Amman, that gazelle herds reached their maximum size in autumn near the end of the dry season, and migrated from north to south during this time of the year, and returned subsequently north in the course of the wet season. There are supposedly two main routes which have commonly been used by the gazelles, one on the western edge of the steppe past Damascus and Qaryatein, and one in the east, through Al-Hamad, past Suhne and continuing through the Palmyrene between the Jebel Abu Rujmein massive and Jebel Bishri, toward the middle Euphrates area and the northern plains (cf. Akkermans & Schwartz 2003, pp. 35-37, fig. 2.13) – i.e. through the Wadi Sahil (56-58) and Jebel Dahek (48-49 and 55) areas mentioned above. Clearly the large concentrations plotted by the Google Earth survey in this very region must be seen in association with the migratory pattern of these gazelle herds. This can also explain why there are so few kites found in the landscape areas behind the virutal wall of kites stretching from Jebel Haiyane (14), through Jebel Mohamed ibn Ali (23) and northern Jebel Safra (28) and up to the northern plain, including Jebel Labidah (61), via Jebel Taniyet es Safra (59) (cf. **Figure 4.38**, appendix 3, and appendix 4). Herds would have been funneled by the topography created by the sheer cliffs on the western edge of Jebel Dahek to migrate through Wadi Sahil (57) and Tulul al Bayda (56) toward Taibe, where they could easily be captured by the use of kites. Those migrating further east of Suhne would have moved through central Jebel Dahek (48-49 and 55), where the smaller, eastern group of kites mentioned above could have served as the local hunting installations. However, the main part of this migration was not experienced by the central-western parts of the Palmyrene – i.e. the Jebel Abyad region, the Jebel Merah region, and the Jebel Abu Rujmein massive – and presumably therefore contain very few examples of this structure type.

There are many indications that hunts in this region were concentrated in the weeks of April and May (Akkermans & Schwartz 2003, p. 36). Bonacossi and Iamoni (2012, p. 42) argued based on the entrance directions that they were mainly conducted during the humid season as the gazelles migrated northward through the arid steppe toward northern Syria. However, in their material some hunting would presumably also have been carried out as the gazelles returned southward in the autumn, since over a quarter of their kites have entrances directed northward. Drummond saw in 1754 great numbers in early July near Sfira at the northern end of Sabkhat al Jabbul, southeast of Aleppo, suggesting that the herds reached the northern plain sometime in June (Moore et al. 2000, p. 446, with references), while Lady Anne Blunt travelling in the 19th century told of many thousands of gazelles packed together migrating northward in early summer (Blunt 1879a, pp. 344-345). Secondary evidence also place large annual gazelle herds in the Palmyrene from April toward July. The *Sleyb*[18], described by 17th to 19th century CE travellers as being expert gazelle hunters and living among the Bedouins, but not being part of the Bedouin society, have been noted to migrate north-south *following* the movement of the herds (cf. Blunt 1879b, pp. 110, 193-194; Burckhardt 1967, pp. 14-15). They are by these accounts invariably found in the Palmyrene in spring and summer, suggesting that the gazelles were present in the region at this time of the year (Moore et al. 2000, p. 447). The zoologist Aharoni travelling in the region in 1915 observed the migration of gazelles, where he recorded an estimate of over ten thousand animals returning from north to south, in separate herds of thousands. He mentioned that the Bedouins hunt them during this migration, applying kites and trapping 500-600 gazelles at one time (Mendelssohn 1974, p. 726). However, it is unclear where Aharoni witnessed this, as Mendelssohn (1974, p. 726) says that the toponym *Rachiemeh* lie in East Jordan, while Moore et al. (2000, p. 446), informed by Z. Meshel, argued that the name is connected with Wadi Rcheme near El Kowm north of Taibe, where there is a concentration of kites[19]. In any case the activity probably took place in the autumn, when the herds were returning south. Tooth wear at Abu Hureyra in the steppe south of Lake Assad, suggests that gazelles were not caught in the later summer or the early autumn migration southward, because the herds probably were more dispersed, making mass drives impossible to carry out, but rather as they congregated when closing in on the mountain gaps between the Palmyrene and Jebel Bishri, coalescing into large herds due to the topographic funneling (Moore et al. 2000, p. 446). This fits very well with herds of thousands coming together in the region of Taibe, just before entering the Palmyrene. However, given the predominance of southeasterly oriented kites, the herds were possibly even larger during the northward migration, although they give birth in the spring time (Bonacossi & Iamoni 2012, p. 43). Hunting with kites would not significantly affect the numbers, and would not result in extinctions as the method would turn uneconomic and presumably abandoned when herds became too small. The modern rifle is responsible for such consequenses for all the regional fauna (Mendelssohn 1974, p. 728; Moore et al. 2000, p. 449), emphasised by the modern situation where only about fifteen gazelles survive in the wild in the Jazal area, from relatively large herds in the Palmyrene up until the 1950s, although ostriches became extinct

[18] They have also been called Solubah/Selebee/El Szoleyb/Sleb (Moore et al. 2000, p. 447), and possibly been identified in Middle- and Neo-Assyrian sources as *Šelappayu* (Postgate 1987, pp. 268-269).

[19] Unfortunately, this part of the Palmyrene lies beyond the current (as of 2014) area with high-resolution Google Earth images.

in the 1930s (Bonacossi & Iamoni 2012, p. 43, note 46). Conclusively, it would seem that late winter through spring would have been the main season of which activity was at its highest in the Palmyrene, as the winter torrents waned, giving way to a relatively lush arid steppe, for both human populations and wild animals (cf. Wirth 1971, pp. 120-121). If, as has been suggested above, the stone enclosures at least partly had a horticultural function as well as the other potential functions, these garden plots would probably have been well sprouting in spring and into summer. Also today, the modern Bedouins following the now rather degraded grazing opportunities are present in the Palmyrene in spring time, i.e. from April until June, as we experienced their hospitality during e.g. our survey in 2011.

#### *4.5.5.3 Kites and chronological considerations*

Chronologically, the kites should probably be grouped in with stone enclosures, as structures associated with continuity over millennia due to their functionality. Clearly, they were at least used up until the First World War (cf. 4.5.5.2), and were probably in use continuously from the earliest travel accounts in the 17th century CE until the 20th century, judging from their mention in a chronological scatter of stories during this period. This suggests also that they probably are even older. Aharoni asked in 1915 local Bedouins about the kites, possibly in the Taibe area, when these structures were erected, and received the same answer every time:

*"In old times. The fathers of the fathers of our fathers already found them"* (Mendelssohn 1974, p. 726, with references).

As mentioned, the general morphology is similar for all the kites due to functionality, but there are specific features and forms that vary somewhat, mainly the shape of the enclosure trap. Echallier and Braemer (1995) created a typological classification based on this and on earlier work by Helms and Betts (1987), with five general shapes (star, triangular, circular, trapezoidal, and axe-shaped) and variations within these definitions. However, they found it difficult to establish chronology based on this typology, with aerial photographs usually not being able to decide due to the scale of documents, admitting that kite relationships could provide some information (Echallier & Braemer 1995, pp. 55-56). Kennedy (2012) expanded the typology by providing another called the *sock type,* but did not provide any new material on chronology of the kites. All the Palmyrene ones recorded in this study have been categorised according to these classifications (cf. appendix 3, pp. V-XIV). There does not seem to be any obvious functional advantage to any of the shapes, and they can therefore possibly have some chronological significance. In this regard, there is a slight tendency of star-shaped kites, which often also feature substantial archer's nooks or cover for hunters (cf. Mendelssohn 1974, p. 728), and partly also the trapezoidal ones, to have a clearer imprint in the landscape. This *could* be due to younger age, i.e. being in better condition as a consequence of not having been subjected to deterioration from the elements and deconstruction by human agency for thousands of years. In fact, kites with these archer's nooks generally seem to have this quality. However, this may equally well be due to the more solid construction provided by such fortification of the walls, so to speak. On the other hand, circular kites, and particularly those without these extra features, seem to have the vaguest imprint on the landscape, and could by the same argument thus be of greater age – e.g. like the one in **Figure 4.40**, even though its walls have been traced with lines. However, all this is tentative and has not been explored exhaustively, but it may provide potential for some chronological distinction between the kite forms, at least if combined with a study of relative chronology between them. Kites have been suggested to appear in the archaeological record as early as the 7$^{th}$ millennium BCE, something which clearly could be a possibility, although there is not too much evidence for this at the present time. However, kite use from the Chalcolithic and the EBA is on firmer ground, and seems to continue into the Iron Age and Roman period (cf. *Cairn of Hani* engraving) (Bonacossi & Iamoni 2012, pp. 43-44). Recently, the Syrian-Italian project working southwest of Palmyra (cf. **Figure 4.55**, area E) provided a *terminus ante quem* of the late 3$^{rd}$ millennium BCE for a kite in the Palmyra range, based on the fact that it structurally has incorporated several tumuli along its fences which they argue have to be of later date and were tentatively dated to the EBA IV (Bonacossi & Iamoni 2012, p. 44). This is also a recurring feature in the Palmyrene, with several examples of tumuli lying on top of various parts of a kite (**Figure 4.45** - also cf. **Figure 4.51**). Kites near the Umbashi site in the Hawran region in southern Syria have also been dated by relative chronology, as they are situated between so-called *jellyfish* structures of a probable Neolithic to early Chalcolithic date and buildings erected in the 2$^{nd}$ millennium BCE. This suggests again a focus of kite construction and use in the 3$^{rd}$ millennium BCE, even though the phenomenon probably stretched from the Chalcolithic period and into the MBA, with continuous or discontinuous use thereafter at least into the Iron Age (Echallier & Braemer 1995, pp. 54-55).

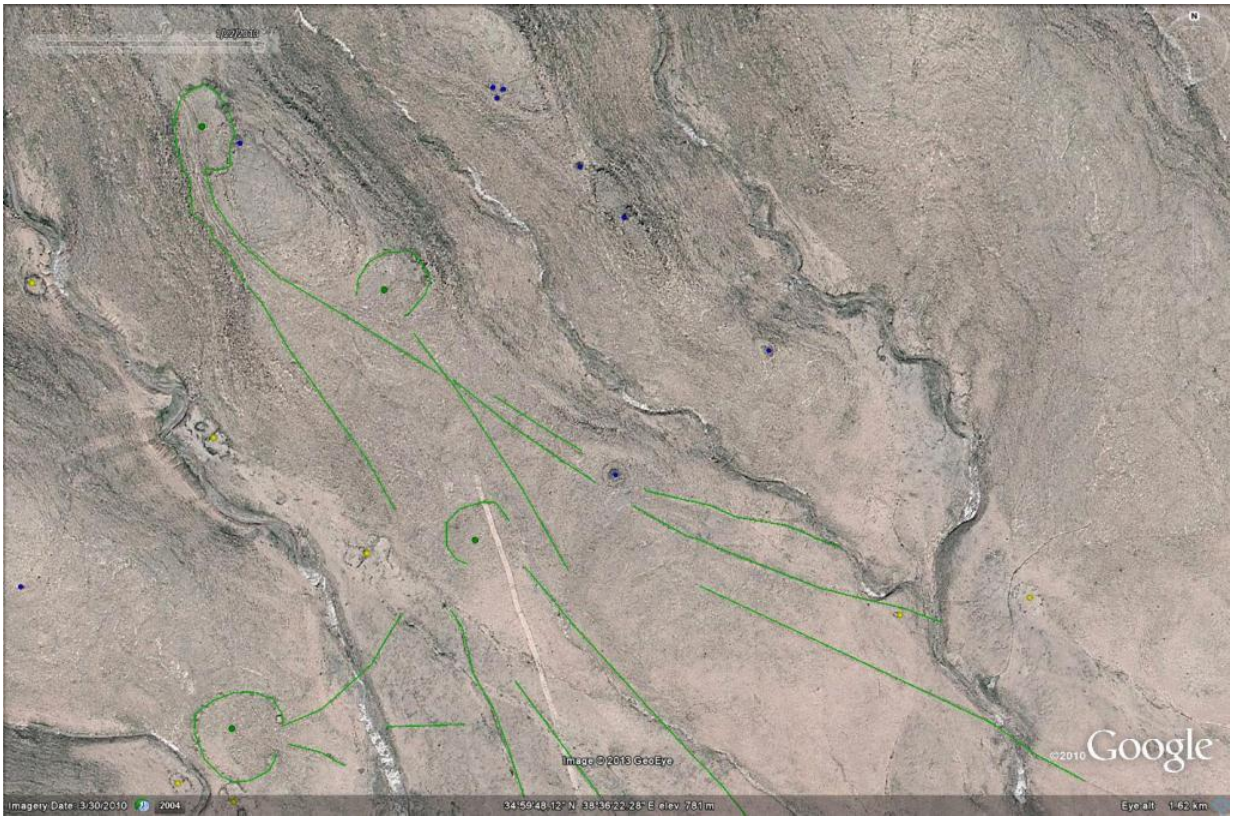



**Figure 4.45:** Google Earth view showing four kites located in the topographical transition between the Jebel Labidah range and the northern Wadi Sahil. At least two of them seem to predate a large cairn with a distinct foot chain, as this is situated on top of their guiding fences. There is also significant overlap between these structures, suggesting chronological difference for the kites themselves. Also cf. **Figure 4.51** for other examples of tumuli overlying kite structures in the Palmyrene.

While the examples above are associated with relative chronology, there has in fact very recently been carried out contextually sound radiometric dating on kites, although the structures in question lay in the Sinai-Negev region, and not in Syria. Holzer et al. (2010, pp. 811-813, tables 1-2) applied both $^{14}$C and IRSL (Infrared Stimulated Luminescence, cf. 4.6.2) and came up with consistent and synchronous absolute dates for the construction, use and abandonment of the investigated kites of the area. Similar to Umbashi, they seem to have been constructed in the first half of the 3$^{rd}$ millennium BCE, albeit possibly in the 4$^{th}$ millennium BCE, were in use until the 2$^{nd}$ millennium BCE, and went out of use by c. 1500 BCE – a period which prompted the researchers to term it *a short-lived phenomenon* there (Holzer et al. 2010, p. 813). However, only 17 examples of kites were at that point known from the Negev-Sinai (Holzer et al. 2010, p. 816), i.e. a very small group compared to the Syrian circumstances. Musil (1928, p. 4) mentioned that there were high piles of stone at the entrance of the enclosures he saw, which were visible from a great distance. Legge and Rowley-Conwy

(2000, p. 444) argued that it is likely these served as markers for the chasers toward which to drive the game, although this is not information that was shared by Musil. Tumuli situated in such a position *could* have been part of the kite, rather than being a burial monument, but this seems unlikely at least for the surveyed Palmyrene examples, particularly with regard to the form these structures have, with e.g. clear foot chains suggesting a funerary purpose (cf. **Figure 4.45** and **Figure 4.51**. Finally, the clear imprint of the kites in northern Jebel Haiyane could suggest that these are of a more recent date, as the expansion of Roman Palmyra probably would have destroyed structures lying so close to a large city. Additionally, as most of them lie just north of the city and actually have entrances opening up toward it, a gazelle chase not far from the city centre would be the only functional way of applying them – while conceivable, a seemingly unlikely scenario, considering the rather skittish disposition of these animals. Thus, these kites are tentatively from Ottoman times, when the town was of negligble size, or possibly surviving structures of pre-Hellenistic times, i.e. of a Chalcolithic or Bronze Age date (but cf. 4.5.1).

Conclusively, the EBA seems to have been the main period of construction and use for both kites and stone enclosures in Syria, albeit in this study this is mainly based on comparative material from various other archaeological research carried out in central-western and southern parts of the country, as well as in the Levant. However, these structures have clearly also been in use in later periods, at least from time to time, even into the 20th century CE with regard to some of the kites. Additionally, there are certain indications of even earlier origins, with convincing arguments for dates at least back into the Chalcolithic and through the MBA. Chronology for the Palmyrene tumuli have by and large not been touched upon here, apart from in certain cases of relative dating in associateion with other structures. In those cases they have been shown to be of later dates in relation to some kites, providing a *terminus post quem*, but for some stone enclosures shown to be earlier, thus establishing a relative *terminus ante quem*. However, in the few instances where an absolute date is possible to ascertain for Syrian arid landscapes tumuli, the period that emerge is EBA IV to MBA (cf. 4.7.3 – also cf. 4.1.5). I will now concentrate further on the chronology of the Palmyrene tumuli, as well as focus on the available comparative research.

## 4.6 Chronology and the dating of Palmyrene tumuli

### 4.6.1 The tumuli and surface collection of pottery

A relatively small number of pottery sherds were recovered in association with the tumuli during both the 2009 and 2011 ground survey seasons. However, this material should be considered as mainly tentative regarding absolute chronology, and all of it derives from secondary scatter on the ground surrounding the tumuli as well as occasionally from inside the structure or in the fill, but always from a clearly disturbed context. Thus, the pottery *could* have originated as grave goods and been discarded through the act of looting at some point in time, or it could merely have come from other forms of activities at the site, potentially a long time after the tumuli themselves were erected (cf. 4.1.5). Some material, both ceramic sherds and other small objects, like tobacco pipes, can be dated to the Islamic and Ottoman periods, but the majority of the pottery is of a probable Roman or Byzantine date (**Figure 4.47**). Assemblages from these two periods, sometimes indistinguishable, are by far the most common in the area, but this is not really surprising, given the number of Roman estates, villages, forts, fortlets and shrines which the Palmyrena project and other archaeologists have found lying in the landscape between Palmyra and Isriyeh (cf. Meyer 2008; 2009; 2011; also cf. Schlumberger 1951). Bonacossi and Iamoni (2012, p. 48) noted for instance that a few Roman potsherds from upper parts of a looted tumulus were intrusive, a situation which probably is paralleled in many of the Palmyrene tumuli sites, although it cannot be established with certainty. However, a few sherds of pottery provisionally dated to EBA IV have been recorded in the vicinity of several tumuli (**Figure 4.46**), while a somewhat larger amount of flint tools and flakes have also been found around them (**Figure 4.48**). The flint material *could* have originated in the graves, but as most of the material consists of flakes, it can just as likely be a result of activities connected to hunting or tool production in the proximity of the tumuli at some point in time. One Byblos point (cf. **Figure 4.48**, the southernmost point in the northern of the two clusters) was recovered near no. 199 (cf. appendix 1), but this site is on the other hand an excellent vantage point for a hunter looking down the Wadi Abyad or Wadi Massadeh – incidentally a name which itself suggests an association with hunting (cf. 4.5.5.2). In fact, the EBA IV pottery is essentially the most likely of these pre-Classical material types to be linked with the funerary function of these monuments, as alternatives for their presence is more difficult to envision, although their original context *within* the graves is still merely hypothetical.

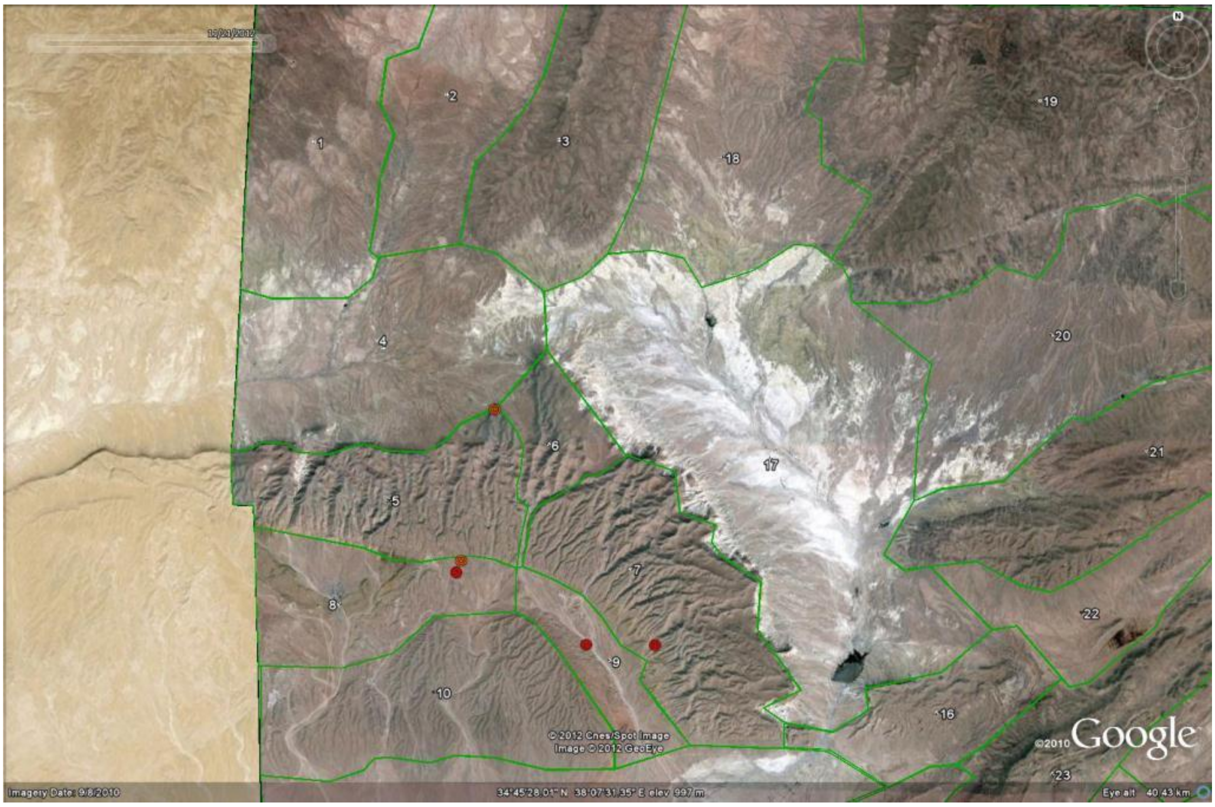



**Figure 4.46:** Map of tumuli sites where EBA IV pottery sherds have been recovered during the ground surveys.

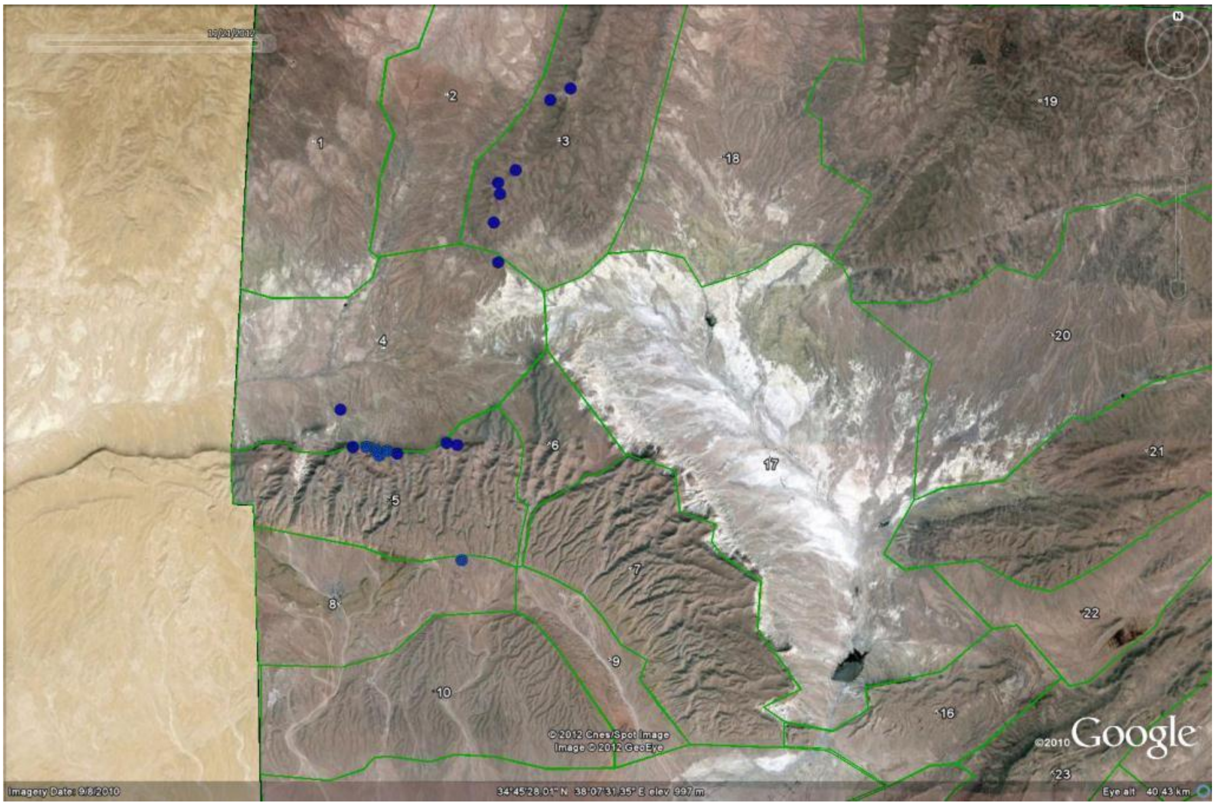



**Figure 4.47:** Map of tumuli sites where Roman or Byzantine pottery sherds have been recovered during the ground surveys. Clearly, the number of sites is quite a lot higher than is the case for the EBA IV pottery.

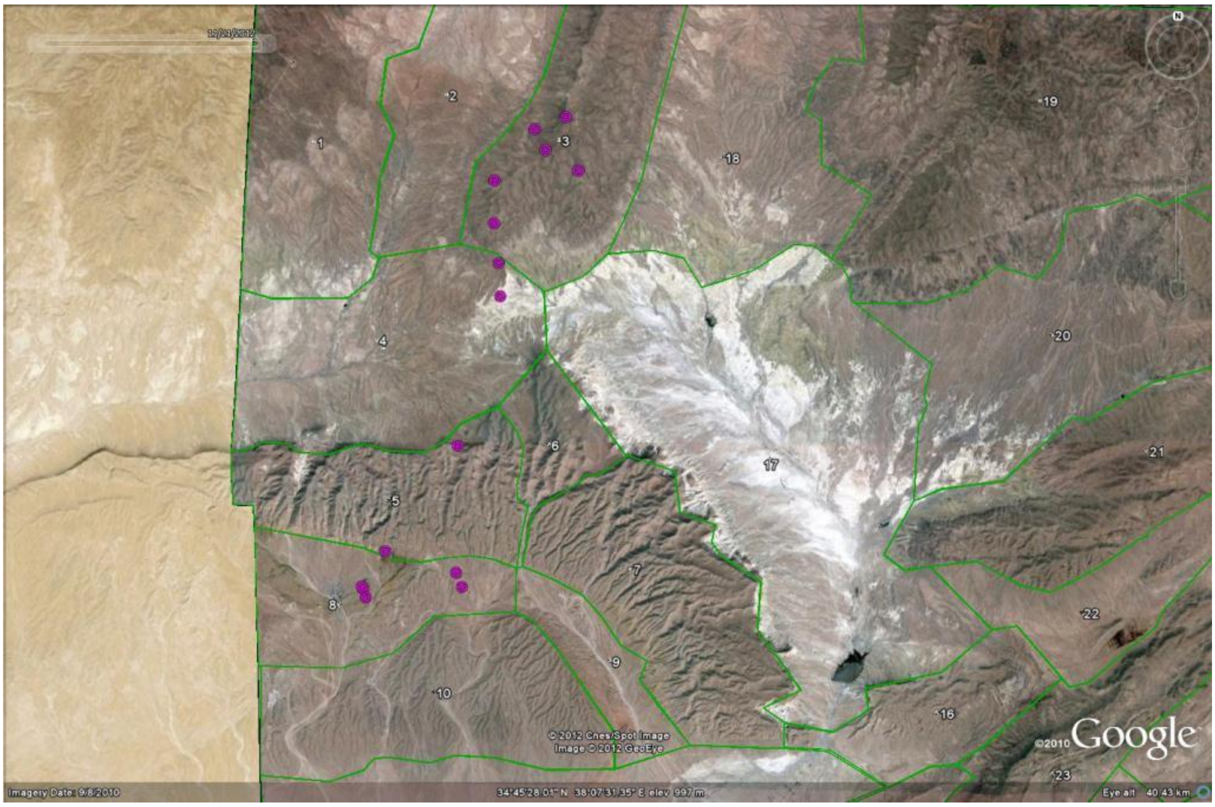



**Figure 4.48:** Map of tumuli sites where flint flake and tool scatter have been recovered during the ground surveys. Some of the sites in **Figure 4.46**, **Figure 4.47**, and **Figure 4.48** may overlap, i.e. have material from more than one period. The relatively large amounts of Roman/Byzantine finds is not very surprising, considering the massive presence of archaeological remains dating to this period in the area in general. However, the number of finds and amount of material recovered is unfortunately too slight to provide any patterns of significance. Additionally, it is at the present time being stored in the basement of the Palmyra museum in a war-torn Syria, and thus unavailable to this research.

The Palmyrene burial monuments have to a much larger extent potential for relative dating as many are associated with other archaeological structures in close proximity. Some of the tumuli lie in clusters where, as mentioned, the smaller of the structures are often situated on the periphery, but still seemingly in relation to a central, larger tumulus, which therefore presumably is of an earlier date (**Figure 4.49**). However, this method of relative dating is still only hypothetical, but as will be shown below (cf. 4.7.3) it has been shown to have some merit in the comparative material. On the other hand, the presence of a tumulus cluster or complex (cf. **Table 4.2**) does not necessarily preclude an obvious central monument with peripheral satellites around. Some of them include only tumuli of seemingly same character – i.e. size, type, and communicative quality.

**Figure 4.49:** Cluster of tumuli (cf. appendix 1, nos. 208-218) on a spur in the lowest foothills of southern Jebel Merah, looking out over northernmost Wadi Abyad and the watershed into Wadi Massadeh. Of these, there were one or two central tumuli which seemed to form focus around which other cairns or auxiliary structures of varying shapes and size had been constructed. However, the central ones were only somewhat larger than the surrounding cairns, and not monumental as such. On the other hand, the complex itself stood clearly out in the landscape.

Other examples are found integrated in or on the periphery of Roman sites, e.g. lying next to or near evident buildings, creating a contextual mismatch in complex. For instance, no. 273 (cf. appendix 1) – situated on the very pinnacle of Jebel Merah – lies right next to site 374 (cf. Meyer 2011, pp. 105-107), but the Roman building or buildings incorporated into the latter site had clearly disturbed a tumulus cluster or complex which once lay on this mountain top. This suggests that the tumuli here are at least of a pre-Roman date, although only one currently remains while the others have been obliterated. Similarly, site 215 including site 222 (cf. Meyer 2011 - also cf. **Figure 4.8**, no. 3) seems to have been some form of Roman estate situated in a sheltered valley in the interior of Jebel Merah. However, this valley has clearly been a localised centre of activity both before and after Roman times. Several tumuli lie on the hillocks in the immediate vicinity, and it seems unlikely that these had been allowed to be constructed so close to the buildings while the estate was in use. In addition, overlying the

Roman buildings, as well as over two of the tumuli (appendix 1, nos. 248-249) on a central hillock near the local wadi conflux, is an extensive Islamic cemetery (**Figure 4.50**) both showing ritual continuity and suggesting an earlier date of the nearby tumuli.

**Figure 4.50:** Examples of recent Bedouin burials overlying ancient structures in the main interior valley of southern Jebel Merah, the latest additions to a local area of high activity from prehistory, through the Classical periods, and into recent times. Al Matna, the highest peak in the Palmyrene, can be seen in the background straight down the wadi – which incidentally is route no. 3 in **Figure 4.8**, **Figure 4.12**, **Figure 4.13**, and **Figure 4.25**.

In fact, there are many instances of Islamic graves overlying tumuli in the Palmyrene (cf. appendix 1), showing that the tumulus burial form or at least some of the types are pre-Roman structures. On the other end of the scale, the examples of burial monuments integrated with kites in the region (**Figure 4.51** – also cf. **Figure 4.45**), with a position on the antennae, in the inlet or even in the middle of the trap itself clearly suggests a later date than that of the kite construction – although subject to whether or not they acted as markers for the animal drives as argued by Legge and Rowley-Conwy (2000, p. 444) – and are probably postdating the final use of the kites, due to their obstructive location. The best documented periods in prehistory of kite use are as mentioned the Chalcolithic and parts of the EBA (cf. 4.5.5.3). Nadel et al. (2010, pp. 984-87, table 1) found that kites in the Negev desert could be dated to the early part of the EBA by $^{14}C$-dating of postdated plant remains. In light of this, it would seem that many of the tumuli associated with kites were erected during the last half of the EBA and perhaps into the MBA (cf. 4.7.3), although the full temporal horizon for Palmyrene tumulus construction still could be a lot wider.


**Figure 4.51:** Two examples of tumuli integrated with kites. Left: Kite in Jebel Safra (21) with a large tumulus featuring foot chain placed on its eastern antenna. The foot chain takes up nearly half the fenced inlet at that point (c. 12 of 24 m width). Right: Kite in Jebel Mohamed ibn Ali (23) with a tumulus right in the middle of the entrance funnel, taking up at least a third of the available space. In both these examples the kite is interpreted as *predating* the burial monuments, as the positioning of these tumuli would hinder the functionality of the kite greatly. In addition, barring any ritual significance, it seems likely that the hunters building the kites would have avoided these monumental tumuli, given the wide range of spatial alternatives.

Tumuli integrated with stone enclosures provide similar relative dating, but on the opposite side of the diachronic picture. In all the cases where such circumstances have been investigated on the ground, the stone enclosures have been built secondarily from construction material taken from nearby or adjacent tumuli, which obviously have been disturbed to some degree by this activity. However, the many possible usages of stone enclosures as structures – e.g. some simple ones could easily function as pens – make their association with tumuli and the relative chronology less useful in a general analysis, except on a case-by-case basis. Some are intrusive or obstructive and obviously of more recent nature, while others are respecting the context of the mobile pastoralist technocomplex to a much greater degree (e.g. cf. **Figure 4.35**). Apparently, an alternative approach would be necessary to clarify the chronology of Palmyrene burial monuments, which also was one of the main objectives for the 2011 campaign undertaken by the Palmyrena project – an attempt to date certain tumuli radiometrically through the use of OSL.

### 4.6.2 Dating by optically stimulated luminescence (OSL)

#### *4.6.2.1 Outline of OSL theory and sample collection*

Evidently, the pottery and flint scatter around the tumuli, while possibly and sometimes tentatively being associated with the erection of the structures or interment of bodies, are of a secondary nature, and arguably could be linked to activities either pre- or postdating them.

The only way to actually date the construction would be to acquire material from a sound archaeological context – preferably material suitable for radiometric dating, thus potentially providing absolute dates. However, without the opportunity for excavation, there is little chance of collecting charcoal suitable for $^{14}C$-dating, and any carbon material not *in situ* has too uncertain provenience to be methodically acceptable for such sampling. This is why the Palmyrena project instead opted for an approach which under the circumstances could potentially be applied in the arid steppe of the Palmyrene – optically stimulated luminescence (OSL) dating. This method increasingly used with success on a variety of archaeological sites during the last two decades of its existence, although mainly during the last decade has it developed into a finely tuned tool for establishing chronology in situations where typological pottery and charcoal are absent. In short, OSL can, when all precautions are followed and the conditions are right, be used to figure out how long time has passed since grains of quartz in sediments have been exposed to sunlight. The method is based on the concept that impurities in these grains trap and accumulate naturally occurring radioactivity, which is released again if they get exposed to sunlight, in this way emptying and resetting the grains. If the sediment gets buried once more, or rather is blocked from light exposure, radioactivity starts accumulating in the impurities yet again. The amount of trapped radioactivity (or paleodose) when emptied can be measured in laboratory conditions, and thereafter reproduced in the same sample by irradiation leading via a complex process and calculations to an absolute date for the sample (e.g. cf. Murray & Wintle 2000). However, a number of preconditions must be met, both naturally and methodically, for this approach to be useful. For instance, the nature of sediment deposition can have had an effect on the bleaching (i.e. resetting) of grains, where e.g. aeolian (windborne) deposits are more likely to have been emptied of radioactivity, while fluvial (waterborne) processes have been shown to exhibit mixed results in this regard (e.g. Singarayer et al 2005, p. 13, with references). Incomplete bleaching can result in the paleodose being higher than the deposit actually is, as a residue of radioactivity would add on to the post-depositional paleodose accumulation.

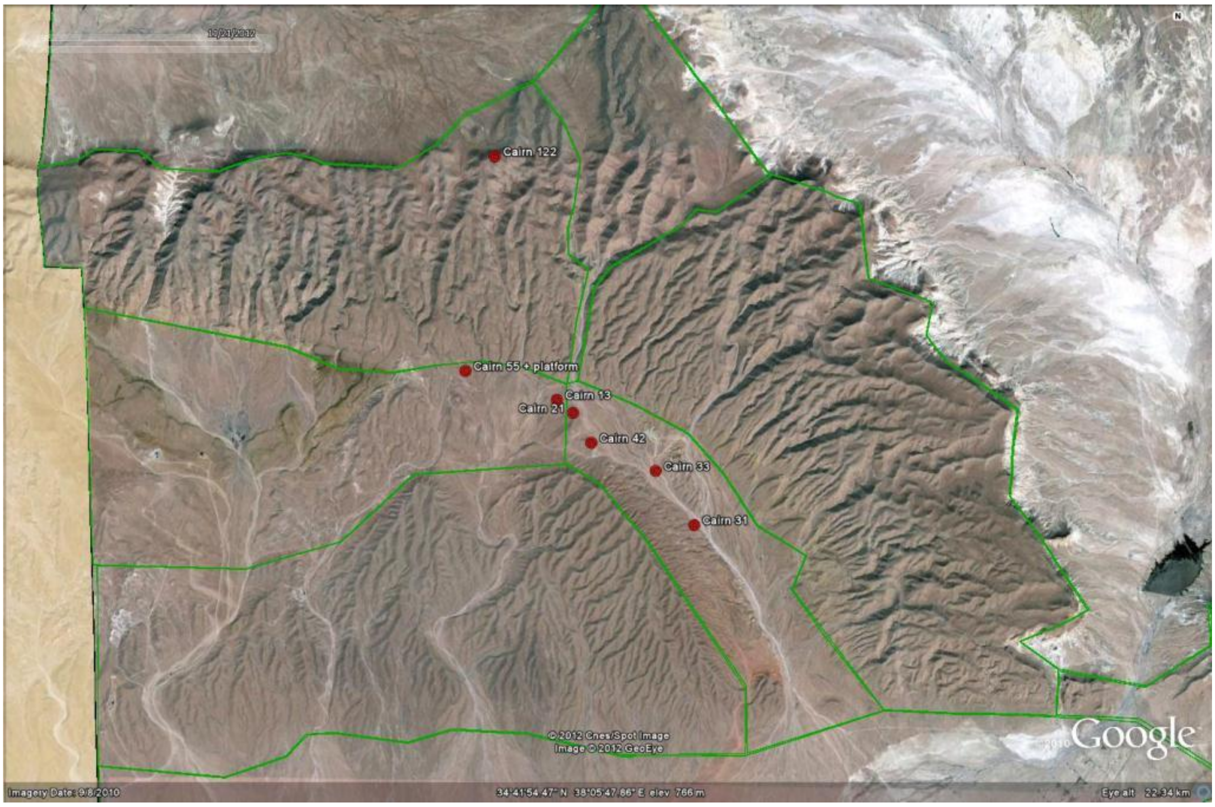



**Figure 4.52:** Map showing the tumuli chosen for OSL sampling in Jebel Abyad and the surrounding area. They were all recorded during the 2009 survey, while sampling was carried out in 2011. In the Wadi Takara/Jazal area, the chosen tumuli were nos. 13, 21, 31, 33, 42, and 55 with a sample from its associated platform (cf. **Figure 4.54**) and along the northern wall of Jebel Abyad a sample was collected from no. 122.

Many of the structures in the Palmyrene can be viewed as suitable for OSL sampling, particularly some of the monumentals and cairns (cf. 4.1.3). The underlying theory is that the perimeter blocks *in situ*, which often define these tumulus types or associated refurbishments such as platforms, have been placed on top of sand sediments, either right on the ground or in a shallow pit, in which case the grains are believed to have been sufficiently bleached by the sun, and in this way covering a deposit and resulting in accumulation of an accurate paleodose (e.g. cf. Baran et al 2003, p. 1265 – cf. **Figure 4.53**). As noted earlier, Holzer et al (2010, p. 810) applied this exact method to date kites in the Negev, and collected samples from both under stones placed in the ground during construction and from trapped sediments between construction stones, which accumulated after construction and possibly due to abandonment of the structure. They collected samples taking necessary precautions to prevent light exposure and applied orange-red light for laboratory procedures for the same reason. However, they chose to use the slightly different infrared stimulated luminescence (IRSL) on feldspar, due to poor luminescence properties inherent in the local quartz. The procedure was met with success, as they could show internal consistency between both IRSL dates and $^{14}C$ dates, thus proving that the former method was reliable for such circumstances (Holzer et al 2010, p. 813). The fact that they managed to provide such consistency show that issues like the one that faced Helms and Betts (1987, pp. 47-49) is now overcome:

*"By their very nature 'kites' are virtually undatable since they are built directly on bedrock in most cases, and since they have repeatedly been altered"*.

The samples chosen for dating by the Palmyrena project (**Figure 4.52**) have gone through essentially the same process. They were extracted from just beneath the perimeter blocks defining the tumuli (cf. **Figure 4.53** and **Figure 4.54**), and should therefore theoretically date the time passed since the perimeter was embedded in the ground and the sand underneath has been blocked from sunlight. To ensure that the samples stayed unexposed to any light which potentially could bleach and thus contaminate the quartz grains (Bailey et al. 1997, p. 123) they were extracted using only long-wavelength red-filter light for visibility, which should not have enough energy to bleach the grains. Apart from this, complete darkness was kept during the whole procedure under a thick and heavy piece of cloth c. 6 m by 6 m in size, specially acquired for the purpose (**Figure 4.53** – right). The execution of the method was carried out by strictly following these steps:

1. A pit with a depth of c. 10-15 cm dug about 20 cm in front of the perimeter block. This initial step was for practical reasons carried out in daylight, mainly because of the extremely hot and exhausting conditions prevailing under the sun once inside this chamber.

2. The cloth was then put over the excavator, covering him in darkness, who continued by cleaning the profile of the initial pit all the way in to the block facing.

3. Under red light, a hard plastic tube was hammered with a rubber mallet into the profile as close to the bottom of the block and as deeply and horizontally as possible.

4. The tube was gently eased out and removed from the profile, with each end of it filled up with plastic finds bags. Finally, it was sealed off on both sides with thick layers of duct tape and marked.

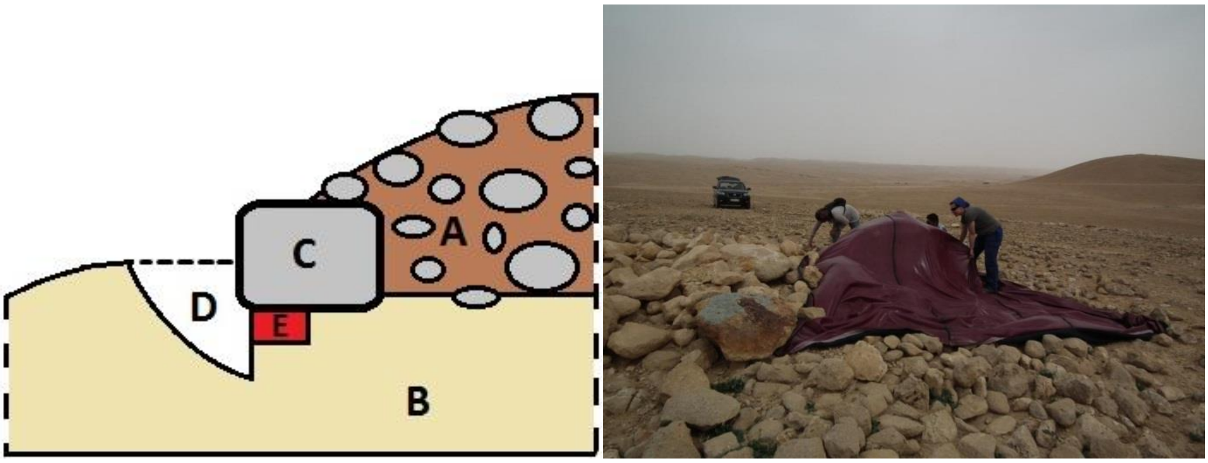



**Figure 4.53:** Schematic representation of the method for collection of soil samples for OSL dating (left). A) Cairn fill, B) Natural subsoil, C) Perimeter block, D) Pit dug to create a profile, E) Sampled area. To prevent any light contamination reaching the samples, the process was carried out beneath a thick and heavy piece of cloth measuring 6 m by 6 m, creating pitch black conditions, which was countered by using torches of low energy red light (right).

**Figure 4.54:** Platform structure associated with cairn 55, constructed of blocks, showing the structure before the sampling pit was dug (left), and after sampling has been carried out (right). This particular block had a vertical depth of c. 10 cm, but some went deeper down. The sample was collected immediately under the bottom of the block, and the method has been shown by other archaeological researchers to be reliable in similar conditions (cf. Holzer et al. 2010).

### *4.6.2.2 Results from the OSL approach*

Unfortunately, after taking all the apparent precautions, the method was not met with success. According to the OSL dating laboratory at Risø in Denmark, an initial issue was that the samples were small (c. 65-20 g) and very fine-grained, which meant that they had to apply the method to silt-sized grains instead of the regular sand-sized ones. Presumably, these have adverse characteristics than sand, e.g. when it comes to sufficient bleaching before deposition

(Murray, personal communication, 24. November 2011). Further issues arose regarding dosage of radioactivity within the grains, which initially seemed very scattered. This can be a result of sampling errors as well as internal characteristics of the sediments themselves, but this is hard to establish. However, subsequent measurements showed that the scatter was confirmed, with the consequence that the samples were undatable (Murray, personal communication, 14. November 2012). The researchers at Risø concluded with the suggestion that tighter sampling control and larger samples would be necessary. All things considered, I would argue that the Palmyrena project could not have been more prudent in our execution of the sampling process. There were considerable obstacles and impracticalities to overcome just to arrive at the point we did, both due to the available equipment and logistics, and while we cannot say if the error lies in sampling or in the quality of the samples themselves, I believe it must have been the latter. The four-point process outlined above does refer to optimal conditions, which certainly did not occur every time. The variation in depth of the perimeter blocks and omnipresent pebbles and small rocks in the soil, albeit invisible to the sampler, generally complicated matters further. There is no initial reason for the underlying theory and procedure itself to be flawed, as Holzer et al. (2010) showed successful results, and the sampling was carried out scrupulously. Perhaps we have merely been unlucky with the local geological and sedimentological circumstances, although it seems peculiar that no useful information at all was possible to extract from a dozen samples from just as many sites spread out over c. 15 $km^2$. However, it must unfortunately be said here that at the time of writing, the available information issued from the Risø laboratory to which the samples were sent has consistently been lacking to the point of negligence. Regrettably, the final suggestion from the laboratory – that is, to acquire further and larger samples – is obviously impossible for any Syrian sites at the present time.

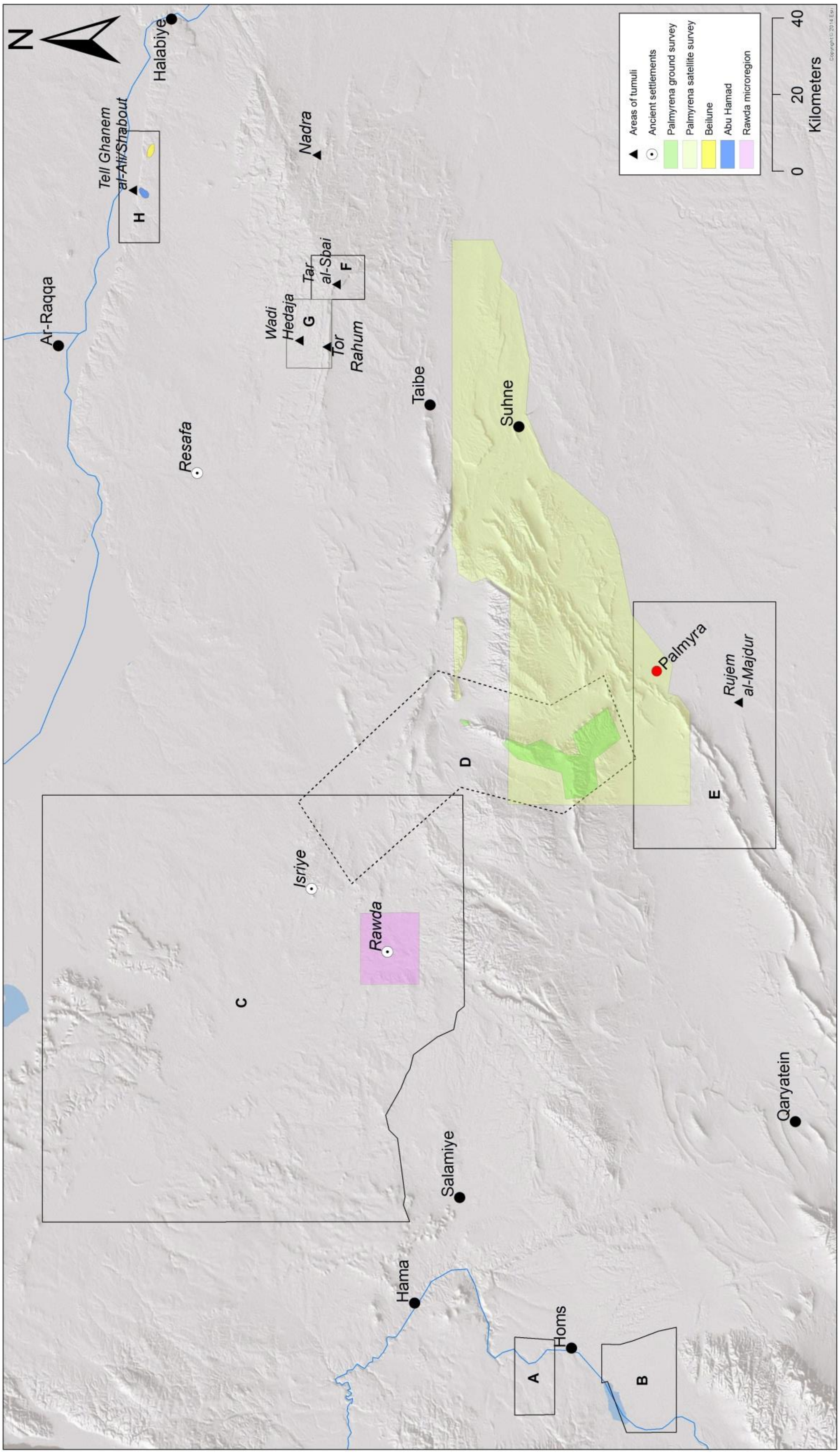
The remaining question is what should be done differently in the future to ensure positive results under similar conditions? The Palmyrena project opted for the single-aliquot approach, but could have asked for the samples to be dated by the much more costly single-grain OSL. Baran et al. (2003, p. 1270) have argued that while OSL is the only method which can date material firmly associated with a stone structure, the single-grain method provides significant additional information to the single-aliquot approach. Single-grain method has also been applied by Jacobs et al. (2006, p. 262) for rejection of grains not behaving appropriately, to investigate whether or not the sediments have experienced heterogeneous bleaching, or to establish any inclusion of weathered sandstone fragments (cf. Roberts et al 1999, p. 392), all of which are processes that can skew the results from an aliquot of several grains. However, as the reason for the samples not yielding any positive data is unclear and there are no possibilities for acquiring additional samples, this is merely a theoretical exercise and I cannot really determine whether or not a single-grain approach would have helped matters.

Thus, it seems that any secure absolute dating of the Palmyrene tumuli continues to elude us and their Bronze Age origins are still mostly hypothetical, particularly with inconclusive results from the radiometric approach. If these can be acquired by applying an alternative technique, they will present a major breakthrough in the chronology of the Palmyrene and central Syria. Based upon the experience obtained by the Palmyrena project, the most likely process that would yield such results has to focus upon a highly controlled sampling procedure from carefully selected construction features, character of sediments – preferably sand-sized grains – and amount of material included in the samples, and the single-grain OSL dating approach, although this requires considerable economic resources and more importantly, time, and opportunities. The prize could of course be reliable absolute dates for the erection of burial monuments and other structures within a chronologically relatively uncertain technocomplex. As this is still lacking, I will have to turn to comparative material yet again for the chronology of Palmyrene funerary monuments.

## 4.7 Other archaeological research into central Syrian EBA and MBA

Zarins (1992, p. 42) argued that a major break in the technocomplex occurred toward the end of MBA I, following a period of decline and change since some time in the EBA IV (thus c. 2200-1850 BCE). Up to this period the arid regions of the Near East were characterised by a dramatic increase in archaeological structures as a result of great expansion into these areas. However, until very recently as mentioned little archaeological work with a focus on Chalcolithic and Bronze Age archaeology has been carried out in the central Syrian region. Although the Palmyrene proper until the late 2000s really remained a blank spot in modern archaeology focusing on these periods – aptly illustrated by **Figure 4.22** – adjacent regions of central Syria have been subjected to a certain amount of limited investigation regarding contexts from late 4$^{th}$ to early 2$^{nd}$ millennium BCE (**Figure 4.55**). This started in the 1990s, although increased significantly in intensity toward the late 2000s, when the Palmyrena project also was initiated. However, any research themes of that particular spatiotemporal context should still be viewed as pioneering work, and particularly within a context of mobile pastoralist populations. I will in this subchapter for comparative purposes present on-going work similar to this one focusing on the same aspects in time and space.

**Figure 4.55 (next page):** Map of areas in the Palmyrene, Jebel Bishri, and adjacent regions subjected to surveys and research dating to the EBA and MBA mentioned in 4.7, as well as the areas directly surveyed by the Palmyrena project and this study. The main areas are: **A**) Northern Homs NSA, **B**) Southern Homs NSA, **C**) the French northern steppe surveys, **D**) the Palmyrena project concession area, **E**) the Syro-Italian Palmyra region field work, **F**) the Finnish SYGIS survey, **G**) the Syro-Japanese Bishri field work, **H**) the Syro-Japanese Euphrates field work. Areas of detailed research are referred to in the map legend. Based on Philip et al. (2011, p. 45, fig.1), Geyer and Calvet (2001, p. 59, fig. 2, 63, fig. 4b), Bonacossi and Iamoni (2012, p. 32, fig. 1), Lönnqvist et al. (2010, p. 388) and the SYGIS webpage (http://www.helsinki.fi/hum/arla/sygis/tar.html).


N
Halabiye
Tell Ghanem
al-Ali/Shabout
H
Nadra
Ar-Raqqa
Tar
al-Sbai
F
Wadi
Hedaja
G
Tor
Rahum
Resafa
Taibe
Suhne
Palmyra
Rujem
al-Majdur
D
E
Isriye
Rawda
C
Qaryatein
Salamiye
Hama
Homs
A
B
Areas of tumuli
Ancient settlements
Palmyrena ground survey
Palmyrena satellite survey
Beilune
Abu Hamad
Rawda microregion
0
20
40
Kilometers

### 4.7.1 The French surveys in the extended Rawda region

In the northwestern region bordering on the north Syrian plains from Sahl Isriyeh toward Jebel al Has and the Jabbul, a French team carried out surveys from the late 1990s and a decade onward. They focused on a wide chronological horizon stretching from the Bronze Age to the Byzantine period, and located over 90 sites dated to EBA IV, on which I here will concentrate (e.g. Geyer et al. 1998 – for survey area cf. Geyer & Calvet 2001, p. 61, fig. 3, reproduced here in **Figure 4.55**, area C). Some of their research and results have also been incorporated into 4.5.4.2. Much attention was paid to investigate the limits of sedentary occupation and in particular the microregion surrounding the now well-known contemporary site of Rawda (cf. Castel 2008; Castel & Peltenburg 2007 – cf. **Figure 4.55**). A number of kites and tombs were documented, but the latter group incorporated mostly shaft tombs or cist tombs, with a smaller number of what they termed *circle tombs*, from the description possibly structures similar to some of the smaller cairns recorded by the Palmyrena project, as well as only one looted tumulus (Castel 2008, pp. 304-305). The conclusion they provided was that the area should be viewed within an agro-pastoralist economic context associated locally with the town of Rawda, but regionally possibly linked with the political sphere of Ebla (Castel & Peltenburg 2007, p. 613; Castel 2008, pp. 306-307). The context was based on the apparent intensive exploitation of what is essentially a sub-optimal landscape, building walls across wadis and *faydas* and using natural widening of the wadi floors to seasonally accumulate water and creating locally favourable conditions for agriculture, to heighten the potential for resource availability (Castel & Peltenburg 2007, p. 603; Castel 2008, p. 305). However, they also argued that the main activity probably was of a pastoral kind, suggested by archaeological structures like stone circles, some of which probably can be likened to stone enclosures (cf. 4.5.4) and produced pottery of a late EBA IV date (Castel 2008, p. 306, note 20), as well as kites (cf. 4.5.5), all with entrances toward the *west* – thus contrasting with the mainly southeastern focus of the kites surveyed in this study (cf. 4.5.5.2 and **Figure 4.43**). These kites often featured nearby man-made ponds, which was attributed to the watering of domestic herds (cf. Castel & Peltenburg 2007, p. 609, fig. 9). Thus, this last aspect the researchers argued increased the likelihood of kites having a pastoral function rather than being associated with hunting. Although they could not confirm the use of these structures being confined to the EBA IV, they argued that at least some of them were being used during that period due to their proximity to Rawda and the rarity of sites from other periods in this particular microregion, as well as based on a limited amount of pottery scatter (Castel 2008, pp. 305-307). The last occupation phase of Rawda has been dated to the very end of the EBA IV – i.e. about 2100-2000 BCE (also cf. 5.2.2.2) – although whether the abandonment was caused by climatic deterioration, environmental consequences of overexploitation, or sociopolitical reasons remains uncertain (Castel 2007, pp. 171-174; Castel 2008, p. 306).

### 4.7.2 The Finnish SYGIS project in Jebel Bishri

The eastern parts of central Syria have also been subjected to investigation in recent years, both by the Finnish SYGIS project and a Syro-Japanese project in the steppe region of middle Euphrates (cf. 4.7.3). The SYGIS project (cf. Lönnqvist 2008; 2010; Lönnqvist et al. 2010) focused on Bronze Age mobile pastoralist groups in the mountains of Jebel Bishri (**Figure 4.55**, area F and the Nadra site), thus topically quite close to the aims of the Palmyrena project and indeed this study, although their research was more specifically linked to ethnicity. They aimed to trace ethnic boundaries, and particularly tried to identify the so-called Amorrite tribes frequently mentioned in sources of the late 3$^{rd}$ and early 2$^{nd}$ millennium BCE in the Near East (cf. 3.2.6, 3.3.3, and 5.3.1), by locating and recording structures which they argued can be linked to mobile pastoralist activity in the region – mainly tumuli and stone enclosures (Lönnqvist 2010, pp. 165-166). Their specific association between such archaeological structures and an ethnic group from Bronze Age sources may be debatable, and the ethnic designation of this particular group has in fact recently been challenged (cf. Porter 2012 – also cf. 5.3.1.3), but they did document several structures which are directly comparable with those in the Palmyrene based on structural form and context. In general, the descriptions of tumuli size and construction material in their survey area share many similarities with Palmyrene ones (cf. 4.1.3). They also emphasised topographical context of ridges or hillocks for communicative significance, although did not mention the wadi entrance or crossroad aspects found to be the case further west (cf. 4.2.3). Block-lined perimeter foundations is a frequent and shared feature between the tumuli of Jebel Bishri and the Palmyrene, as well as occasional foot chains surrounding the larger burial monuments, which in their terminology are called *ring-tumuli* (Lönnqvist 2010, p. 166, and fig. 2-4 – also cf. **Figure 4.2**). In total they recorded about 50 tumuli at 27 sites covering an area of just 0.25 km$^2$, and EBA IV pottery was found associated with one of these, although they also found Neolithic flint material at the sites. Another of their areas contained a ring-tumulus they tentatively dated to the Chalcolithic or the EBA-MBA, based on flints and pottery from a nearby settlement and comparison with a similar structure in the Golan Heights. They interpreted the clusters found in the first area as family cemeteries, with ring-tumuli having been erected for or over a patriarchal ancestor or chief, while the large ring-tumulus at another site they attributed to a top-ranking member of a chiefdom society (Lönnqvist 2010, p. 168; Lönnqvist et al. 2010, p. 373). The specificities in these interpretations may be debatable, as it provisionally does seem to have been rather overpopulated with tribal leaders in the Palmyrene if each large tumulus with a foot chain should contain some sort of top-ranking tribe member. However, the tendency for centripetal qualities to follow the monumental tumuli does indicate some sort of hierarchical aspect, although without actual investigation through excavation, the reasons would have to remain hypothetical. I will limit myself here to merely suggest an association with lineage (cf. 5.4). Interestingly, the description of their site A 27 at Tar al-Sbai (**Figure 4.55**, within area F) (cf. Lönnqvist 2010, p. 169) incorporates a feature which also has been found next to tumuli nos. 30-31 in Wadi Takara (cf. appendix 1 and **Figure 4.6** – left), namely a row of small petal- or hearth-like structures in close proximity to central monuments (**Figure 4.56**). Pottery dated tentatively to EBA IV was found as scatter on this site by the Palmyrena project in 2009 (cf. Anfinset 2009), although such a presumably extensive funerary complex – arguably the most elaborate of all those found by ground survey in our concession area – could of course have had a long and continuous ritual use. Finally, the SYGIS project also recorded a number of stone enclosures[20], again comparable to those found in the Palmyrene with regard to variety and sizes. They interpreted these to be animal pens for domesticated goats or sheep associated with steppe-dwelling nomadic pastoralists (Lönnqvist 2010, p. 166).

[20]*Stone circles* in their terminology, following Zarins (1992).

**Figure 4.56:** Petal- or hearth-shaped structures found lying in a row of at least five or six in association with the funerary complex incorporating tumuli nos. 30-31 (appendix 1). Such structures were seemingly also found by the Finnish SYGIS project in Jebel Bishri, if their description is accurate and interpreted correctly here, suggesting specific structural similarity over large areas within essentially the same biome.

### 4.7.3 The Syro-Japanese project in Jebel Bishri

Research carried out by the Syro-Japanese team in Jebel Bishri has undoubtedly led to the most significant advances in our understanding of archaeology in the eastern central Syrian arid landscapes. They undertook both excavations at the settlement site Tell Ghanem al-Ali, located c. 50 km downstream from modern Raqqa, as well as surveys in the Jebel Bishri highlands, including key excavations at cemetery sites on the Euphrates terrace (Wadi Daba), on the steppe terrace just south of the settlement (Wadi Shabout), and most importantly for this study in the steppe interior of the highlands (Tor Rahum and Wadi Hedaja) (cf. Numoto & Kume 2010; Nishiaki 2010; Nakamura 2010; Fujii & Adachi 2010 – cf. **Figure 4.55**, areas G and H, including associated site designations). Their focus was on social and chronological associations between the settlement at Tell Ghanem al-Ali and these cemeteries, and they actually acquired absolute dates for some of the sites. Occupation at Tell Ghanem al-Ali was found by radiocarbon dating to stretch through the entire EBA, with the earliest date at c. 3000 BCE and last occupation layers dated to 2400-2050 BCE, and thus showed consistency with the surface scatter of pottery and excavated material, in both instances dated to EBA III and IV (Nakamura 2010, p. 127, fig. 6 and table 3). The cemetery at Wadi Shabout was described as lying on the northern edge of Jebel Bishri, being part of an area which contains thousands of plundered graves (Numoto & Kume 2010, p. 50). The researchers divided the various types of burial monuments located at the sites of Wadi Shabout and Wadi Daba into four distinct types based on morphology and topographical context. Underlying a tell near the plateau edge, two burial cairns dated by associated material to the late 3$^{rd}$ millennium BCE were discovered. These had apparently been destroyed in the Hellenistic or Roman period. Slightly further inland, but still overlooking the settlement at Tell Ghanem al-Ali, was a number of subterranean stone chamber or cist graves, while somewhat further inland from these a mix of stone chamber and shaft graves were recorded. Lastly, the team recorded several shaft graves in Wadi Daba closer to the settlement and the Euphrates (cf. Numoto & Kume 2010, pp. 51-52). All these burial monuments have been chronologically placed in the EBA III-IVa (Nishiaki 2010, p. 44), but with an internal sequence following the description above from first to last respectively, and interpreted to be a manifestation of ancestor worship structure starting with mobile pastoralist beginnings and developing toward a sedentary or sedentary/mobile mixed population in the area, centered on Tell Ghanem al-Ali (Numoto & Kume 2010, pp. 7-58; Nishiaki 2010, p. 44). Based on comparative work on the Abu Hamad cemetery, which is also situated on the plateau just above the river valley and thought to contain thousands of graves, Nishiaki (2010, p. 45) suggested that this zone may be a transitional burial zone between settled and mobile members of the same community, albeit on an unknown tribal level. Abu Hamad is presumed to contain thousands of graves in various necropolises within about three $km^2$, where 20 of them were excavated and 300 more have been documented (Meyer 2010, p. 156). The burial monuments were also here (cf. Meyer 2010, pp. 157-158) divided into four types – shaft graves, stone cists with slab, and earth graves and cists with stone cover, the latter two of which i.e. are tumuli according to the definitions here (cf. 4.1.3) – seemingly similar to the four types defined by the Syro-Japanese team. There are several variations within the horizon of the latter two types, although the burial chambers are described in these words:

*"(...) side-walls are not made of stone and they do not reach as deep down* [as stone cists with slab]" (Meyer 2010, p. 158 – my clarifications in brackets).

They were also said to appear in groups of two and three and used for single burials, all of which are very similar in description to many of the tumuli recorded in the Palmyrene. One area, Abu Hamad necropolis J, contained stone cists or single graves each *covered by a tumulus*, morphologically homogenous, and not containing any shaft graves, circumstances recurring in seven of the other necropolises (Meyer 2010, pp. 159-160), again a very comparable situation to some tumulus clusters in Jebel Merah (e.g. Taniyet ez Zerr, but also several others). This internal relation was interpreted to represent family structures, while more heterogeneously mixed areas (e.g. necropolis E), with a few large shaft graves or where large tumuli are surrounded by smaller versions, were attributed to possible stratification along familial and/or politico-ethnic lines (Meyer 2010, pp. 160-161). The Abu Hamad cemetery as a whole has been dated by pottery to EBA III-IVa, but if the temporal perspective is only c. 150 years (5-6 generations), the site must have served a larger population than just that living at the nearest settlement, which was Tell Ghanem al-Ali. However, the settlements adjacent to it probably had their own cemeteries close by, and the Abu Hamad structure is therefore suggested to represent kindred groups at a family, extended family, and lineage/clan level (cf. 5.1.2.2 and 5.2.1.3 for more on this topic), depending on the specific necropolis (Meyer 2010, pp. 161-162), as well as possibly indicating a

*"(...) transition from a nomadic lifestyle (central burial) to a sedentary one of life in villages and towns (family groups)"* (Meyer 2010, p. 162).

This is arguably also discernible in the associated pottery assemblages, which for the burials representing mobile members of the community included not only local wares, but also ceramics from northeastern Syria (Meyer 2010, p. 162). Interestingly, very few MBA tombs were discovered in the lowland area or in the morphologically mixed cemeteries, and apart from one site, Jazla, no MBA settlements have been found either. However, there seem to be large concentrations of morphologically homogenous cemeteries in the *interior* of Jebel Bishri, which in fact have been dated to the MBA (Nishiaki 2010, p. 45 – see below). Can this pattern indicate a shift to a more mobile lifestyle from the EBA to the MBA in Jebel Bishri?

The Syro-Japanese exploration of the steppe fringes of Jebel Bishri was conducted in 2008-2009 in a fashion similar to the one carried out by the Palmyrena project, and they identified 195 sites, dating from the Palaeolithic to the Islamic periods, but with as many as 90 of these being placed in the EBA. The researchers argued this suggests widespread expansion into more arid environments in the 3rd millennium BCE, and the corpus included sites of long-term occupation, transitory camps identified by the *Shaboutian* flint industry first described by their project and also found in datable layers at Tell Ghanem al-Ali, flint quarry sites, and finally numerous cemeteries, including the ones at Wadi Shabout mentioned above, but also others (Nishiaki 2010, pp. 39-42). One of these cemeteries, located at Beilune (cf. **Figure 4.55**, area H), included:

"(…) *clusters of cairns or mounds with stone chambers (...) dense concentration of more than one hundred mounds, each approximately 2-3 m in diameter and 1 m in height. They* *were built of gypsum rocks and contained stone chambers. Some cairns formed larger mounds (...) containing several stone chambers that were linearly placed"* (Nishiaki 2010, p. 43).

They were dated to the EBA by the scatter of Euphrates Banded Ware from plundered tombs, but some of the cairns were seemingly untouched and thus of unknown date (Nishiaki 2010, p. 43). Again, the similarities in context and form with many of the structures in the Jebel Abyad and Jebel Merah areas are striking, but the method of dating via pottery scatter from looted tumuli must initially be viewed with caution (cf. Bradbury 2011, p. 242). Finally, the Syro-Japanese project also surveyed an area of c. 150 km$^2$ in central parts of western Jebel Bishri (**Figure 4.55**, area G), i.e. an area similar in topographical and environmental context to the survey area of the Palmyrena project, although with mountains of lower altitude (500-700 m) and more plateau-like profile (Fujii & Adachi 2010, pp. 61-63; cf. Wirth 1971, pp. 54-55). Essentially, they recorded very similar burial monuments and contexts, with 398 cairns grouped into 35 *cairn fields*, and the topographical focus of these mainly being on mesas or along ridgelines, with very few on the fluvial wadi-plains. They characterised this as an area being densely concentrated with tumuli, which suggested activities of a large ethno-culturally homogenous group, probably having a spatial focus of funerary activities associated with features of long-distance visibility (Fujii & Adachi 2010, p. 63). However, their characterisation of a cairn field included tumuli described as:

*"(…) aligned at an interval of ca. 100-300 m, thereby forming a loose continuum ca. 1-2 km in total length"* (Fujii & Adachi 2010, pp. 63-64).

This is not what has been applied in the present analysis to characterise a *group* (cf. 4.1.4), but the argument behind this characterisation of a cairn field is understandable, as the tumuli often do have a visual and contextual association with each other on a larger scale than merely within a localised cemetery (cf. **Figure 4.9**). On the other hand, this would in fact mean that entire mountain ranges in the Palmyrene should constitute one large cairn field, because very few monuments lie isolated *more* than 100-300 m from another monument. I will therefore continue to keep the relationship between the burial monuments at a localised level here, i.e. within maximum 30-40 m, when describing a site as a cemetery, group, or complex of tumuli. Additionally, the chronological relations between the Palmyrene tumuli are still uncertain, although the hypothesis focuses on a Bronze Age time-frame. However, the research carried out by the Japanese team did provide highly valuable chronological and typological information regarding central Syrian burial monuments in the dry steppe highlands. Eight cairn fields and 52 tumuli were investigated by sondages, although only two areas, Wadi Hedaja 1 and Tor Rahum 1, have been described in Fujii and Adachi (2010). The former site consisted of two segments (A and B) with ten and four cairns, along lines of 1.5 and 0.6 km respectively, which all were opened for internal structural examination. These segments seem to have been defined by loosely linear alignments of tumuli based on size, meaning that a new segment would start where cairn size increased dramatically after decreasing serially. However, according to their map, the basis of analysis presented in **Table 4.2** would have resulted in at least seven of their tumuli lying isolated, with two separate groups of four (A: 05-08) and three (B: 12-14) cairns. Their description of external and structural characteristics of these is comparable to the Palmyrene tumuli on many points (cf. Fujii & Adachi 2010, pp. 65-66, and fig. 4):

- Constructed with undressed or partly dressed limestone cobbles and boulders.
- Roughly circular in plan, with diameter of 3-12 m and height of 0.2-1.2 m.
- Largest examples have internal constructions of double or triple peripheral walls (cf. **Figure 4.57**).
- Evidence of external stone-built features associated with larger ones, like boundary walls, U-shaped structures, or small stone concentrations forming a funerary complex.
- Smaller cairns on the other hand have usually none such features, with only a cist covered with cobbles.

Because the project had the opportunity to excavate some of the cairns, they could also describe the internal construction of many of them, revealing complex sequences of dry-stone masonry, fill, and auxiliary graves, opening up the possibility for typological classifications. In addition, while most of the tumuli were looted, a limited number of finds *in situ* was collected, with two cairns in this manner datable to the early MBA I. Arguing from tumulus typology[21] and topographical contexts, the researchers suggested therefore that the other

[21] Based mainly on internal structure, but partly also on differences in size, where large cairns are earlier and more complex and smaller cairns are later and simpler in construction (cf. Fujii & Adachi 2010, p. 69, fig. 8).

cairns within a segment are younger or older, depending on their position with regard to the two dated examples – meaning that the all the rest apart from one are mostly dating to the mid- to late-MBA I (cf. Fujii & Adachi 2010, pp. 66-71, and figs. 5-9). The other area, Tor Rahum 1, was tested in the same manner, where four segments started with a large cairn (called phase 1) and gradually decreased in size (toward their phases 3 and 4). Based on the results from Wadi Hedaja 1, they dated these segments typologically to MBA, supported by associated archaeological material dated to either MBA I or the terminal part of EBA (Fujii & Adachi 2010, pp. 71-72), as well as by a series of $^{14}$C dates suggesting a range of 1950-1600 BCE for these cairns (Nakamura 2010, pp. 125-127, fig 5 and table 3). Their conclusion was stressed as tentative, as was their typological chronology ranging from the EBA-MBA transition (phase 1) into the MBA I-II transition (phase 4) (cf. Fujii & Adachi 2010, p. 74, fig. 13), but they were more certain as to who erected these monuments:

*"*(…) *the arid environment, the total absence of contemporary settlement sites (…), the predominance of secondary burial, the scarcity of burial gifts (especially of potteries), and, instead, the concentration on small burial adornments – is suggestive of the involvement of mobile groups rather than sedentary populations"* (Fujii & Adachi 2010, p. 73).

The skeletal material (cf. Nakano & Ishida 2010) and the typological difference between the tumuli and burial monuments known from settled areas supported this conclusion. Combined with the material from Tell Ghanem al-Ali and cemeteries on the northern fringe of Jebel Bishri, the researchers suggested that a shift occurred from focus on the lowland/fringes in EBA to the highland/interior in the MBA (Fujii & Adachi 2010, p. 73), which also seems supported by the implications from Abu Hamad. This interpretation could be argued to fall in line with the analyses carried out by Wossink (2009), where a diachronic development of increased mobility and pastoral specialisation is suggested to have occurred from the mid-EBA to the MBA, but this is discussed more under 5.2.2.2. Testing this particular method for chronological control is difficult with regard to the Palmyrene material, as the internal structure of the tumuli remains largely unknown, although the presence of several internal wall constructions have been noticed in certain heavily looted monuments (e.g. **Figure 4.57**).

**Figure 4.57:** Monumental tumulus in Jazal (appendix 1, no. 68) which have been disturbed to the point of showing some several internal wall construction features which presumably originally have been covered with cobbles and rocks. This is comparable to discoveries made during excavation of large tumuli by the Syro-Japanese team in Jebel Bishri.

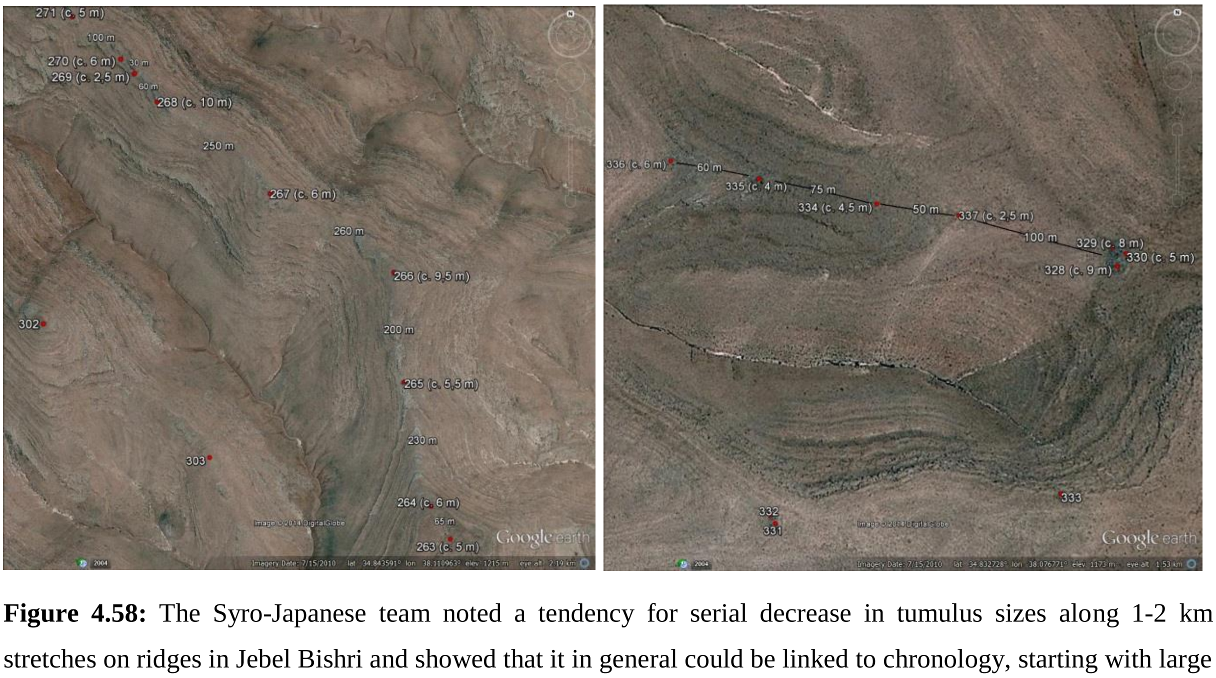



**Figure 4.58:** The Syro-Japanese team noted a tendency for serial decrease in tumulus sizes along 1-2 km stretches on ridges in Jebel Bishri and showed that it in general could be linked to chronology, starting with large and early (EBA IV) ones and ending with more modest later ones (MBA). An attempt to apply this method on clusters of Palmyrene tumuli does not seem to yield the same result, with no clear pattern of serial decrease in tumulus sizes along the ridges.

However, the method of serially segmented cairn fields of intra-tumuli relations based on decreasing size along a ridgeline does not seem to apply in the Palmyrene, with e.g. two well-surveyed ridges in Jebel Merah (nos. 263-271 and 328-330/334-337) evidently not following such a pattern (cf. **Figure 4.58**). These clusters consist of nine and seven tumuli respectively, separated by 30-260 m of empty stretches, but with diameters varying up and down from 2.5 to 10 m without any serial decrease, with the majority of them being sized c. 4-6 m. Although these are only two examples, they represent the general picture of tumulus relations vs. sizes in the Palmyrene, suggesting that this region on the surface does not seem to follow a pattern like that reported in Tor Rahum 1 or Wadi Hadaja 1 by the Syro-Japanese team – or indeed any clear pattern at all. However, again it must be stressed that much of the argument on tumulus sequences by Fujii and Adachi (2010) was based on *internal* structural technotypology, making a strict chronological argument based on size variations within relatively associated tumuli in the Palmyrena survey unreliable, particularly with so many tumuli being sized within a narrow horizon centered on a diameter of 5 m (cf. **Figure 4.58**). The Syro-Japanese team also argued that the occurrence of large cairns at certain intervals suggests a presence of several sub-segments (Fujii et al 2010a, p. 104), which seems particularly difficult to test without excavations.

Their annual site reports supported the impression that there are many similarities between the Jebel Bishri material and the Palmyrene material, but due to their more extensive recording, these reports also provide valuable information on a number of related aspects (cf. Fujii et al. 2009a; 2009b; Ohnuma & Al-Khabour 2008, p. 143, photo 9; Fujii 2009; Fujii et al. 2010a; 2010b; Nakano 2010; Nishiaki et al. 2011). The tumuli had a diameter range of three to ten meters in general, with most being around four to six meters, while surviving height stretched from 0.1 to 1.3 m, but lie mostly in the range of 0.3-0.5 m – all dimensions very comparable to patterns in the Palmyrena survey. The recovered grave goods usually consisted of assemblages that included flint artefacts or flakes, beads of carnelian, faience, perforated snails or cowrie shells, and bronze fragments or small objects like rings, daggers and pins. Some tumuli also exhibited at least three types of pottery, with sherds dating to the EBA-MBA transition, and many showed more or less fragmented human remains, clear evidence – if needed – that the tumuli were erected with funerary function in mind. Then again, some of the cairns, like many in the Palmyrena survey, were devoid of any finds or skeletal material. However, the grave goods of portable ornamental objects and little if any pottery is consistent with what one would expect in assemblages of material remains associated with mobile pastoralists, possibly displaying individual or group identity through such objects, and the skeletal material support the notion that the tumuli housed remains of individuals whose life consisted of a high proportion of walking, i.e. a mobile lifestyle. While the Palmyrena project has failed to find any human remains in association with the burial monuments, the scarce amount of material from tumulus sites in general, as well as the nature of it – i.e. a smattering of pottery, some objects of personal ornamentation, and one collection of bronze fragments (**Figure 4.59**) – does indeed suggest comparable assemblages to those recovered in Jebel Bishri by the Syro-Japanese project and supports the notion that many of the Palmyrene tumuli were erected by EBA and MBA mobile pastoralists.


**Figure 4.59:** Stone bead (left) found in association with tumulus no. 131 and bronze fragments (right) found in association with tumulus no. 155 in the Palmyrene, more specifically the northern parts of Jebel Abyad (cf. appendix 1). Although chronologically undiagnostic, these finds can be characterised as small personal ornaments similar to the material described by the Syro-Japanese project, indicating that many Palmyrene tumuli can be considered funerary (or otherwise, cf. 5.4.2) monuments erected by a mobile population.

### 4.7.4 The Syro-Italian project in the southwestern Palmyrene

Bonacossi and Iamoni (2012) described the results of surveys carried out by the Syro-Italian project in the region west and southwest of Palmyra, where they identified two *cultural horizons* defined by two archaeological structures – kites and tumuli (Bonacossi & Iamoni 2012, p. 35). Except for stone enclosures, which they did not describe, the team thus presented two of the three characteristic types defined by Zarins' pastoral nomadic technocomplex (cf. 4.1.1). Similarly to the Rawda survey, their study area bordered more or less directly onto the concession area for the Palmyrena project (**Figure 4.55**, area E), making their research, albeit in many cases provisional, highly relevant here. Their arguments on kites was discussed under 4.5.5.2 and will not be elaborated further here, but the project recorded a number of tumuli in the same area, in the mountains of Jebel Waariye, Jebel Taniyet el Khan, Jebel Tabaq, Jebel Lebtar, and the northern end and plain of Wadi Hallabat (Bonacossi & Iamoni 2012, p. 45, fig. 12). The general distribution pattern is similar to the regions north of Palmyra, with several clusters of four to five tumuli and a topographical focus on mountain ridges and less often on their slopes. However, they did also document a few clusters of tumuli on the lower plain, i.e. not elevated onto high ground for visibility, and stated that the reasoning behind this placement remains uncertain (Bonacossi & Iamoni, 2012, p. 46). The project concentrated on a small hill on the plain called Rujem al-Majdur (cf. **Figure 4.55**, within area E), where they recorded 55 archaeological structures of which 33 were characterised as tumuli, the others being interpreted as mainly graves and auxiliary structures related to the funerary complex. In addition, a small number of structures called *enclosures* have been noted on their distribution map, probably similar in type to the stone enclosures presented in 4.5.4, and associated with a similar topographical context (i.e. near the bottom of the hill slopes – cf. Bonacossi & Iamoni 2012, p. 47, fig. 14 – cf. 4.5.4.1). Surface scatter of pottery indicated a possible EBA date for the Rujem al-Majdur sites, and there were no settlements to find in the surrounding area (Bonacossi & Iamoni 2012, p. 44). The Syro-Italian project had the opportunity to excavate eight of the tumuli and a few other associated structures. This meant they could record internal structures, as well as the presence of any grave goods, skeletal material, or any remains of funerary activities *in situ*. They described three tumuli in detail, one large and circular (T221 - 10 m diameter) and two medium-sized and roughly trapezoidal (T213 and T302 – 5 and 6 m diameter respectively). These all seemed be comparable to the general shape, external construction, and certain internal features of burial monuments surveyed by the Palmyrena project, with both perimeter foundation blocks and central cists or chambers (cf. Bonacossi & Iamoni 2012, pp. 22-30, figs. 15-20), although the tumuli also had some unique individual features, e.g. the two upright marker stones associated with T221. The perimeter foundation of the largest tumulus, or external circle as it is called, has the shape of a low, dry-stone ring wall, whereas the area between this and the central cist was filled with irregularly placed stones and earth. A few Roman potsherds in the upper levels of this tumulus the excavators suggested were intrusive, and thus not associated with the time of construction. The tumulus T302 had remains of a defining stone-lined perimeter and rubble fill between this and the cist, while the smallest one, T213, did not have a perimeter foundation except in the lower parts of the structure. While T221 and T213 had been looted, possibly in antiquity, there was no apparent intrusion into T302, where the cist contained an ash layer with bone fragments. Two of these burial monuments also had auxiliary features like an associated semi-circular structure (T221) and a satellite grave (T213). The investigations carried out by the Syro-Italian project thus added more data to the corpus of information regarding central Syrian burial practices and provided yet again some indication of provisional dating. However, the main approach to chronological control seems to be based on the possibilities for excavation, with surveys only able to provide limited forms of dating. On the other hand, their work still seems to support a general pattern of EBA-MBA chronology for tumuli in the dry steppe highlands, although they stressed that there are problems with the lack of precision and an inherent fragility in the archaeological material from such sites, which hopefully can be solved through the acquisition of absolute dates (Bonacossi & Iamoni 2012, p. 52).

## 4.8 Summary and conclusions

The archaeological remains of the Palmyrene forming part of the mobile pastoralist technocomplex – that is tumuli, stone enclosures, and kites (cf. 4.1.1) – are extensively distributed across the region, but with notable differences and characteristics in landscape contexts. This has been shown by on-the-ground survey, and further substantiated and supported by investigations of satellite imagery on regional scale, which covered nearly 4000 km$^2$ and increased the data set of each structure type manyfold, to include over 8000 tumuli, nearly 2500 stone enclosures, and over 300 kites. The full analysis of all these archaeological monuments seems to affirm that tumuli overwhelmingly are directed toward communication lines locally, with placements topographically determined routes and along lofty mountain ridges suggesting an emphasis on perspective. Many tumuli, like the monumental cairns, were clearly meant to be seen from far away by people moving through the landscape, while some, like those here defined as mounds, were more directly associated with particular routes. A number of auxilliary features – such as platforms or stone rows – have been documented to be associated with both isolated tumuli and with clusters. These have been defined and analysed here to a degree, and although they are seemingly found throughout the surveyed area, it has not been possible to detect a particular distribution pattern among them. Finally, the regional distribution of tumuli show a significant drop-off in densities toward the northwest and the east-northeast and high concentrations in most of the central Palmyrene (cf. **Figure 4.29**). In general, apart from local focus on movement through the landscape, the highlands and wadi-valleys in between them are more *ubiquitously* and *consistently* distributed with tumuli in various archaeological contexts, suggesting a focus on the region *as a whole* (cf. **Figure 4.30**), rather than on overregional communication lines between the river valleys.

The other structures identified in the satellite surveys are associated with other patterns, but seem to show some consistency within the structure types themselves. Stone enclosures (cf. 4.5.4) are also ubiquitous, but situated in entirely different parts of the topography. They are found as isolated structures or clusters, and many seem to have an association with water run-off. However, their functional interpretation is not clear-cut, and a range of suggestions – human habitation, animal pens, or small-scale gardens – could, and in my mind *should*, be considered on a case-by-case basis. Even though they probably have been used for a variety of purposes for millennia, comparative evidence show that some have obviously also been constructed and used during the EBA IV. This is also the case with the many Palmyrene kites (cf. 4.5.5), which I suggest were mainly constructed for large-scale drives of wild animals, and used from at least the Chalcolithic until recent times. They vary significantly in shape and size, but contrary to the other two structure types, they are much more limited geographically (cf. **Figure 4.38**), and are clearly directed toward the seasonal migration of gazelle populations – specifically the one going from Al-Hamad to the Syrian plains.

Chronological control of the Palmyrene tumuli has proved difficult to obtain, with attempted OSL dating failing to produce results, and most of the pottery finds assembled during the survey being of tentative value, although some material seems be datable to EBA IV. However, a number of other projects working in the region (cf. 4.7) have indeed shown that very similar structures situated in archaeologically, topographically, and geographically comparable contexts are generally datable to the EBA IV and the MBA. In addition, in cases where it is possible to determine, they seem to be associated with a mobile population. Thus, it seems likely that many – if not most – of these monuments can be considered to have been constructed by mobile groups using or inhabiting the Palmyrene in the later 3$^{rd}$ and early 2$^{nd}$ millennium BCE. With this, I will now turn to the final aspect of this dissertation – mobile pastoralists in the Bronze Age Near East.

# 5 Near Eastern mobile pastoralism

A large corpus of literature has been published on the topic of Bronze Age societies and the relationship between mobile and sedentary groups and their tribal affiliations, with links extending back into the EBA in the Near East (e.g. Kupper 1957; 1959; Luke 1965; Matthews 1978; Porter 2000; 2012; and numerous other scholars). This material has usually been based mainly on the Mari texts (cf. 3.2.2), as well as numerous smaller archives (cf. 3.2.4), and our understanding has widened tremendously in the last decades, especially thanks to the extensive contributions emerging from the work carried out by the French Mari school under the direction of Charpin and Durand (Porter 2012, p. 26). Other noteworthy recent, but important studies in this area which, according to Porter (2012, p. 27, note 33), have yet to make the impact they should, are Heimpel (2003) and Fleming (2004). These scholars have provided new approaches to the study of mobile pastoralism and tribal groups during the Bronze Age, which have more or less revolutionised the contextual picture, and much of the content in this chapter is directly based upon their research and interpretations. It is far beyond the scope of this dissertation to complement or criticise these scholars on the specifics of sociological, ethnographical, linguistic, or historical terminology. I will rather merely apply their studies and arguments synthetically to the archaeological structures recorded in the Palmyrene, put these into a socio-historical context, and try to find an explanation for this particular expression of physical manifestation.

The chapter will start with a look at the mobile pastoralist world in the Near East in recent times (cf. 5.1), first with a presentation of earlier views on both the subsistence practice and on their structures of social organisation. Thereafter, I will present relevant definitions applied throughout this dissertation and discuss patterns specifically regarding Near Eastern mobile pastoralists in recent times – their subsistence base, their seasonal schedule, and how they relate to other groups. With recent practices as a backdrop, I will look at what both Bronze Age texts and archaeological research can tell us about ancient mobile pastoralist practices and organisation (cf. 5.2). Here the Mari archives in particular are essential for my interpretation, but the comparative element found in studies of recent mobile groups will also form a crucial part of the discussion. One of the key aspects for understanding EBA and MBA societies and structures seems to be the concept of tribal identity and kinship among the various groups of the Near East at the time, to which I will devote a substantial amount of consideration (cf. 5.3). Based on recent research (e.g. Wossink 2009; Porter 2012), I believe a number of misconceptions have been integrated with our perspective of tribal identity. I will therefore present current theories on this aspect, particularly by looking at the group called Amorrites (cf. 5.3.1), but also by considering how a reevaluation and reinterpretation of the Mari texts in light of tribal identity can provide a whole new perspective of the region and the interaction of its various groups (cf. 5.3.2 and 5.3.3). Through this, it is in my view possible to argue in favour of an integration of Palmyrene archaeological remains with a structural model which includes concepts of tribal territory and seasonal mobility (cf. 5.4), which in fact is supported by recent translations of ancient texts (cf. Durand 2005).

## 5.1 General patterns of mobility, pastoralism, and tribes

### 5.1.1 Earlier views on tribes and mobile pastoralism

Ancient Near Eastern mobile pastoralism has seen its share of scholarly dispute, both from earlier research and with regard to certain issues within the current debate, ranging from ethnographic notions like tribes and kinship, or nomads and pastoralism, to more contentious, and often outdated concepts, such as evolutionary determinism or the perceived conflict inherent in the term *the desert and the sown* (Bell 1908; e.g. cf. Wossink 2009, p. 128). Of course, the accumulation of information and resulting increase in complexity of the perspective makes a development from previously more simplistic views toward more composite ones unavoidable, but provides also in my opinion a clearer image of ancient societies – and this will of course continue as research and scholarly discussion moves forward in a structured, interdisciplinary, and inclusionary manner.

At the outset, it must be pointed out that any deterministic notions involving ancient mobile pastoralist populations to necessarily in time settle as agriculturalists or at least agro-pastoralists are in my view defunct. Earlier studies (e.g. Kupper 1957) often advocated such a stepwise development of Near Eastern mobile societies in the Bronze Age, and to some degree, this was still invoked in more current research, like Anbar (1991) and Streck (2000), although Streck himself later disassociated himself from this notion (cf. Streck 2002, p. 170). However, such deterministic post-nomadic sedentarisation was already in the works of Luke (1965, p. 19) and Matthews (1978, p. 21) more or less rejected in favour of a more nuanced perspective. It seems also to be the general consensus today among archaeologists working with themes on the Bronze Age Near East. Rather, such societies should be approached as very fluid, opportunistic, and adaptable to changing situations – environmental, economic, political etc. – enabling mobile pastoralist groups to shift to a more sedentary lifestyle if that is deemed advantageous, and sedentary populations could likewise become more mobile when necessary, as well as numerous other potential coping strategies found in ethnographic studies (cf. Fleming 2004, p. 224; Wossink 2009, pp. 34-35 – cf. 5.1.3.3). In other words, sociocultural change is repetitive and cyclical, with alternating phases (Fleming 2004, p. 224, after Salzman 1980, pp. 1, 4, 7 – also cf. 3.5). My own view is particularly influenced by scholars like Fleming (2004) and Porter (2000; 2012), and boils down to the post-processual approach where overgeneralised and stringent patterns of socioeconomic development often are seen as unsuitable for what is essentially a very wide and fluid horizon of human adaptations, which in addition should be contextualised within a cultural embedding.

#### *5.1.1.1 The Bedouin misconception*

Thus, there are a few aspects regarding pastoralism and mobility that I will clear out of the way in this subchapter, some of which have been generally accepted by most archaeologists working with this topic, but I still wish to point out here. The first point is the fact that mobile groups during the Bronze Age did not practice a lifestyle of pure nomadism (cf. 5.1.2). From the 19th century CE and continuing into early anthropological studies, analogies between such ancient societies and modern Bedouins were often the norm (cf. Luke 1965, p. 12). However, the practices and lifestyle of Bedouin groups are fully dependent on the domestication of the camel, with its high-carrying capacity, far-reaching range, and specialist potential in extremely arid environments (Bulliet 1990, p. 23; Rosen & Saidel 2010, pp. 72-73), and thus to view Bronze Age mobile pastoralists as similar to Bedouins would clearly be an anachronism (Khazanov 2009, p. 122). Incidentally, the term *Bedouin*, which often in French literature denotes nomads or mobile pastoralists in general (e.g. Durand 2004; Charpin 2004; also cf. Fleming 2004, p. 252, note 67), is here exclusively applied to mean Near Eastern mobile groups known from Classical and recent to modern times, usually associated with camel pastoralism. Other forms of mobile pastoralism – i.e. sheep- and goat-herding, including donkeys – require entirely different approaches based on a semi-mobile lifestyle following seasonal changes, which means that camels generally cannot be pastured with ovicaprines (Khazanov 1994, p. 55). The domestication of the camel, although still somewhat a matter of scholarly debate, is by most archaeologists thought to have occurred in the LBA and did probably not become widespread in the Near East until the Iron Age (e.g. Khazanov 1994, p. 100; 2009, p. 122; Rosen 2008, pp. 124-125; Rosen & Saidel 2010, pp. 75-76; also cf. Artzy 2007, pp. 134-135). In any case, it certainly did not constitute part of neither sedentary nor mobile husbandry at Mari. Therefore, EBA and MBA mobile pastoralist societies were most likely *not* far-ranging desert nomads, but rather seasonally mobile sheep- and goatherders taking advantage of the pasturage emerging in the steppe as a result of winter precipitation providing favourable conditions, and subsequently retreating to secure water sources in the river valleys during the hot and dry summer season (Joannès 1996, p. 327 – also cf. 5.1.3.2 and 5.2.1.2). This realisation also affects the now antiquated picture of waves of invading nomads originating in the Syro-Arabian Desert (e.g. cf. Zarins 1990, p. 33 on this aspect of research history), since riders on camelback during the EBA-MBA clearly would be an anachronism, and rather appear around a millennium later (Luke 1965, p. 12; Khazanov 2009, p. 122; Szuchman 2009, p. 2). In fact, during the Bronze Age, mobile groups did not use mounted warriors at all and lacked military superiority to sedentary populations, as later Bedouins possessed (Bar-Yosef & Khazanov 1992, p. 5; Khazanov 2009, p. 124). Kupper (1957) exchanged the wave-theory with a continuous pressure or *river* of mobile groups from the arid steppes or Arabian Desert. This hinged on the perceived view of perpetual conflict between mobile and sedentary groups, in which the former replaced the latter, became sedentarised, and the process subsequently repeated itself with yet another mobile group from a constant *mass of nomads* found in the arid regions, indeed often located to be the Palmyrene or Jebel Bishri. However, the model was challenged not long after its emergence on three points, namely on the already mentioned evolutionary determinism of nomadism preceeding sedentism, on nomadic-sedentary conflict as a false historical constant, and also that nomadic impact on the sedentary zone would be the prime mechanism of sociopolitical change in the Near East (Luke 1965, pp. 16-19). Additionally, and importantly, Luke (1965, p. 22) cautioned against the assumption that observed modern processes of sedentarisation, which often come as a result of a specific political situation, could be retrojected back into the Bronze Age.

#### *5.1.1.2 Reassessing earlier theories on the concept of tribe*

These are also key points in the second aspect, which has already been mentioned and concerns the earlier view of deterministic evolution of unavoidable sedentarisation of mobile pastoralists in a diachronic perspective. Likewise, the deterministic evolution of tribes into an apex of states is not seen as a fruitful approach in studies of the ancient Near East anymore, nor is the view of them as being intrinsically separate from Bronze Age states. Rowton (1973; 1974) in his series of influential articles on Bronze Age Near Eastern nomadic groups coined the enduring terms *enclosed nomadism* and *dimorphic society* to describe their relations to cities and states. The first term he applied to the societal structure in which full-time mobile tribal groups – so-called *integrated tribes* – acted as autonomous polities within a state, as opposed to e.g. camel herding Bedouins who in more recent times have acted outside it as virtually independent (Rowton 1974, pp. 2-3). The second term suggested a dualistic society of nomadic and sedentary populations interacting, but remaining separate, or as presented by the author himself:

*"(...) between tribe and state. The hallmark of dimorphic structure is an autonomous chiefdom centered on a town in tribal territory. From this base a local dynasty exerts a varying blend of rule and influence over the nomadic and sedentary tribes in the countryside. The population of the chiefdom includes both a nontribal and a tribal element"* (Rowton 1973, p. 202).

This view was seen as progressive in the 1970s and the following two decades, but the current consensus now is that the Bronze Age picture was even more complex, backed up by recent studies and analyses of the Mari archives (e.g. Fleming 2004; Charpin 2004). Thus, the lasting and influential analyses put forward by Rowton on the social and political situation of the so-called Amorrite period in the Near East (cf. 3.4.2), based particularly on the Mari archives, have recently been challenged on key issues. Fleming (2004, pp. 70-71) questioned the core of Rowton's analysis, stating that it was based on the misconception mentioned in the introduction of this chapter (the *hana*, cf. 5.2.1.1) and a problematic cross-cultural comparison. The assumption that tribes and the state, more specifically the MBA royal administration, were distinctly separate entities is a flawed one, at least in the case of Mari. He argued that its last king, Zimri-Lim, governed the Mari state as a fully integrated Sim'alite tribal kingdom (cf. 5.3.2.1), with his kinsmen being the primary base of power. Thus, the mobile groups were merely components of a tribe, the *binu Sim'al*, which he ruled as king, and sedentary Sim'alites and their settlements were likewise a part of the same tribe. The *dimorphic society* is therefore unsuitable as a model for the analysis of Bronze Age sociopolitical structures. Szuchman (2009, pp. 1-2) condoned this view, arguing that Rowton's model did not anticipate the great degree of interaction between sedentary urban and mobile pastoral sectors of society, as well as the integration of tribe and state. He also rejected the opposition between states and mobile groups and the *invading nomads* as myths, as did Porter (2004, p. 70; 2012, pp. 5-6) with regard to the city and the pastoralist as antithetical entities, arguing that they in fact had much in common operationally and organisationally, often sharing similar ends. Modern and ancient experience is the difference, i.e. we have reconstructed an understanding of what life would have been like if *we* had existed in the past.

*"'Tribe' and 'state' are both inappropriate frameworks, at least as we currently comprehend these words, to use in understanding the sociopolitical organization of the period from 4000 to 1500 BCE"* (Porter 2012, p. 6).

Porter (2000, pp. 422-423) actually suggested that the well-known Rowton term *enclosed nomadism* should rather be turned on its head based on his own description of the geopolitical structure during the EBA-MBA Near East, and rather be characterised as *enclosed urbanism* – settlements enclosed and surrounded by mobile pastoralist groups ranging around on the steppes in search of pasturage.

Lastly, I will clarify the use of the term *tribe* in this chapter, as it has a long history of use and abuse in social sciences through its association with theories of cultural evolution found in e.g. Sahlins (1961; 1968) and Service (1971), and as mentioned in the previous paragraph an organisation which often has been described as being in opposition to the state. However, tribes should be understood as cultural, economic, and political systems on a highly flexible, adaptive, and variable scale (Szuchman 2009, p. 4). While the use of the term *tribe* as an early evolutionary stage in the development of human societies or a less sophisticated type of society than the state (Porter 2012, p. 11) is here rejected as a characterising description, and follows the thorough theoretical discussion presented by Porter (2000, pp. 53-86), I still condone the arguments put forward by Fleming (2004, pp. 26-27). His definitions and use of *tribe* and *tribal confederacy* is signifying a population or group characterised by a particular ethnicon – e.g. *Sim'al* (cf. 5.3.2.1), *Rabbum* (cf. 5.3.2.2), or *Sutu* (cf. 5.3.3) – and practicing a social organisation based on descent and/or kinship, but should be employed without any preconceived notion of human societal evolution. *Heterarchical, communal,* and *corporate* are other important characteristics commonly associated with tribes as social systems in Near Eastern archaeology, mainly to describe the degree of power sharing across the group, rather than power residing with an individual or small group (e.g. Porter 2000; 2004; 2012; cf. Szuchman 2009, p. 4). This seems in my view to be a relatively fitting description of the societies we can discern in mainly the Mari archives, as evidenced in the seminal study carried out by Fleming (2004), but also other textual sources from the EBA and MBA.

### 5.1.2 Key definitions of pastoralism, mobility, and tribe

Having clarified the position on certain earlier perceived aspects, I will turn to the specifics in the current debate on these topics. Thus, this subchapter aims to clarify some terms relevant for the discussion on ancient mobile pastoralists – mainly the three terms *pastoralism*, *mobility/nomadism*, and *tribe*. These are common features in recent works (e.g. Cribb 1991; Porter 2000; 2012; Fleming 2004; Wossink 2009) and several major scholar working on this theme seem to have their own view on the finer points of definitions, usually on the basis of earlier work – e.g. Cribb (1991) and Fleming (2004) following Khazanov, a (justifiably) frequently referenced author on the issue (see below) – but also with some of their own newly developed models and terminologies (e.g. Porter 2000). I will here also put forward the main points regarding terminology presented by these researchers, so the consequent discussion on Bronze Age mobile pastoralists can be placed within a proper framework, as well as clear up some earlier misconceptions and generalisations regarding such societies. As will be seen, the main difference between the approaches is the weight which is given to either the mode of production or the extent of mobility, and there is often a conflation of both these aspects.

#### *5.1.2.1 Considerations on terminology regarding mobility and pastoralism*

The first two terms, *pastoralism* and *mobility/nomadism*, are in archeological and anthropological literature often conflated into the same terminological framework. Already in the early 1970s, Salzman (1972, p. 67) argued that these two must be kept separate, with the former being a form of food production based on animal husbandry, and the latter being merely a form of movement. He pointed out that pastoralism can be associated with the whole horizon of mobility, and some mobile strategies may have nothing to do with pastoralism. However, Khazanov (cf. 1984, pp. 16-24) integrated both, defining his four main points of *pastoral nomadism* as: 1) Pastoralism being the predominant economic activity; 2) a practice of perennial herd maintenance on a system of free-range grazing; 3) periodic mobility (opposed to migration) between or within specific grazing territories to facilitate the needs of the herds and the way of life; 4) participation in the mobile lifestyle of all or the majority of the population, i.e. not involving specialist herdsmen; and 5) production aimed at subsistence requirements, and not toward markets. He upheld these points 25 years later (cf. Khazanov 2009, pp. 119-120), adding that pastoral nomads could practice a small amount of occasional or opportunistic cultivation, but more significantly that 6) their social organisation is based on kinship, and for the Near East in particular on real or fictive segmentary systems and genealogies; and 7) they share certain cultural characteristics associated with their mobile way of life. However, he seems to have used nomadism and pastoral nomadism as interchangeable terms, thus in essence defining *nomadism* as a mode of food-production or an economic activity (Khazanov 1994, p. 16; also cf. Bar-Yosef & Khazanov 1992, p. 2). On this basis, Khazanov distinguished a number of specific forms within his definition of pastoral nomadism, definitions which as mentioned have formed the core for discussions of pastoralism in recent years. Common for all these types is the degree of which agriculture takes a part in the economy, interspersed with variations on mobility, usually according to season or environment. His variations range from no reliance on agriculture at all as *pastoral nomadism proper*, via supplementary or secondary agriculture in *semi-nomadic pastoralism*, to agriculture as the predominant economic activity in *semi-sedentary pastoralism* (also called *agro-pastoralism* – cf. Khazanov 2009, p. 119), but with temporally and spatially shorter seasonal pastoral migrations in relation to the two previous categories, and finally *sedentary animal husbandry*, which he argued in general is only practiced as a minor supplement to agriculture. In addition, Khazanov identified *herdsman husbandry*, which employs all-year specialist herders looking after the animals on pasture away from the settlements, and *transhumance* as a geographically and historically specific form, where livestock are driven by parts of the society to other ecological zones at certain times of the year, essentially being a vertically practiced form of herdsman husbandry (i.e. from the lowlands to mountain pastures). He explicitly noted also that its broad use with regard to pastoralism including seasonal use of other ecological niches in general is not wholly justifiable (Khazanov 1994, pp. 23-24).

Khazanov’s work was groundbreaking in its thoroughness in the early 1980s, but a few years prior to this, Matthews (1978, pp. 18-21) had applied a similar framework to his study of nomads in the Mari period based upon among others the works of Barth (1961), Bates (1971), and Salzman (1972). He described *transhumance*, *semi-nomads*, and *full nomads* as three forms of migratory pastoral activities, all of which descriptively more or less parallel the corresponding categories presented by Khazanov. He emphasised that semi-nomads and full nomads are in essence societies practicing sheep/goat and camel husbandry respectively (cf. 5.1.1.1), and the former type is the one which he would use to characterise mobile pastoralists of the Mari period. However, importantly he pointed out that members of the same tribe could practice transhumance, semi-nomadism, and sedentary agriculture, and as mentioned that there is no determinism in stepwise tribal progression from full nomadism to sedentary agriculture.

While Khazanov's work was mainly associated with anthropological and historical issues, Cribb (1991) focused on nomadic societies in archaeology specifically, although largely relying on middle-range theory between anthropology and material remains. He focused on giving weight to the ratio of pastoral vs. agricultural production practiced by societies, and not the extent of mobility (Cribb 1991, p. 15). Following this, he argued that most Near Eastern societies defined as nomadic should be placed in the category of *semi-nomadic pastoralism*. Cribb also presented an illustrative model structured along continuum formed by two axes – agriculture/pastoralism (also termed mode of subsistence) and sedentism/nomadism (i.e. degree of mobility) – constituting a horizon onto which all mobile pastoralist societies should be possible to position for analytical purposes (cf. Cribb 1991, pp. 16-17, and **Figure 5.1**).

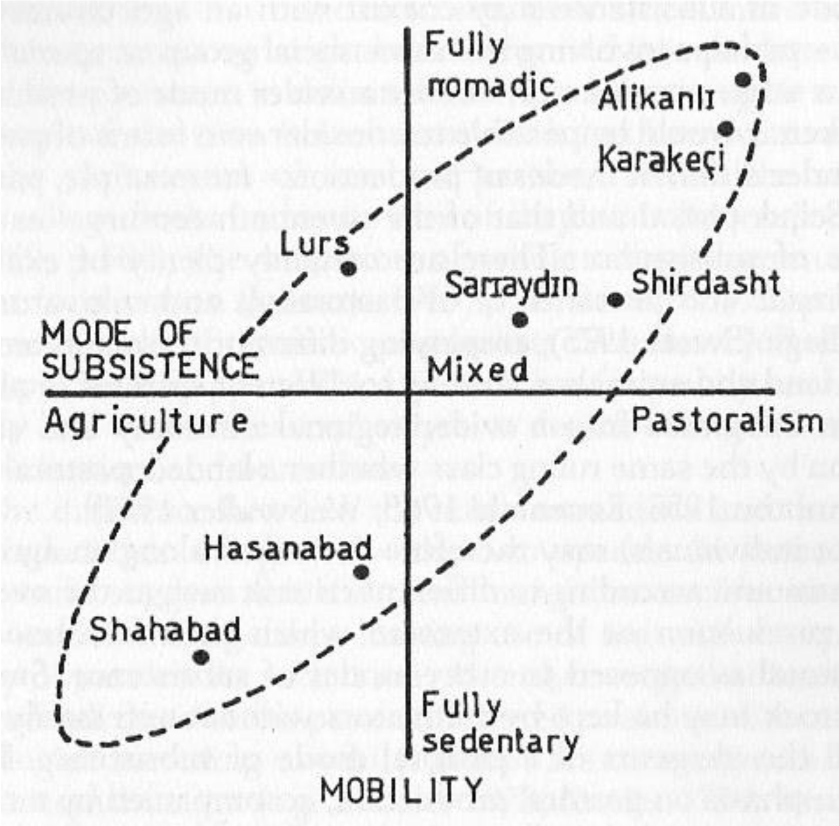



**Figure 5.1:** Model presented by Cribb (1991, p. 17) showing the wide horizon along which various current or recent Near Eastern groups operate with regard to agriculture/pastoralism (x-axis) and sedentarisation/mobility (y-axis). A tribe or group can be found for nearly every combination of these factors, and there seem to be no strictly dichotomised patterns of practiced lifestyles.

However, he did suggest that *transhumance* should be confined to a form of livestock management that follows seasonal variations in pasture, both on a vertical and horizontal scale, and can involve elements of nomadism if the population move with the herds, although he also stated that this is on a different scale to that of proper nomadism, presumably meaning that transhumance should be considered a less extensive form of mobile animal husbandry. In this he departs somewhat from Khazanov, including a variation of involvement by people, from specialised herders to seasonal migration or even the proper nomadic practice involving whole communities. Cribb crucially pointed out that *semi-nomadism* as a term has often been abused and is usually based on a misconception confusing the separate dimensions of *pastoralism* and *nomadism* (Cribb 1991, p. 19), a separation evident in his model. The terms nomadism and semi-nomadism refer to communal mobility, while pastoralism, transhumance, and herding are principally subsistence activities (also cf. Wossink 2009, p. 101). His specific definition of nomadism was:

*"(…) regular migration of a community together with much of its productive base within a single ecological niche. This may occur between different environmental zones or within a single zone"* (Cribb 1991, p. 20).

Both Streck (2002, p. 157) and Wossink (2009, p. 101) adhered to the definitions and salient points proposed by Cribb (1991), although Streck argued against the use of *migration* with regard to Near Eastern semi-nomadic pastoralism, as to him such a term implies a *"complete displacement of group or complete change of location"* (Streck 2002, p. 158), and thus not applicable to the routinised, seasonal mobility that has generally been practiced in the region. Fleming (2004, pp. 34-35) discussed briefly the Khazanov framework and followed it to a certain degree, stating that the Near Eastern (vs. more extensive Middle Eastern) manifestations of pastoralism are mainly variants of semi-nomadic pastoralism and herdsman husbandry, but on the two points he raised questions – the use of the term *nomad* and the assumption of scale in Khazanov's list (pt. 5), i.e. that production supposedly is not aimed toward markets. He also did not include transhumance in his discussion on Near Eastern pastoralism, thus following the arguments of Khazanov on that form being a geographical and historical specificity.

Variations on Cribb's and Khazanov's frameworks have emerged subsequently, although they have mainly followed the same terminological pattern, only differentiating themselves slightly and mainly being founded in anthropological studies. Abdi (2003, p. 398) distinguished between *mobile*, *transhumant*, and *nomadic* pastoralism as modes of pastoral subsistence – i.e. means of production based on animals – and followed mostly in the wake of Cribb. In his view, societies could practice both pastoral and agricultural means of production, and pastoral modes of subsistence can coexist with agricultural modes of subsistence in the same area. To him, *mobile* pastoralism involves movement beyond agricultural villages, but only in a distance of a few days walk, associated with his term *distant village-based herding*, where most of the population continues to lead a sedentary village life (Abdi 2003, p. 401). *Transhumant* pastoralism he described as a specialised form, involving seasonal movement between summer highland pastures and winter lowland pastures by often outsider specialists using campsites (Abdi 2003, pp. 398, 402), while the *nomadic* types – semi-nomadic and full-fledged nomadism – rely on high mobility and changing dwellings throughout most or all of the year, either along vertical or horizontal routes. Thus, here the focus turned to mobility once more. Seminomadic pastoralism usually follows two variants, with either 1) the whole group being occupied with both agriculture and pastoralism, or 2) some of the group are entirely or primarily occupied with pastoralism, while the rest practice agriculture, often along gender lines (i.e. men being out with the herds and women remaining in one place). His full-fledged type paralleled Khazanov's proper pastoral nomadism or alternatively the full nomads of Matthews, in that they excluded agricultural practice (Abdi 2003, pp. 398, 403-404).

In "The Archaeology of Mobility: Old World and New World Nomadism", Wendrich and Barnard (2008) opened the volume by synthesizing its contributions and attempting to put general terms relating to mobile groups from a variety of contexts and empirical, methodical, and theoretical studies into a framework for archaeological purposes, as well as to enable scholars to describe and communicate in a concise, albeit generalised, manner (Wendrich & Barnard 2008, p. 8). In the category of mobility strategies, they identified four types based on resource procurement (**Figure 5.2**, a-d), which they subsequently combined with pastoral (as opposed to mobile hunter-gatherer) modes of subsistence. These modes were based on the main framework of Khazanov, where pastoral nomadism is associated with **Figure 5.2**a, while both semi-nomadic and semi-sedentary (or agro-)pastoralism can follow both the models **Figure 5.2**b and **Figure 5.2**c. Wendrick and Barnard also described *tethered* nomadism, which is characterised by dependence on particular resources, other groups or landscape features, and therefore follows a mobility pattern similar to **Figure 5.2**d. Seasonal migrations with flocks depending on weather or resource availability they conceded could be associated with a number of terms, but the general one they called transhumance, vertically or horizontally according to topography, and associated with **Figure 5.2**b. Finally, they included the well-known concept from Rowton (1974) of enclosed nomadism, as well as *peripheral* nomadism – i.e. groups on the fringes of settled societies - as related to relations with other groups, and generally not to their mobility pattern (Wendrich & Barnard 2008, pp. 7-8).

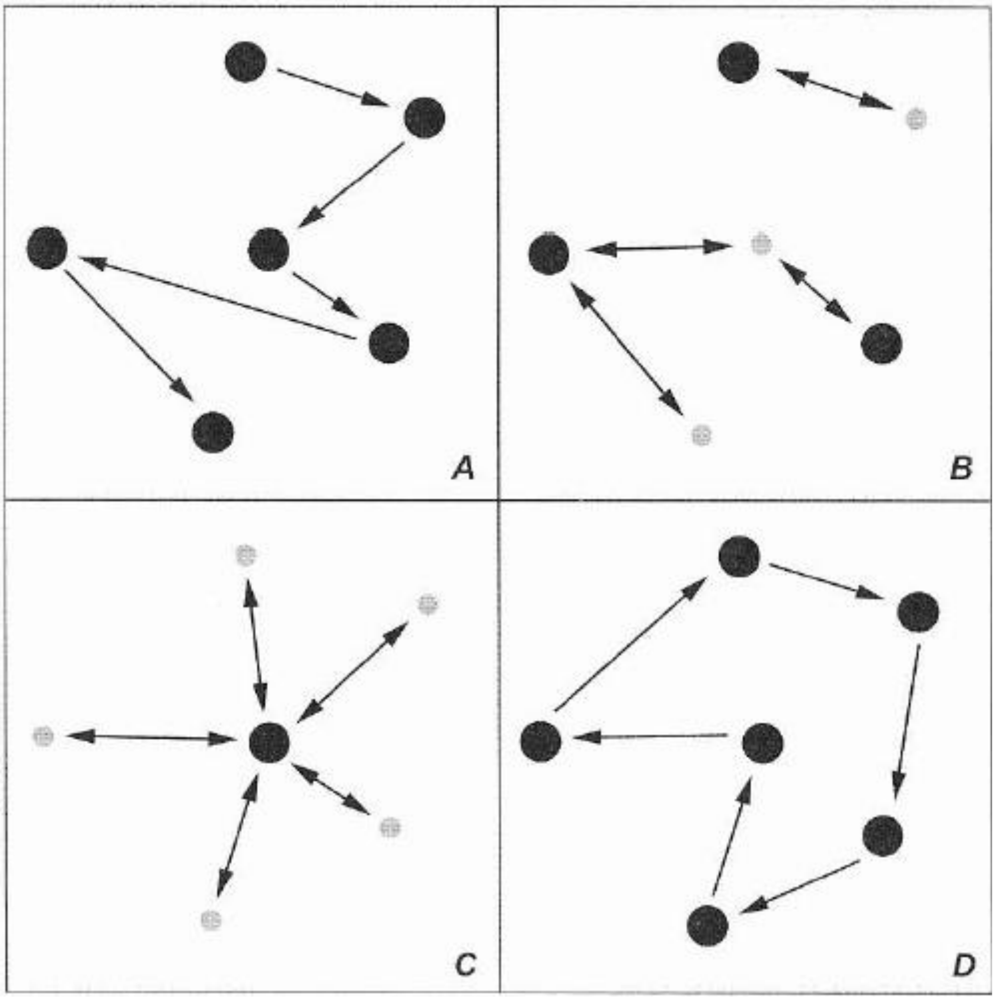



**Figure 5.2:** Model of four basic types of mobility, after Wendrich & Barnard (2008, p. 5, fig. 1.2): 1) Entire group travels from resource to resource; 2) segments of different groups travel to and from specific resource areas; 3) segments of the group gather resources from a base camp: 4) the entire group travels, following a distinct and fixed pattern.

However, not all scholars agree with the Khazanov framework. It has already been mentioned that Cribb (1991, p. 19) advocated a separation of the dimensions of pastoralism and mobility/nomadism. Porter (2000, pp. 16-17) has also rather strongly supported this approach, both to remove the element of mobility as well as to put *nomadism* itself to rest as a term. She argued that the latter has both in scholarly and popular literature been and still is associated with a number of aspects and attributes characterizing societies or groups practicing it, that might be prejudicial or even detrimental – e.g. antipathy to sedentary life, lack of complex social organisation, or even barbarism. It is very typical of her work (e.g. Porter 2000; 2002; 2007; 2012) to be acutely conscious of applying terms like *movement* and *mobility*, as opposed to migration and nomadism of earlier (and other contemporary) literature. The term *mobile pastoralism* is in her view defining a society by subsistence pursuits and how these are practiced, and thus *not* the organisation it is based upon, a generalisation which incidentally would be nigh impossible to establish considering the large variety of such societies. She pointed out that pastoralism in and of itself is an *agricultural* system in which people are practicing animal husbandry on primarily an economic, as well as often a social and cultural basis. Movement is not necessitated, although seasonal movements are frequently featuring among most pastoralists, especially in the Near East. Thus to alleviate for the removal of the mobility element from definitions of pastoralism, Porter (2000, pp. 28-30) suggested an alternative four-point definition based exclusively on mode of food-production. Her *pure pastoralism* corresponds to Khazanov's pastoral nomadism, with absent or extremely low amounts of agricultural production. *Supplemented pastoralism* involves subsistence based on livestock, but augmented by some agriculture. *Supplemented cultivation* describes a variety of farming practices where cultivation is the main form of production, but also includes some animal husbandry, such as in Khazanov's sedentary animal husbandry and presumably agropastoralism. Finally, she defined *pure cultivation* as an abstract state in Near Eastern contexts, where animal management is absent or economically insignificant. Even though Porter rejected generalised models of pastoralist societal organisation, she argued that one feature was typical of pastoralist societies – some form of communal access to territory and rights to its resources. Sedentary cultivators on the other hand she argued are more likely to be characterised by access or rights on an individuated basis (Porter 2000, pp. 30-31). Combining her framework of subsistence modes with the concept of people vs. land relationships, she suggested that pure and supplemented pastoralism are practices mainly associated with *undifferentiated* or *demarcated territoriality*, while the two other modes, supplemented and pure cultivation, take place within or express the concept of *appropriated land* (Porter 2000, pp. 40-41). Such structures of land or resource allocation are well-known ethnographically, as e.g. Barth (1961, p. 54) noted that none of the pastures belonging to the Basseri tribe were ownerless, but the ownership manifested itself as usufruct rights and not property rights to a tradition-based territory. Access to these rights was acquired through membership in an *oulad*, more or less the third-level tier in the hierarchy of their tribal organisation, following tribe and section (cf. **Figure 5.7**) – perhaps in structural terms comparable with the use of *clan* below (cf. 5.2.1.3 and 5.3.2.2). This is not merely of theoretical importance, but can possibly be applied fruitfully to archaeological studies where territory is discussed, and probably for the investigation of Bronze Age societies, groups, and funerary structures in the Palmyrene (cf. 5.3 and 5.4). These are the main lines of scholarly thought regarding variations within pastoralism and mobility.

In my view, the debate seems to follow disagreement on the finer points, although I do acknowledge a need for a common framework along the lines of what Wendrich and Barnard (2008) attempted. Unfortunately, the models suggested by Porter (2000; 2012) were not integrated there. The fluidity and variation of pastoralist societies make any categorical definitions rather futile. However, two general factors should be used to describe such groups – the degree of mobility and main mode of food production – and it might be prudent to clarify my approach for the sake of the subsequent discussion. I will, as many recent archaeologists working on the topic, keep using the term *mobile groups* over *nomads*, to emphasise the relativity of mobility and the interdependence and integration with sedentary components within the same tribal group (cf. 5.1.2.2), as opposed to their separation or any false or anachronistic dichotomy. The mobility element of a designation may be qualified by a lesser or greater degree, although as has been underlined above and will be argued later (cf. 5.1.3.2 and 5.2.1.2), perennial mobility in the dry steppe will not be considered part of the lifestyle of groups practicing ovicaprine herding in the EBA and MBA. However, I do not find the term *migration* particularly problematic, a term Streck (2002) questioned, if it is qualified by *seasonal*, which here will denote the annually routinised movements of people and their flocks in order to follow pasturage, as it were. I will abstain from using the term *transhumance* for ancient Near Eastern societies, following the argument put forward by Khazanov (1994), as well as the general inconsistency of its usage in the literature. In the case of specialised herders looking after flocks of e.g. the states, kings, or palaces, I find the term *herdsmen husbandry* perfectly adequate, although here it is not defined by necessarily perennial separation from the sedentary communities (cf. Khazanov 1994, p. 22), as well as that the practice was potentially being outsourced to mobile groups for the wet season anyway. I do adhere to the basis of Porter's terminology, in that all Near Eastern Bronze Age societies to varying degrees practiced *supplemented pastoralism* or *supplemented cultivation*, although not either extreme of these. Thus, mobile pastoralists will be considered as groups practicing mainly pastoralism, but also carrying out other subsistence activities, and their season of mobility is here thought to have occurred during winter and spring on the arid steppes of the Near East, incorporating Cribb's definition of nomadism cited above and following patterns like those described by Wendrich and Barnard (2008, p. 5 – cf. **Figure**

**5.2**). This is not *mobile* in the sense Abdi (2003) defined, but as Porter (2012) used the term. However, and this is crucial, all the modes of production and degrees of mobility qualified in this paragraph I believe could very well have been in operation within the same tribal group (see below), albeit not usually within the same household, somewhat along the lines of what Matthews (1978) suggested for the societies described in the Mari archives, although without his explicit terminology.

#### *5.1.2.2 Considerations on the concept of tribal organisation*

Porter (2000; 2012) deliberated extensively around concepts relating to tribes and kinship groups (also cf. 5.1.1.2), based on a thorough discussion of the changing meaning and usage of the terms *tribe* and *tribal* and their frequent association with pastoralist societies (cf. Porter 2000, pp. 53-80; 2012, pp. 44-54). I will contend myself here with referring to her discussion with regard to history of research and move straight to some of her main points. Two factors are commonly used to define what characterises tribal identity – territorial distribution and kinship via descent from a common ancestor, of which the latter may be fictive or real, ideological or actual (Porter 2000, p. 7). This latter concept was argued by Service to result in an egalitarian structuring of tribal societies, as all members are supposed to share this mythological ancestry (cf. Porter 2000, p. 64, with references). Like the evolutionary determinism of Sahlins, this notion was not shared by Porter. Neither did she find the characterisations presented by Fried (1975) very fruitful, labeling them too imprecise for usage (Porter 2000, pp. 69, 74). Giddens (1984, p. xxviii) viewed tribal societies as primitive, in fact interchanging the terms *primitive* and *tribal*, also something Porter (2000, pp. 78-79, 83-84) did not adhere to. Smith (1986, pp. 22-32; 1991, p. 21) argued that an ethnic community as an entity is characterised by a collective name, mythic common ancestry, shared historical memories, one or more cultural elements distinguishing it from surrounding groups, an association with a specific homeland, and a sense of solidarity across large parts of the population. To Porter (2000, p. 81), this corresponded rather closely to the general understanding of *tribe* as a term when used by anthropologists, although she pointed out that there are examples of tribes incorporating several ethnicities and *vice versa*. Thus, ethnic group and tribe as terms do not have to be synonymous (also cf. Barth 1961, p. 85). In order to arrive at a more fruitful point for investigating tribal societies in archaeology, she argued that the boundedness in many definitions, as well as evolutionism or a cultural or technological approach, should be left out to avoid connecting tribes with primitiveness

(Porter 2000, pp. 83, 90). Pastoralism is itself very often correlated with a tribal structure in anthropological and arhcaeological literature, a notion characterised by two contradictory approaches. Tapper (1990, pp. 54-56) believed it is due to perception, i.e. relationships between pastoralists and the state, and such groups and western scholarship, rather than reflecting reality. Cribb (1991, p. 54) on the other hand argued that pastoralism, nomadism, and tribalism form a package which counters the inherent instability in the subsistence system by offering a complex and flexible territorial system. However, according to Porter (2000, p. 91; 2012, pp. 44, 59), neither a political/cultural approach like Tapper's, nor a territorial one like Cribb's, should be used to find a causal link between pastoralism and tribal organisation – the latter is in fact a *social* organisation, based on idioms and practices of kinship and descent. She pointed out that as the tribe also exists among sedentary people with defined territorial borders, any deterministic correlation with mobile pastoralism must be invalid. As has been mentioned (cf. 5.1.1.2), the dichotomy of tribe and state as a heuristic device should be invalidated, again with there being no evolutionary relationship them. Tribe and state should in fact not be analyzed as similar categories, and an individual can obviously belong to both at the same time. Porter (2012, p. 61) actually introduced the term *ancestral group* for studies of ancient societies, approaching what people mean when they say tribe, but without using any of the language associated with that concept, brought on by decades of abuse or misuse of the terms *tribe* and *clan*. It encompasses groups on a level of extended families/households, all the way up to common descent from an original ancestor, and thus tribes, ethnic groups, and even to some extent nation-states have been defined by the same elements. Important to note is the notion that such groups may still be dispersed to diverse locations and/or across multiple polities, and they could practice various subsistence strategies. While I find Porter's term quite good, as it is both descriptive and relatively neutral with regard to unwanted scholarly baggage, so to speak, I will mainly continue to use the framework surrounding *tribe*, including clans, families, and households, following the arguments of Fleming (2004) mentioned above, as well as to simplify when discussing the socio-organisational conditions inferred from the Mari texts by the major scholars of the topic (cf. 5.2.1.3). It will therefore here be used as an abstract structural model with tribal confederacies at the apex, incorporating tribes, clans, families, and households in a hierarchically decreasing position respectively, but generally increasing in number (i.e. households being the most numerous, but also situated at the bottom of the model), similar to the model presented by Streck (2002,

p. 180, fig. 5) and descriptions of structural contexts of the Basseri described by Barth (1961, chapters II-IV), summarised in **Figure 5.7** (see below).

### 5.1.3 Environment, subsistence patterns and relationships

#### *5.1.3.1 The domesticated herds of Near Eastern pastoralists*

Pastoralism is often characterised as inherently unstable with regard to resource procurement, and therefore alleviated by the practice of a mobile lifestyle. There are three variables which balance and influence this subsistence mode – resource availability (vegetation and water), the number of livestock, and the size of the mobile population – all of which are oscillating variables (Khazanov 2009, p. 120). The form of mobile pastoralism practiced in the Near East in general is based on sheep and/or goats, two species which can – and often do – pasture together in the same ecological zone (Khazanov 1994, p. 27). In such instances, sheep graze on the seasonally available green vegetation, while goats are more versatile and get fodder by browsing on drier shrubbery and high-hanging leaves (Hole 2009, p. 264). Animal husbandry in the region today also include cattle and camels, but the latter is not relevant as a species when discussing pastoral societies in the EBA and MBA (cf. 5.1.1.1), while the former species, although clearly present and herded in significant numbers by Near Eastern societies in these periods (e.g. cf. Durand 2010, p. 261, note 30), has not commonly been pastured in the arid steppe zone, at least not in modern times. Even though the short-horned breed of Syrian cattle is relatively adapted to the arid environment of the Near East, some scholars have argued that cattle (Galvin 1987, p. 126) and even donkeys (Streck 2002, p. 171) often are restricted to the cultivated zone – also known along the Euphrates as the *zor* (e.g. cf. Pappi 2006, p. 242) – due to their higher consumption of water and fodder, compared to ovicaprines. On the other hand, cattle pastoralists in southern Jordan have been known to range up to 30 km in order to find grazing (cf. Prag 1985, p. 82), and in one text from the MBA, a governor of Qattunan on the middle Habur (cf. **Figure 3.7**) asks permission to send his oxen and donkeys out on the steppe with herders for pasture, or else they will lack for fodder (cf. Heimpel 2003, p. 449, text **27 112**). It seems fairly likely that donkeys were used for a variety of purposes in this period, also in drier regions such as the Jezire (e.g. Larsen 1976), but the actual riding of donkeys was in fact reserved for persons of high status or moral, to the point of being an idiom for reliable witnesses or messengers (as *rider of donkeys*, cf. Heimpel 2003, pp. 295-296, text **26 312**, 593). More generally, when used in the steppe, they acted as beasts of burden for merchant or military caravans (e.g. cf. Heimpel 2003, p. 297, text **26 314**, p.

303, text **26 324**). While it is still possible that a pastoral subsistence on the steppes included a limited amount of cattle husbandry in the EBA and MBA due to different climatic and environmental conditions – at least the latter regarding vegetation distribution and coverage (cf. 2.7.1, 2.7.2, and **Figure 2.18**) – the vast majority of textual sources focus on the herding of sheep and goats, supported by a large corpus of archaeological evidence from a number of sites in the region (cf. 5.1.4). Additionally, as has been discussed (cf. 2.5), climatic oscillations seem to have characterised the centuries on either side of 2000 BCE, with a severe arid spike occuring in mid-EBA IV. Therefore a discussion about mobile pastoralism in the Near East of this period should in all likelihood mainly concentrate on ovicaprines.

#### *5.1.3.2 Seasonality and Near Eastern tribal pasturages of recent times*

Sheep and goats are much better suited for pasturing in arid environment than other domesticates, but they still need to be watered every four to five days in cold weather, and during warm conditions they require water daily (Khazanov 2009, p. 123). Thus, while mobile pastoralists practicing sheep herding may annually move up to 100 km with their flocks, and even further when following horizontal patterns or under special circumstances (Prag 1985, p. 82), their grazing radius cannot exceed 30 km distance from a water source, be it river, intermittent stream, *sebha*, well, or cistern, a radius which during warm weather can easily halve (cf. Khazanov 2009, p. 123, with references – also cf. 2.1.2). While pastoralists have more flexible water needs than cultivators (Fleming 2004, p. 34) and therefore can turn to mobile strategies, water is still the overarching determining factor for them (Streck 2002, p. 158). An intimate knowledge of their allocated – by tradition, administration, or otherwise – territory for pasturing their flocks is therefore imperative for mobile pastoralist groups. Another determining factor which influences the practices and strategies of mobile pastoralists is seasonality, i.e. the way the natural world they inhabit changes with the seasons (cf. 2.2.1 and 2.2.2), and consequently impacts their potential for resource procurement in different regions and biomes (cf. 2.2.3). This is the main rationale behind the practice of mobility, although Barth (1961, p. 6) also observed how the migratory cycle in fact was necessary for the welfare of the herd itself. In particular, the breeding of sheep follows the seasons in a stringent pattern, and is to a large extent controlled by the herders to occur between July and September for Near Eastern flocks in recent history, so the lambs arrive between January and March (Cribb 1991, p. 29). Timing and schedule are critical – for instance considering the consequences noted under 2.2.1.2 of the severe conditions befalling

Syrian herds in 1959 – as lambing requires abundant green, herbaceous pasture (cf. **Figure 2.20**), which is most likely to be available in late winter and early spring (cf. 2.2.1.2 and 2.2.1.3). Goats are less dependent on the annual spring pasture, being browsers and better adapted to hot and arid conditions (Levy 1983, p. 19), and breeding of goats is also less likely to be under human control for the same reasons (Cribb 1991, p. 29). Near Eastern pastoralists traditionally therefore move from camps and/or settlements in the *zor* to the steppe plateaus and mountainous regions in wet seasons (Hole 2009, p. 264). At least during the 19th and early 20th century CE, these mobile patterns were aimed at tribally defined general areas in the steppes of the Near East (**Figure 5.3**), described in detail by von Oppenheim (1939), but also mentioned by Musil (1928, pp. 151-152) and Blunt (1879a, pp. 364-365, 378-384) during their travels. As will be discussed below (cf. 5.3.2 and 5.3.3), there are indications of similar forms of mobile patterns along tribal lines even in the MBA.

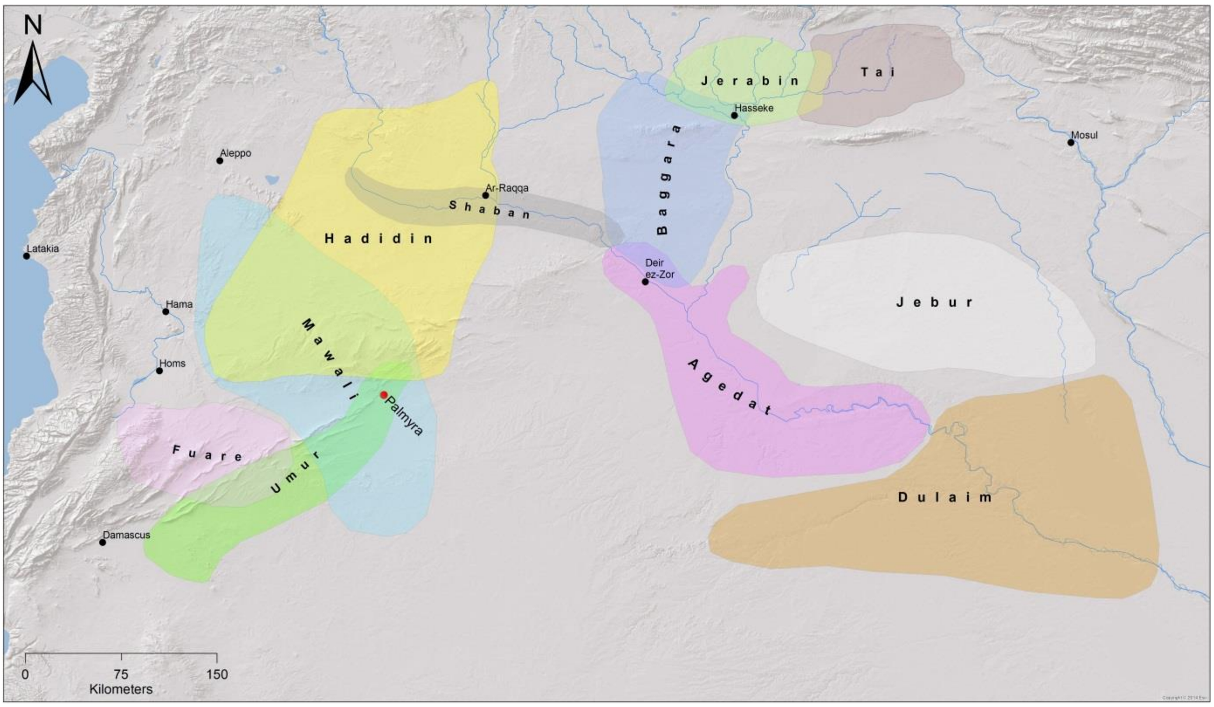



**Figure 5.3:** Map of pasture ranges and tribal territories of recent and modern tribes in Syria, clearly showing their designated areas in a geographical and topographical context (after Wirth 1971, pp. 268-269, map 11). Note that while most areas are more or less clearly allocated to one single tribe, the Palmyrene contain several overlapping territories of pasturage (i.e. belonging to the Hadidin, the Mawali, and to a lesser degree the Umur).

Wirth (1971, pp. 268-269, map 11; also cf. Postgate 1994, p. 5, fig. 1:3 for a simpler version) presented a complex map of such traditional pasturages used by various Near Eastern tribes on an annual basis (**Figure 5.3**), and others have also picked up on this aspect of mobile pastoralism and tribal territory, even to the point of carrying out comparative studies between modern mobility patterns and possible parallel MBA mobile pastoralist patterns (Streck 2002, p. 160). Of course, the map presented by Wirth also includes camel pastoralism to a large degree, as well as encompasses the entire Near East, and should be viewed accordingly, but some aspects could be fruitful to examine – even in a study of EBA and MBA mobile groups, particularly with the advantage of the extensive information found in the Mari archives. In general, Wirth (1971, pp. 256-257) described how the Syrian sheep-herding tribes varied in range between 50 and 200 km per year, and mainly kept their movements within the modern state borders. During the dry summer months (cf. 2.2.1.1) they pasture their animals in fallow and stubble fields in the zone receiving in excess of 200 mm precipitation or in areas with sufficient and stable water resources, while the winter months (cf. 2.2.1.2) are spent in the dry steppe and arid regions of central-eastern Syria, i.e. the Jezire steppe and mountain ranges, the Palmyrene, and other parts of the plateaus surrounding the river valleys. Incidentally, due to their hardier species of livestock, camel herders generally pasture their flocks further south in Al-Hamad and the northern Arabian desert in the winter months and in fact use the Syrian arid steppe biome as summer pasture (Wirth 1971, pp. 255-56). However, this practice is here deemed irrelevant for the EBA-MBA Palmyrene (cf. 5.1.1.1), which probably means that the environmental pressure on certain parts of the vegetation there, and possibly the Jezire, presumably therefore was lower than the case might have been in later periods. According to Wirth (1971, pp. 257-258), mobile groups practicing sheep and goat pastoralism in Syria begin their winter movements around November and remain in their grazing territories until May, when the dry season sets in, often signaled by the sinister *hamsin* or *samum* winds (**Figure 5.4** – also cf. 2.2.1.3), and they have to return to permanent water sources (e.g. McClellan 2004, p. 67).

**Figure 5.4:** Picture taken near the Palmyra museum of prevailing conditions during an early hamsin or samum wind. These can signal the onset of the dry season, and increase in frequency as the central Syrian springtime moves toward summer. The photo above was taken in mid-April 2011 (photo: Torbjørn Preus Schou, 2011).

The main Syrian tribes of recent times in this category (cf. Wirth 1971, pp. 257-258) are the Hadidin and Mawali, having their sedentary communities between Damascus and Aleppo, and their traditional pasturages in the arid steppe of the Palmyrene (cf. **Figure 5.3**). A group of tribes which until recently also followed such a pattern, but were mostly settled during the French mandate period were the Tai, the Agedat (see below), the Baggara (see below), the Jebur, and the Jerabin. They live in villages along the Euphrates and Habur valleys, and still claim ancestral grazing grounds based on strong tradition for pasturing their flocks, the territories of which are also shown in **Figure 5.3**. In fact, there are examples of groups having been driven from their sedentary lands and abandoned their settlements due to conflicts with other tribes still boldly returning to their ancestral pasturages with their flocks in spring, retaining their territorial rights of land and resource use, such as the Kurdish Kikkiehs (Prag 1985, p. 83). However, the degree of sedentarisation or shifts in mobility patterns for these tribes under the French mandate as well as generally during the 20th century in itself as a result of politics (e.g. Prag 1985, p. 83), while possibly a causal factor also in antiquity, make them unsuitable for direct analogies with ancient pastoralists, in addition to the general dangers of such comparisons. These tribes now practice a more partial form of mobile pastoralism, closer to herdsman husbandry, in that only some members of the families take part in seasonal mobility, thus not involving the whole community (Wirth 1971, p. 258 – cf. 5.1.2.1), but the topographical and organisational aspect of their movements may still be of interest here, if only to show the potential of integrating modes of production and degree of mobility with the environmental context.

Von Oppenheim (1939, pp. 217) writing three decades earlier described how the Agedat consisted of two tribal components, one fully sedentary, and one practicing mobile pastoralism about half the year, and living in settlements the other half. They traditionally had flocks grazing south of the Euphrates between Abu Kemal and ‘Ana, as well as in Jebel Bishri, a pattern which at least had been going on since the 18th century CE (Luke 1965, p. 28 – cf. **Figure 5.3**). Similarly, von Oppenheim (1939, pp. 39-40) characterised the Baggara as consisting of two components, leading partly mobile and partly sedentary lives, with pastures in Jebel Abd el-Aziz and in the Habur valley (cf. **Figure 5.3**). They conducted raids against adjacent tribes and Yezedis living in Jebel Sinjar in the early 20th century CE (Prag 1985, p. 83, with references). Another example with immediate relevance for the geographical context here, is the fact that pastoralists winter grazing their livestock in certain parts of the Palmyrene steppe during the last century returned to the Orontes valley for the summer season (McClellan 2004, p. 67). In fact, several recent mobile pastoralist groups have been said to practice modest cultivation in traditional mudbrick villages, as well as circulating on the steppes with their herds and living in tents in the rainy season (Lyonnet 2004, p. 27), and Bedouins in Jebel Bishri are known to cultivate small plots as part of their seasonal habitation in the dry steppe (Anfinset 2010, p. 90). Barth (1956, pp. 1083-1085) observed how Gujars in Pakistan also cultivated marginal fields as part of their seasonal pasture, and even seeded fields around their seasonal summer and winter camps for harvest the following year, although he also noted that the other, more specialised Gujar nomads never engaged in such agricultural pursuits. His study of the Basseri also suggested that a certain amount of grain cultivation regularly was part of their seasonal schedule, as the tribal groups planted when they arrived at the summer camp and harvested before they moved on (Barth 1961, p. 9). Streck (2002, pp. 159-160, 169) specifically tried to compare general geographical directions of EBA-MBA tribal mobility patterns inferred from the Mari texts to ethnographical work, e.g. that carried out by von Oppenheim. According to him, the Agedat were said to take the whole tribe with their sheep and goats onto the steppe plateau via traditional wells to their pasture territory in November, and stayed there until the grazing grounds were depleted in spring. Sheep were sheared in the period from late April to mid-May (**Figure 5.5**), whereafter the tribal groups returned to their summer residences in the Euphrates valley. The Baggara followed a similar pattern, albeit with a slightly earlier return to the river valley by parts of the mobile group to tend fields. The cultivation practices of both these tribal groups followed a seasonal pattern of sowing wheat and barley in the autumn, and harvesting in early (barley) to mid-summer (wheat) (**Figure 5.5**), which also was carried out by the semi-sedentary and sedentary components of the tribe. Their fields were irrigated by flooding contained fields first just after sowing, and then from early April until harvest. After harvesting, the fields could be cultivated with vegetables and sesame during the summer season (**Figure 5.5**).

| Month | Sept. | Okt. | Nov. | Des. | Jan. | Feb. | Mar. | Apr. | May | Jun. | Jul. | Aug. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Barley | ← P → | ←—— | S ——→ | I | | | | ←—— I | ——→ | ←—— H | ——→ | |
| Sesam | | | | | | | | | | ←—— | S | ←—— H |
| Flocks | | | ←—— | ——— | ——— | MP | ——— | ——— | ——→ | | | |

**Figure 5.5:** The seasonal schedule of many Near Eastern tribal groups, incorporating several forms of land use and maximising agricultural production (i.e. both cultivation and pastoralism). P = field preparation; S = sowing; I = irrigation; H = harvesting; MP = mobile pasturing (after Streck 2002, p. 171, abb. 2)

Such a schedule is also roughly found in texts from the MBA, where a governor of Qattunan on middle Habur mentioned the sesame season starting after the grain harvest (cf. Heimpel 2003, p. 425, text **27 38**). Late spring also coincided with severe, localised locust plagues from the steppe starting some days into the month of Malkanum, which is approximately May and the beginning of the dry season (cf. Heimpel 2003, p. 425, texts **27 26-34**; cf. Sasson 1985, p. 442 for the months at Mari). It is during this period that the pastoral flocks could feed on stubble, a common practice which carried with it the advantageous effect of nutritional manure for the fields (Barth 1961, p. 4; Khazanov 1994, p. 34; Streck 2002, p. 185). However, there are also examples of mobile pastoralists planting small fields in winter pastures, as small crops can produce well in confined areas (e.g. Hole 2009, p. 263). Thus, opportunistic cultivation strategies using specific installations along the route as part of the territorial pasture circulation could have provided a supplement to subsistence activities, and is as mentioned above not an unknown aspect among recent mobile pastoralists. This has been argued as one possible explanation for at least some of the stone enclosures found in enormous quantities in the Palmyrene (cf. 4.5.4.2). Although this prospect may seem implausible today in light of the environmental context, one has to keep in mind that the modern picture is a highly degraded one, and thus probably not representative with regard to a study of the Bronze Age. Additionally, certain topographical features make non-irrigated cultivation possible even in areas of lower than 200 mm precipitation. *Faydas* (cf. 2.1.2) and the widening of valley bottoms in particular accumulate deep and naturally-irrigated soil through water runoff, creating potential for agriculture near wadi confluences and around minor depressions in the arid steppe landscape (Salzman 1972, p. 65; Geyer & Calvet 2001, p. 57). While mobile pastoralists do not ordinarily initiate extensive programs of cultivation along their pastoral routes, they could still practice horticulture in advantageous situations as part of the annual mobility cycle by sowing crops that either is quick-producing or that require little or no care (Matthews 1978, p. 85). This has been observed by e.g. Spooner (1972, p. 128), who described how torrent floods and soil build-up in wadi bends in marginal environments would create potential cultivable fields which could be shored up or protected by dry stone walls, connected to a form of irrigation leat from higher up in the wadi, and planted with date palms, other fruit-bearing trees, vegetables, or even wheat. Indeed, opportunism and flexibility is often argued to be a characteristic feature of mobile groups, notwithstanding the general seasonal practices of pastoralism and cultivation, an aspect which is commonly termed *multi-resource strategies* (e.g. Szuchman 2008, p. 403 – **Figure 5.6**, also cf. **Figure 5.8**).

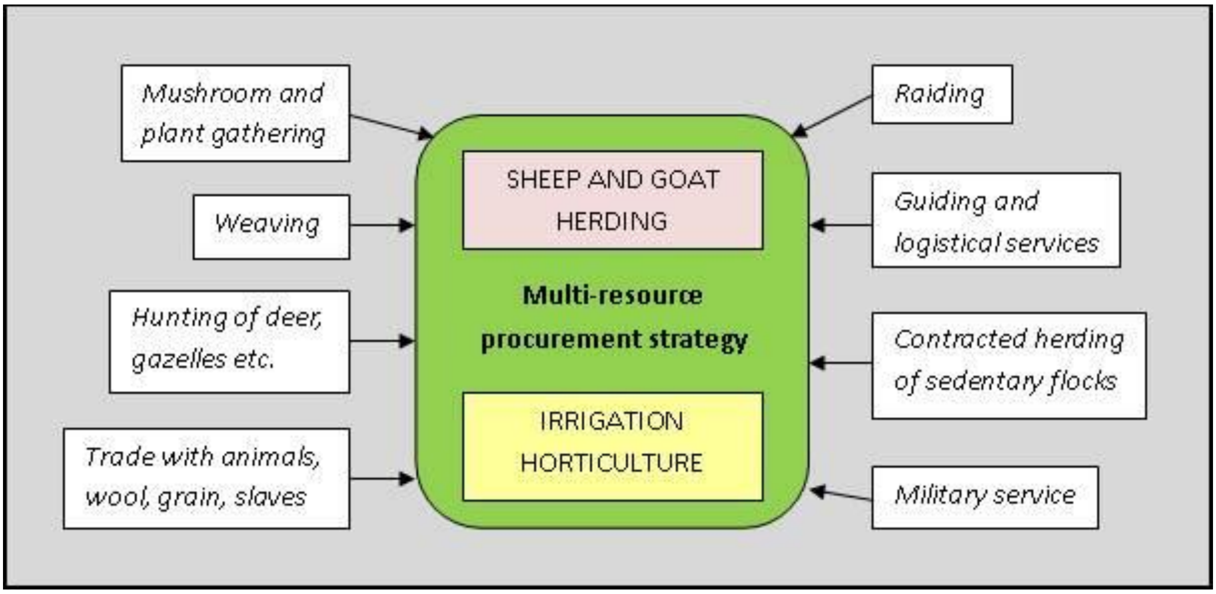



**Figure 5.6:** The myriad of economic activities commonly found to be part of the mobile pastoralist lifestyle in the Near East, also called multi-resource procurement strategies (after Streck 2002, p. 172, abb. 3).

#### *5.1.3.3 Coping mechanisms of mobile pastoralists*

In addition to the pastoral pursuit of tending their flocks, mobile pastoralists also lend their time and resources to hunt, gather plants and other wild crops, as well as occasionally actively carring out cultivation along their seasonal migration route (Spooner 1972, p. 124; Salzman , p. 66; Matthews 1978, p. 18). Other non-food-producing economic activities sometimes practiced by pastoral groups during the mobile part of their season are trading, smuggling, raiding, and the crafting of various objects (Szuchman 2009, p. 2). The key terms are *flexibility* and *opportunism*. It should be pointed out that the annual and seasonal pastoral movements carried out within tribal territories usually do not conform to a rigid framework, but are rather based on aspects such as resource availability, seasonal schedules, and allocated rights (e.g. Barth 1961, pp. 4-5; Matthews 1978, pp. 23-24). Mobile pastoralists must be free to travel as unrestrained as possible so they can focus on the food and water requirements for their flocks, which basically is dependent on the decisions of their herders due to the unpredictability of the environment. While groups may become identified with a general region, their prime concern is to move from one area of grazing to another within that region, i.e. their territory (Matthews 1978, pp. 23-24). No mobile pastoralists have patterns of absolute stability or instability, and established routes are not necessarily repeated annually, while unstable routes may coincide from one year to the next (Khazanov 1994, p. 38). Winter rains and the subsequent run-off can vary from year to year and place to place, affecting the availability and lushness of pasturages, potentially negatively or positively exacerbated by the amount of grazing during the previous year (Salzman 1972, p. 64). It is in fact due to the irregularity of regional precipitation that pastoral movements in the Near East are less stable than elsewhere (Khazanov 1994, p. 56), although there is usually regularity on one account, namely that the patterns are each year determined by the same set of seasonal factors (Spooner 1972, p. 124). However, presumably because pastoralism has been called a *zero-sum game*, meaning one herder’s gain is another’s loss due to the finite amount of grazing every year (cf. Cribb 1991, p. 38), annual pastoral movements generally take place within by tradition or otherwise allocated tribal territories, albeit as mentioned potentially varying within this from year to year. A common pattern is one of a large number of small camping groups from the same tribe, each deciding for and moving their own flocks around the territory, sometimes crossing paths, coinciding or travelling in opposite directions (Salzman 1972, p. 64). The Basseri in southwestern Iran were described to pasture flocks in bands of two to five herding units – tents, defined as the basic independent household of man, wife, and children – who united mainly for practical purposes of herding, when extreme dispersal was advantageous. However, the Basseri camps could be significantly larger (10-40 tents) in other parts of the pastoral year. This arrangement was seen as a partnership among equals irrelevant of kinship, with units free to establish other relations within their shared tribal section (Barth 1961, pp. 1, 21-22, 25-26). Another good reason for this pattern is e.g. the knowledge of water sources of less than obvious character, such as wells and cisterns (cf. text **3.4** and **3.5**). The sociopolitical potency of tradition and territorial rights is clear from e.g. the example mentioned above of the large Shammar tribe expelling the smaller Kikkieh tribe from their territory, and the latter still continuing to come back for their winter pasture.

Generally, among most mobile pastoralists, membership of a given tribal group bestows certain privileges, one of which being relatively equivalent access to the natural resources necessary for a pastoral mode of subsistence – mainly water and pasture – found in the territory belonging to that tribe (Porter 2004, p. 70; cf. Barth 1961, p. 55). This is particularly the case in areas of very low rainfall, where social rules regulate the practice and enable a fluid attachment to territory (cf. Porter 2000, p. 142, with references). However, this does not necessarily mean that the social and political organisation associated with mobile pastoralists is either egalitarian or lacks centralised power structures, although they frequently seem to practice some form of power-sharing as a decision-taking mechanism (Porter 2004, p. 70; cf. Barth 1961, p. 54). This is not particularly strange, since access to territorial pasturages by all mobile members leaves them all in the same boat, so to speak. The finite amount of resource availability (e.g. grass and shrubs, but potentially also water containers like cisterns) and the selective pressure on distribution of plant species can make overexploitation a real threat to the welfare of their flocks and the group itself. Pasture is never in pristine condition, as continuous grazing often results in a vegetation pattern unfavourable for pastoralism, with low diversity and high distribution of toxic species (Cribb 1991, pp. 27-28). The mobile community will have to carry the cost of overgrazing and depletion of pastures, which in areas of low rainfall, such as the arid steppe, can result in very slow recovery (Porter 2000, p. 24). When this occurs on a larger scale, it may be alleviated by two mechanisms: 1) increased degree of mobility, or 2) sedentarisation by parts of the mobile group (cf. Porter 2012, pp. 18; 22-23; cf. Barth 1961, pp. 108-109). Wossink (2010, p. 188) suggested a similar cause of action for ancient societies combating environmental stress, but seen from the side of sedentary cultivators, alleviated by either changing settlement pattern by nucleation into larger settlements, or reduction of the total sedentary population, i.e. turning to mobile strategies. In addition to environmental causes, political insecurity has also been known to lead to increased mobility. Other mechanisms which in recent times have been known to affect these processes are weak centralisation or stable geopolitical or societal conditions, where the former often leads to increased mobility, while under the latter conditions sedentarisation is more likely to occur (Cribb 1991, pp. 61-64).

#### *5.1.3.4 Socioeconomic relationships of mobile pastoralist groups*

This leads finally to the relationship mobile pastoralists often have with other subsistence groups and between each other. Four decades ago, views such as these ones were sometimes put forward:

*"Nomads and peasants hate and despise each other, and yet we know that nomads become peasants, and peasants become nomads"* (Spooner 1972, p. 126).

*"The pastoralist's relation to settled agriculturalists is like a happy marriage: the nomad can't stand the farmer, but can't live without him"* (Sahlins 1968, p. 35).

These quotes appear to be quite drastic statements, although there probably have been situations where one group of peasants some time in recent history has despised a neighbouring mobile group, and vice versa. However, as was suggested above (cf. 5.1.1.2) and will continue to be upheld in this chapter, the main boundary associated with low-level – i.e. not geopolitical – conflict and competition specifically in the Near Eastern Bronze Age world lay along tribal lines, and the general *nomad/peasant* mistrust known from later times should probably be rejected as an anachronism for the period in question. Coping mechanisms (cf. 5.1.3.3), such as turning to mobile strategies or settling down and practicing cultivation to a larger degree, probably occurred within the structural lines of family, clan, and/or tribe, and were therefore not likely to be subject to such hatred. Porter (2012, p. 13) argued that ancient Near Eastern pastoralists should be viewed as being part of the same social, political, and familial entity as neighbouring farmers, and merely splitting apart from time to time as the mobile season set in, or even as a series of single entities diachronically diverging and merging in a myriad of combinations. Indeed, she proposed that:

*"Pastoralists and farmers were more than symbiotically connected in the ancient Near East, for they were in fact integral components of the same social entities and political systems"* (Porter 2012, p. 24).

This was probably the case particularly in the Bronze Age, as there seems to have been both a mobile part and a sedentary part of all tribes (cf. 5.2.1.3 and 5.3.2). Additionally, their separation was essentially seasonal. Any dichotomy consisting of mobile pastoralists on one side and sedentary farmer on the other is thus most likely a mere theoretical construct or in some cases a political one arising from specific historical circumstances (Porter 2012, p. 3), as the pastoral mode of subsistence can coexist quite peacefully with an agricultural mode (Cribb 1991, p. 18). In fact, such a pattern of socioeconomic organisation was argued by Cribb (1991, pp. 25-26; also cf. Luke 1965, p. 26) to reflect a high degree of specialisation and interdependence within a single political and territorial unit, with pastoral and agricultural modes within the unit often being integrated on a number of levels, even on a basic one such as the household. The interdependence may even increase during hard times, like during droughts (Porter 2012, p. 22). Both ethnography and written sources seem to suggest that mobile pastoralist societies generally do not subsist wholly on their own products and need access to the sedentary world for grain or other agricultural products, which form an important part of their diet, and according to some scholars, also their material culture and a large part of their ideology (Luke 1964, p. 75; Khazanov 1994, p. 95; Khazanov 2009, p. 120; Bar-Yosef & Khazanov 1992, p. 5). Bread can actually often form the bulk of the diet of recent and modern pastoralists (Spooner 1972, p. 123). Agricultural and other goods are usually acquired in villages, towns, or cities by selling their surplus of plant and animal production, both from pastoral activities and from hunting and gathering, a practice which indeed is explicitly documented in textual sources from Mari (Streck 2002, p. 173 – also cf. **Figure 5.6** and **Figure 5.8**). The other main alternative open to mobile pastoralist groups for obtaining necessary products would be the traditional feat of strength and prestige – raiding. If their flocks are reduced due to disease, famine, drought, or predation, mobile groups frequently raid other pastoralists or sedentary settlements to recoup losses and build personal status (Matthews 1978, p. 104), as well as acquire other goods. However, at least in the MBA this activity has seemingly nothing to do with mobile/sedentary competition or conflict, but was directed toward other tribal groups (cf. 5.2.1.4, text **5.10**, and text **5.21**). There is even often a custom in effect among societies practicing raiding as a procurement mechanism, whereby attempts on closely related tribes are prohibited and severe restrictions on the taking of human lives are in effect (Luke 1965, pp. 25-26). In addition, mobile pastoralists would still require an outlet for their own production, suggesting that indiscriminate attacks on sedentary settlements to acquire goods in general would be quite disadvantageous for them (Porter 2012, p. 20). While ethnographical studies suggest that there are lower levels of conflict between mobile pastoralists than between villagers (Cribb 1991, p. 45), there are certainly also examples of conflict in inter-pastoral relations as well, although in this context and subsequent discussion conflict or competition does not necessarily imply outright hostility (Porter 2000, p. 14).

These are the main lines of subsistence patterns of recent mobile pastoralists in the Near East, seen in light of their mode of production, their lifestyle, and their relation to the environmental context they inhabit. It is clear that a wide horizon of approaches exists between various groups, but certain generalisations have been possible to discern. In previous subchapters, I have alluded to certain references which inform us on the situation in the Bronze Age, mainly the MBA, and will now turn the attention more directly to this topic – general patterns of EBA-MBA mobile pastoralism – before turning to specific patterns (5.3.1, 5.3.2, and 5.3.3). However, inevitably certain topics will also require an integration of specific and general aspects.

## 5.2 Bronze Age mobile pastoralist patterns

### 5.2.1 Mobile pastoralists in the EBA and MBA: The textual sources

Due to the low intensity of archaeological research on ancient mobile pastoralist groups prior to the 1990s, and the many methological problems associated with this (cf. e.g. Anfinset 2010, pp. 88-92), it could have been really difficult to integrate the previous subchapters with knowledge surrounding EBA and MBA mobile populations and their practices. Fortunately, the small window containing an immense wealth of information that are the Mari archives (cf. 3.2.2 and 3.4.2) have provided scholars working within this field with a golden opportunity. Additionally, small historical glimpses discerned from other sites in the Near East dating to the 3$^{rd}$ and early 2$^{nd}$ millennium BCE do not seem to present a picture of a very divergent character to that from Mari. In fact, when seen in light of the Mari texts and interpreted within that context, it is possible to argue that the situation and social, demographical, and economical conditions surrounding 18th century BCE Mari are likely to be similar to those in the preceeding period, i.e. EBA IV. Porter suggested taking such a position when she argued that the detailed picture emerging from the Mari texts may

*"(...) when fully contextualised, be illustrative of similar relationships in evidence across the land of the four riverbanks* [i.e. the banks of the Euphrates and the Tigris, or indeed the Near East between Orontes and the Zagros mountains] *from the fourth to mid-second millennium BCE, in periods for which there are far less detailed information available"* (Porter 2012, p. 30 – my clarifications in brackets).

It might seem convenient, but I also adhere to this view. There is no reason to believe that socioeconomic patterns should have shifted significantly from the late EBA to the early MBA, although the climatically wetter phases of early to mid-3rd millennium BCE may have had an effect on the potential for certain strategies and practices of Near Eastern populations. However, the widespread and regional "collapse" of societies sometimes associated with the EBA-MBA transition (e.g. cf. Akkermans & Schwartz 2003, pp. 282-284) may have been of a less dramatic character than previously believed (e.g. Meijer 2007, pp. 41-42 – also cf. 5.3.1), and archaeological periodisations are of course heuristical constructs. I will mainly continue to apply the Mari texts when integrating ancient Palmyrene mobile groups with general contexts regarding mobile pastoralism as described above, acknowledging that history-specific details regarding the geopolitical situation doubtlessly varied (cf. 3.4.2). Most of the content here derive from the work of Fleming (2004) and the English translation of a large corpus of Mari texts by Heimpel (2003), both of course owing much of their research to the extensive work carried out by Charpin and Durand, as well as the most recent study by Porter (2012).

#### *5.2.1.1 Ancient designations of mobile groups*

The Mari archives show pastoralist groups being very much part of and bound up in the polities and politics of the 18th century BCE, and should be seen as neither independent nor state-controlled in the late EBA and early MBA (Porter 2012, p. 240). One of the truly great realisations in Mari studies, at least with regard to this dissertation, is the fact that the group called the *Hana* or Haneans (Akk. *ha-nu-ú* or *hanum*, hereafter simplified as *hana* to distinguish it from proper names of tribes), frequently attested in the texts and previously thought to be a tribe like the Yamina or Sim'al (cf. 5.3.2), is now actually agreed upon to mainly signify mobile pastoralists in general (Heimpel 2003, p. 582; Fleming 2004, p. 46). The term also appears in the AKL (cf. 3.1.1) as one of the eponymous ancestor kings dwelling in tents (cf. 5.3.1), although probably included in the time of Šamši-Addu (Heimpel 2003, p. 35). Gelb (1961, p. 37) believed that the term had evolved from a specific tribal designation into a generic term for mobile pastoralists from a specific ethnic term, while Charpin and Durand (1986) initially thought it designated a supratribal unit, that is above the level of Yamina and Sim'al, but later revised this to the current consensus, i.e. no association with ethnicity or tribal identity (cf. Luke 1965, p. 152; Heimpel 2003, p. 34). Heimpel argued that both of the original connotations should be upheld, and suggested three meanings of the term: 1) Signifying an ancestral tribal unit from which the four main tribes of the MBA Near East (Yamina, Sim'al, Numha, and Yamutbal – cf. 5.3.2) considered themselves to be descended, possibly used in ancient texts in the same way as modern scholars use Amorrite (cf. 5.3.1); 2) mobile pastoralists of any tribal identity; 3) specifically for Mari, the mobile component of the Sim'al tribe. *Hana* as a word has been described as deriving from *hanu*, meaning "one who lives in a tent", although it has also been argued to merely mean "to camp" in general, without any additional association with tents (cf. Heimpel 2003, pp. 35-36; Fleming 2004, pp. 46-47). Luke (1965, p. 142) mentioned that the term *hanum* in the Mari texts also could mean "to cause to graze" or "to fatten (sheep)". In any case, the arguments do seem to come nicely together to suggest that *hana* in most cases referred to mobile pastoralists in texts from MBA Near East, although when seen from the perspective of the writer, *hana* often referred specifically to the mobile component within the Mari sphere of influence. However, it is clear that the term was used by the many groups associated with other tribes situated explicitly outside the Mari kingdom for their own mobile populations, e.g. Yamina *hana* and possibly also an example of Yamutbal *hana* (Heimpel 2003, p. 35; Fleming 2004, pp. 48, 150). Another term encountered in the texts within the same sphere, i.e. signifying a distinct group of people, is *hibrum*[22]. It was employed by scribes to designate non-Sim'al mobile pastoralists

[22]Although they may stem from the same root word, this should not be confused with the Akkadian term *habiru* (also written as Amorrite *'apiru*) (cf. Sharrer 2002, p. 298), which was used throughout the Near East – mainly found in LBA texts, but also appearing in the Mari archives (Luke 1965, p. 272; Matthews 1978, pp. 159-162; Fleming 1998, p. 74). In the later period *habiru* was used to describe an element of the population living as runaways or exiles for various reasons, or even as brigands, living on the lawless margins of society (e.g. Kuhrt 1995, p. 230). Alternatively, it could designate people in a transitory state between territory and tribe, not belonging to the officially accepted groups, but with an aim to join the clan or family nexus of the village (Buccellati 1990, p. 235; 2008, pp. 150-151). In earlier usage – e.g. at MBA Mari – *habiru* had a more neutral

when seen from the Mari perspective, in a similar manner to the use of *hana* for their own mobile component (Fleming 2004, pp. 31, 49, 99). Matthews (1978, p. 65) argued that *hibrum* was signifying the mobile families of a tribal group, and Whiting (1995, p. 1239) described *hibrum* as "transhumant people" in his short list of Amorrite words in the Akkadian language (cf. **Table 5.1**). It has been suggested to have derived from the verb *habarum* meaning "to leave one's house", and contrasted with the term *sabum*, which signified a settled population (cf. Fleming 2004, p. 97). Thus, the term was associated with departure from home, but collectively, as mobile pastoralist groups in relation to their sedentary tribal kinsmen. Two texts show their association with the steppe:

**Text 5.1:** Another thing. Uranum and the elders of Dabiš came, saying "By extraction, we are among the Yahrurû, but never (as) yarradum; also, in the back country [i.e. the steppe], we have neither hibrum nor kadum [uncertain term, possibly some type of mobile group leader, cf. **Table 5.1**]" (…) (Fleming 2004, p. 63).

The other is a report from the time of Yasmah-Addu, where a queen is escorted to Qatna with the aid of men from villages and "*hibrum* of the steppe" (Fleming 2004, p. 98). Thus, in general, when the texts from Mari refer to mobile groups of Sim'al tribal identity, the term *hana* is used, while the mobile groups associated with tribes like Yamina, Yamutbal, or Sutu are by the Mari authorities referred to as *hibrum*, but likewise linked to subsistence practices in the steppe.

Two other ethnonyms which are often encountered in texts from the EBA and LBA respectively, but which actually may have been used by scribes in those specific periods and in certain areas of the Near East to signify mobile pastoralists in general, are Amorrites (Akk. *amurru*, Sum. *Mardu* – cf. 5.3.1) and Suteans (Akk. *sutu* – cf. 5.3.3). The Amorrite identity was during MBA an almost pan-Near Eastern framework of kinship and culture, but when found in texts from EBA IV written in southern Mesopotamia it has been suggested that the meaning could have been closer to how *hana* was used as a term at Mari some centuries later, i.e. without designation of ethnicity, political affiliation, occupation, or origins, merely meaning "our mobile groups" generically (Porter 2012, pp. 305, 320 – cf. 5.3.1.3). Similarly, texts from LBA occasionally mention the *sutu* (cf. Kuhrt 1995, p. 320), which there in some ways seem to carry an association comparable to that of *mardu* in late EBA and *hana/hibrum* in the MBA. Although fairly tentative, it seems at least possible that this term, which in the

connotation, merely indicating a man who had "left home", although the reasons could have also been of a sinister nature (Fleming 1998, p. 74; but cf. also Wossink 2013, p. 265).

Mari period was signifying a distinct tribe – the Suteans (cf. 5.3.3) – went through a semantic change as the centuries moved on, and became a generic term for mobile populations in the steppe in the LBA, an explanation along similar lines to the original one by Gelb (1961) regarding the *hana*. Heltzer (1981, pp. 84-85) did suggest such development, but in a Hittite military context, where the term *sutu* was initially associated with a tribal identity, which after some time shifted to merely signify mobile troops in general[23]. Unfortunately, the limited amount of evidence from these periods compared to the time of the Mari archives makes it difficult to conclude one way or the other, but such semantic development is a tantalizing idea. However, on the north Syrian plain itself during the EBA, the term for mobile pastoralists may have been a different one. The Ebla archives (cf. 3.2.3) contain the word *kammu*, which according to Porter (2012, p. 234) had a meaning associated with family, but actually referred to some form of institutional group situated in rural areas in various parts of the Ebla polity. These were associated with mobility and given certain tasks, like transporting goods, inspecting and maintaining water systems, performing military functions, and provided with grain rations when near the city. They were always the *kammu* of someone or somewhere, and both specific people and other political entities had *kammu* associated with them, a situation very similar to that of the *hana* six centuries later (Porter 2012, p. 239; for the various tasks given the *hana* in Mari texts, cf. Heimpel 2003, pp. 582-583). To summarise, mobile pastoralist groups are attested in textual sources of the Near East at least from the EBA IV and onward, and probably even longer (cf. 5.3.1). If the terms associated with them – *kammu*, *amurru*, *hana*, *hibrum*, and possibly *sutu* - are interpreted in a context similar to the Mari archives, taking time, place, and perspective into consideration, they were actually never situated outside the sedentary world as alien or hostile groups, but rather linked to respective sedentary settlements in a context of tribal kinship. This is made even more likely by their apparent way of life and subsistence practice – seasonal mobility for pasturage. As Luke (1965, p. 173, note 42) argued half a century ago, the view of ancient Near Eastern mobile pastoralist groups wandering aimlessly in the steppe looking for pasture is untenable. Just like

[23] Although Heltzer may have had some basis for this particular hypothesis, many of his other interpretations surrounding the group known in the Mari texts as Suteans are based on a misconception of the tribe Rabbum being of Sutean stock, which is generally rejected in acknowledgement of this tribe’s clear affiliation with the Yamina confederacy (cf. e.g. Heimpel 2003, p. 15; Fleming 2004, p. 45; Durand 2004, p. 158, as well as many others).

recent or modern groups, tribes in the early 2nd millennium BCE also had their traditionally defined territorial pasturages, some of which may roughly be discerned (cf. 5.3.2 and 5.3.3).

### *5.2.1.2 Ancient designations regarding pastoralist lifestyles*

A number of words are known from the Mari texts which are explicitly associated with mobile pastoralism, from descriptions of their practices to specific officials functioning as middlemen between mobile groups and the royal administration. Words that can be directly associated with pastoralist practices, in addition to those mentioned above, are shown in **Table 5.1**. It has in fact been argued that many of them were Amorrite in origin, gradually forming part of the Akkadian vocabulary (cf. 3.2.6). There are also many words associated with sheep-breeding, suggesting a truly specialised pastoral economy during the MBA, from *rakkabu* (breeding sheep), *salmu* (black sheep), and *buqunu* (plucked sheep), to very particular qualities like *isi(i)n ilu* (sheep to be eaten at the festival of the gods). At least 182 such separate words for various designations of sheep are known, in addition to 10 for ewes, 46 for goats, 21 for lambs, as well as 52 for oxen, 6 for sows, 13 for calves, and 28 for donkeys (Matthews 1978, p. 49). Evidently, sheep rearing constituted a major part of the Bronze Age Near Eastern economy and clearly made out the bulk of the total production based on domesticated animals.

| **Amorrite/West Semitic** term | **Translation** and/or **description** | **References**<br>(separated by semicolons when description varies) |
|---|---|---|
| *guzalum* | Herder, presumably a person or occupation, as opposed to a group, possibly as part of a herdsman husbandry practice (cf. 5.1.2) | Heimpel 2003, p. 584 |
| *hasiratum* | Enclosure for sheep;<br>Sheepfold;<br>Camp | Whiting 1995, p. 1239;<br>Luke 1965, p. 77;<br>Matthews 1978, p. 52 |

| | | |
|---|---|---|
| *hayatum/hallatum* | Encampment, including both people and livestock;<br><br>Herd on pasturage | Fleming 2004, p. 310;<br><br>Whiting 1995, p. 1239 |
| *kadum* | Possibly some form of leader within a Yaminite mobile group (*hibrum*) | Fleming 2004, p. 311 |
| *merhum* | Chief of pasture, high-ranking middleman between the *hana* and the royal administration | Fleming 2004, p. 312<br><br>Heimpel 2003, p. 590 |
| *miksum* | Customs tax levied at Mari, e.g. for passing through with flocks or goods or for selling these in the city, usually paid in sheep by mobile groups | Streck 2002, p. 174 |
| *nawum* | Steppe or backcountry, but also the flocks or pastoral community of the steppe, the pastoral domain;<br><br>Mobile encampment of people and herds;<br><br>Collective noun for the people, animals and camp associated with mobile pastoralism;<br><br>The flocks of the *hana* | Fleming 2004, p. 312;<br><br>Whiting 1995, p. 1239;<br><br>Matthews 1978, p. 59;<br><br>Durand 2004, p. 153 |
| *nighum* | Traditional tribal territories covered by the mobile pastoralists on the move, i.e. the pastoral range;<br><br>Direct meaning: "Territory in which to search for pasture" | Fleming 2004, p. 312<br><br>Whiting 1995, p. 1239;<br><br>Durand 2004, p. 118-120 |
| *re'um* | Shepherd, presumably a figure tending a flock of sheep, mobile or not | Heimpel 2003, p. 595 |

| | | |
|---|---|---|
| *rubsatum* | Sheds;<br><br>Pens | Luke 1965, p. 77;<br><br>Matthews 1978, p. 52 |
| *sugagum* | Leader of settlements or smaller mobile units within a large horizon of variation;<br><br>Mayor of town, village, or mobile group;<br><br>Position of authority over tribal groups, admininstered by the government | Fleming 2004, p. 313;<br><br>Heimpel 2003, p. 587;<br><br>Luke 1965, p. 166 |

**Table 5.1:** Terms from the MBA associated with practices of mobility and/or pastoralism to varying degrees.

Textual sources show that the steppe pastures blooming after the winter rains did not belong to whoever arrived there first, but were part of a traditionally structured framework based on tribal territories, in a manner very similar to the pattern of recent times (cf. 5.1.3.2). One text sent by a *merhum* to the king of Mari in particular shows this to be the case (cf. **Figure 3.7** for toponyms):

**Text 5.2:** While the land of Yamhad [the extended region around Aleppo], the land of Qatna [the region surrounding modern Homs], and the land of Amurrum [probably an area in western Syria between these two great powers, and stretching from the coast and possibly into the westernmost part of the Palmyrene] are the *nighum* of the Yaminites – and in each of those lands the Yaminites have their full of barley and pasture their flocks – from the dawn of time, the *nighum* of the *hana* [i.e. Sim'alite mobile pastoralist groups] has been the Ida-Maraš [generally the Habur triangle] (cf. Durand 2004, p. 121; Fleming 2004, p. 29 – my clarifications in brackets).

The term used to legitimise these claims was *ištu darkatim*, which meant "since forever", a common way in such a context of putting weight to them by asserting a notion of antiquity (Durand 2004, p. 122). Text **5.2** relates to the pasture ranges, or *nighum*, of the large tribal confederacy of Yamina and that of the Sim'al, although the other main tribal groups mentioned in the Mari archives undoubtedly had their own seasonal pasture territories as well (cf. 5.3.2, 5.3.3, and **Figure 5.12**). However, conflicts could arise in bordering territories. The Yamutbal and Sim'al seem to have shared some pasturages and water sources in the area around ancient Qattunan, i.e. the steppe in the region of middle Habur, southwest of Jebel Sinjar, a town governed directly by Mari, although the Sim'al *hana* also had to pass through here on their route toward their traditional pastures in the Habur triangle:

**Text 5.3:** [The flocks of the Yamubal] are withheld for three days and have not been given pasture. The shepherds came and said: "Of the wells (*buratum*) we ourselves control (or tenure), we can only take a third of the pasture, while the *merhum* will control two-thirds of the pasture for the [Sim'alite] *hana*." My Lord [Zimri-Lim] needs to give strict orders to Ibal-pi-El [the *merhum*]: He [the *merhum*] must send his lieutenant to make sure the sheep of Qarni-Lim [the king of the Yamutbal] can pasture and are not withheld (cf. Durand 2004, pp. 151-152; Fleming 2004, p. 78 – partly my translation from French, and my clarifications in brackets based on those by Durand – also cf. Heimpel 2003, pp. 427-428, text **27 48**).

Fleming (2004, p. 83) suggested that the Jebel Sinjar region was indeed part of the Sim'al *nighum* territory, in addition to Ida-Maraš, something that may have been the case (also cf. Heimpel 2003, pp. 30-32; Durand 2004, pp. 123, 130, 136), but it is not clear whether the Sim'alite mobile groups in text **5.3** intended to stay or were passing through. Also uncertain is whether the Yamutbal shepherds were professionals herding flocks of the king of Andarig (Qarni-Lim) or merely a mobile pastoralist group invoking their role as his subjects. However, it does show that certain situations could arise where pastures had to be shared and in those instances the *merhum* had the last word as the king's official. The fact that the Yamutbal in text **5.3** point out that they control or tenure the wells of that steppe region, east of Habur and south of Jebel Sinjar, does suggest to me that it indeed constituted part of their *nighum*. It also shows the collective aspect of the pastureland, as the Sim'alite *hana* were in the end provided with water and pasture, although it in some ways was considered a gesture of good will from the Yamutbal caretakers of the territory, a gesture that should not be abused. The *merhum's* decision of giving the lion's share to the Sim'alite *hana* may have been seen as a breach of tradition and conduct from an authority figure that was supposed to see to the welfare of the mobile populations within the sphere of the Mari kingdom, and clearly seemed unfair to the Yamutbal. The extent of his authority to include other tribes is shown by another text which states:

**Text 5.4:** (…) Previously, he [the *merhum* Bannum] lived in the steppe, and he maintained the status of the Sim'al, the Numha, and the Yamutbal (…) (Fleming 2004, p. 82).

On the other hand, the person which this text refers to, Bannum, was actually in office as *merhum* mainly during the reign of Šamši-Addu and died shortly after Zimri-Lim took the throne of Mari (Fleming 2004, p. 82). Šamši-Addu controlled or had influence over a much larger part of the Near Eastern population than his successor at Mari (cf. 3.4.2.2 vs. 3.4.2.3), and thus the Yamutbal and Numha tribes and their mobile pastoralist groups were probably situated outside the sphere of the Mari state seen in isolation at the time of Zimri-Lim and the conflict referred to in text **5.3**. However, generally conditions seem to have been peaceful (cf. text **5.5**), and we often only catch contextual glimpses when conflicts arose and the king or his officials needed to adjudicate.

**Text 5.5:** Since last year, since the Akkadians (Ešnunna?) came up to attack, the Sim'alite *hana* have been grazing their flocks in the midst of the land of the Yamutbal. No offense or breach of conduct has ever arisen (…) (Fleming 2004, p. 89).

Streck (2002, p. 166) argued that the term "since last year" fits well with a pattern where winter pasturing started around the end of November and the start of the Mesopotamian year fell around March, and thus does not actually mean that the *hana* in text **5.5** had stayed in the steppe through all four seasons. In fact, another text suggests that staying could be dangerous merely for travel, let alone herding sheep around the landscape, as:

**Text 5.6:** (…) that route [from Yamhad/Aleppo to Mari] is all desert. It is hard, not good for travel these days. These days are hard. I am afraid somebody, or else something, will suffer harm because of thirst, and afterward my lord will be angered. Who goes that route, does not go during this month. They go that route in spring or else autumn. He [Ašqudum, the traveler] must not go that route in this month. This month will be completed in 5 days. The coming month, (which is the month) of Igikur [approximately September], in 10 days or else 5, the days will cool, and the Euphrates will fill with water. (…) (Heimpel 2003, pp. 183-184, text **26 14** and note **1** – my clarifications in brackets, cf. 2.2.1 for seasonal variations).

Although this particular travelling party included ladies of the court (characterised by the writer as "delicate"), it is clear that the summer season was indeed considered a very risky part of the year for lengthy travel for all involved. Thus, I would argue that also mobile groups in general needed to keep close to secure water sources during those months. In a comparable manner to the recorded interdependent practice of stubble field grazing and manure fertilizing between pastoralists and cultivators of recent times (cf. 5.1.3.2), part of the Hammurabi code of law actually dealt specifically with this matter, stating that penalties would be imposed if this occurred without the proper agreements in place. The practice has also been argued to be the only way for EBA and MBA cultivators to get fertilisation for their fields (Luke 1965, pp. 30-31). Following the definition by Cribb (1991) above, many of these groups seem to have been proper mobile pastoralists, meaning that they included whole families moving around with their flocks, although other texts also suggest that sometimes or for some groups the wives stayed behind in the settlements or camps in the river valleys (Streck 2002, p. 168; Wossink 2009, p. 116), again very similar to certain recent practices (e.g. Barth 1956, p. 1085). Unfortunately, the texts are usually not dated according to season or month (Streck 2002, p. 158), but from the content it is possible to infer some information on the matter. For instance, one text sent from Qattunan on the middle Habur, mentions that:

**Text 5.7:** (…) The (n)th day of the month of Kiskissum (the eleventh month of the year) was in progress, and from dinnertime until the 14th day of the month of Kiskissum was in progress, rain fell continuously. For the kingdom of my lord and the *hana*, it means bounty. (…) (Heimpel 2003, p. 412; text **27 2**).

Text **5.7** thus suggests that during the month of Kiskissum (approximately January/February), the penultimate month of a Mesopotamian year, with the last month being Eburum (approximately February/March), *hana* groups were pasturing their sheep in the steppe in this region (cf. Sasson 1985, p. 442; Heimpel 2003, p. 56). Freedom of movement was of course essential to their way of life, and the tradition and practice of grazing flocks on pasture which could be located far beyond their area of summer residences – e.g. such as the Sim'al *nighum* in the Habur triangle – meant that agreements with local sedentary populations and petty kings there needed to be in place (Joannès 1996, p. 327). This is attested in several texts, e.g. as the *hana* are said to have no enemies in the Ida-Maraš after a treaty had been concluded, or that Zimri-Lim was urged to give *"presents to the fathers* [i.e. petty kings] *of Ida-Maraš"* like his predecessor had done to secure safe pasture there (Heimpel 2003, p. 31 – my clarifications in brackets). And it was not just the *nighum* itself which had to be ensured access to. Text **5.8** is oft-cited to show that the mobile pastoralist groups of various tribal affiliations had no choice but to move with their flocks, due to their subsistence practice being dependent on the arid steppe as a resource:

**Text 5.8:** My Lord knows that I govern the *hana*, and like the merchant who travels between (zones of) war and (of) peace, the *hana* travel on foot (between zones of) war and (of) peace (e.g. Fleming 2004, p. 151).

Additionally, as mentioned (cf. 5.1.3.2), the migratory cycle of mobile pastoralists could in fact be vital for the health of the herd. The Sim'al *hana* were recognised as legitimate visitors to the Habur triangle and parts of Jebel Sinjar as being subjects under the autorithy of the king of Mari (Fleming 2004, p. 151). In fact, such affiliation was a major factor for the political organisation and geopolitical structure of the Near East during the EBA and MBA (also cf. 3.4.2.3).

#### *5.2.1.3 Ancient geopolitical organisation and tribal structures*

The geopolitical power structure of the Near East in the EBA and MBA was not based on territorial states as we know from later times, because the means to militarily or structurally control vast areas really did not exist in this period. Streck (2002, p. 184) argued in fact that effective control of the steppe and mountainous regions of the Near East did not come into place until the emergence of rifle technology, although I would suggest that logistical developments doubtlessly provided e.g. the first-millennium BCE Assyrians and the Romans with certain structural and/or institutional improvements (cf. Joannès 1996, p. 326). This is one factor in Porter's (2000; 2012) *enclosed urbanism* model. The MBA Near East was divided into *matum*, a term that sometimes is translated "lands", but in fact was designating populations with political capacities, e.g. for negotiating their own peace and war. The *matum* consisted therefore of people who represented decision-making entities, although the term could also be applied on quite a complex sociopolitical structure (cf. Fleming 2004, pp. 117-130). But usually the *matum* institution was associated with polities or groups governed by proper rulers, *šarrum* (Fleming 2004, p. 105). Two other terms, *halsum* and *alum* are also important to note, with the respective meanings "district" (subsidiary areas under the king, ruled by appointed governors) and "settlement", "town", or "city", i.e. any sedentary habitation ranging from a tiny village to a royal city (Fleming 2004, pp. 105-106). Fleming (2004, p. 106) proposed that polities which are often called "archaic states" in archaeological and historical studies dealing with the EBA and MBA were not defined in terms of cities or lands as we understand it, but in terms of *matum* – the territorial population. The term could denote the realm of a king or the people subjected to his rule, but could also exist apart from kings, as a population with its own political will. Thus, the geopolitical Near East during the EBA and MBA consisted of: 1) A myriad of *alum*, integrated with each other in a complex settlement hierarchy with the large cities at the apex; 2) a number of *matum*, large and small, sometimes with a king at the apex (e.g. Mari), sometimes as a coalition of petty kings (e.g. Ida-Maraš), and sometimes as population spread across several areas, even straddling territorial heartlands, united by some form of governance (e.g. the Yaminite tribes); and 3) *halsum*, districts subordinated to the *matum* and governed from central settlements by an official. As I understand it, this is how the geopolitical structure of power operated in this period – in lieu of direct territorial control and with populations dependent on a fluid relationship to territory, a king or other powerful figure had to influence the people, or rather key actors within the many political entities, the *matum*, as well as settlements and routes of communication (cf. Fleming 2004, p. 30). The realm of e.g. Zimri-Lim of Mari was centralised and considerable (cf. **Figure 3.7**), but the territory consisted of settlement nodes and connecting routes rather than as *"blocks of two-dimensional space with strictly drawn* *borders"* (Fleming 2004, pp. 110-111). Surrounding these were vast tracts of steppe plateaus and mountain ranges where mobile groups seasonally moved around, which is again why Porter's *enclosed urbanism* is such a fitting term. These were the *hana* or *hibrum*, moving about in their *nighum* with their *nawum* (cf. **Table 5.1**), and often opposed conceptually in the ancient texts to the *sabum* (i.e. settled population) and their *alum* (e.g. Fleming 2004, pp. 51, 62-63, 97).

However, it is important to still keep in mind that as far as the textual material can be interpreted, all tribes (cf. 5.3.2) were associated with a *matum*, usually including a centre of power, and all tribes incorporated both a sedentary component living in *alum* along the river valleys and/or plains and a mobile component living seasonally as *hana* or *hibrum* on the steppe herding flocks of ovicaprines. Earlier scholars sometimes suggested that for instance the Suteans (cf. 5.3.3) were more mobile than other tribes, but it seems now more likely that their villages and fields lay further south along the Euphrates, beyond the zone of influence of the Mari state (Luke 1965, p. 123; Streck 2002, p. 170), and thus our main source of direct information on the subject. There is clear evidence for numerous sedentary villages and towns affiliated with and divided along the lines of the other main tribal groups, both along the Euphrates and Habur valleys, the northern plains, the Orontes valley, and around Jebel Sinjar (e.g. Luke 1965, pp. 157-160; Fleming 2004, pp. 95, 121-124; Durand 2004; Millet-Alba 2004 – cf. **Figure 5.12**). Many texts also allude to the structure of tribal organisation in the MBA, although there are some aspects which have not been fully unraveled yet and around which there is some debate. However, the main lines seem to be figured out, and the most important terms to note in this respect are *gayum* and *li'mum*. Once more I will mostly have to turn to Fleming (2004) and Durand (2004) for the most informed studies, giving weight to their extensive experience and knowledge within the history of research on this subject. Additionally, Streck (2002) provided quiet a concise and comparative synthesis of the MBA seen in light of modern tribally organised kinship systems, employing terms within a hypothetical and hierarchical framework from tribal confederation, down through tribes, clans, families, and households (cf. **Figure 5.7**). This framework should not be considered as strictly defined, but rather serve as a general model of the tribal organisation in function during the Near Eastern EBA and MBA, partly based on the Mari texts, partly on tribal structures in operation known from anthropological research on recent tribal structures (e.g. Barth 1961, pp. 50-54).

One scholarly disagreement surrounds whether or not the term *li'mum* corresponds more or less to "tribe", while *gayum* was the term for "clan", i.e. the former being situated higher on the hierarchical ladder and being the apex subunit within a tribal confederacy. This was the opinion of e.g. Durand (2004, p. 158), as he divided the Yamina tribal confederacy into five tribes, *li'mum*, under which he grouped clans, *gayum*, and below that, extended families or perhaps households, termed *bitum*. However, Fleming (2004, pp. 57-58) argued against such a generalised tribal framework, suggesting rather that each tribal confederacy, the main ones being the Yamina and the Sim'al, incorporated their own particular terminology designating tribal organisation. He agreed with the five *li'mum* of the Yamina, but thought that *gayum* was the first-order component the Sim'al – i.e. the difference between the terms being merely variations in expression – and advocated against translating this term as "clan" or "tribe", favouring the more neutrally sounding "division" (Fleming 2004, pp. 43, 47, 57). Such an organisational system of structural classifications is indeed also known from Barth's (1961) study of the Basseri (cf. **Figure 5.7**). According to Fleming (2004, p. 58), wide definitions were common features of Mari terminology, with many not being restricted to an exact rank within a hierarchy, but merely assumed subordination to some other unit within the structure. The contextual specifics of this topic will be treated further below, under the respective paragraphs for the Near Eastern tribal units in the MBA (cf. 5.3.2 and 5.3.3). It suffices here to mention that some debate does exist on the matter, but altogether the tribal structures of kinship are acknowledged along their general lines by a majority of the relevant scholars, and these terms were employed by these societies to identify kinship relations (Fleming 2004, p. 58).

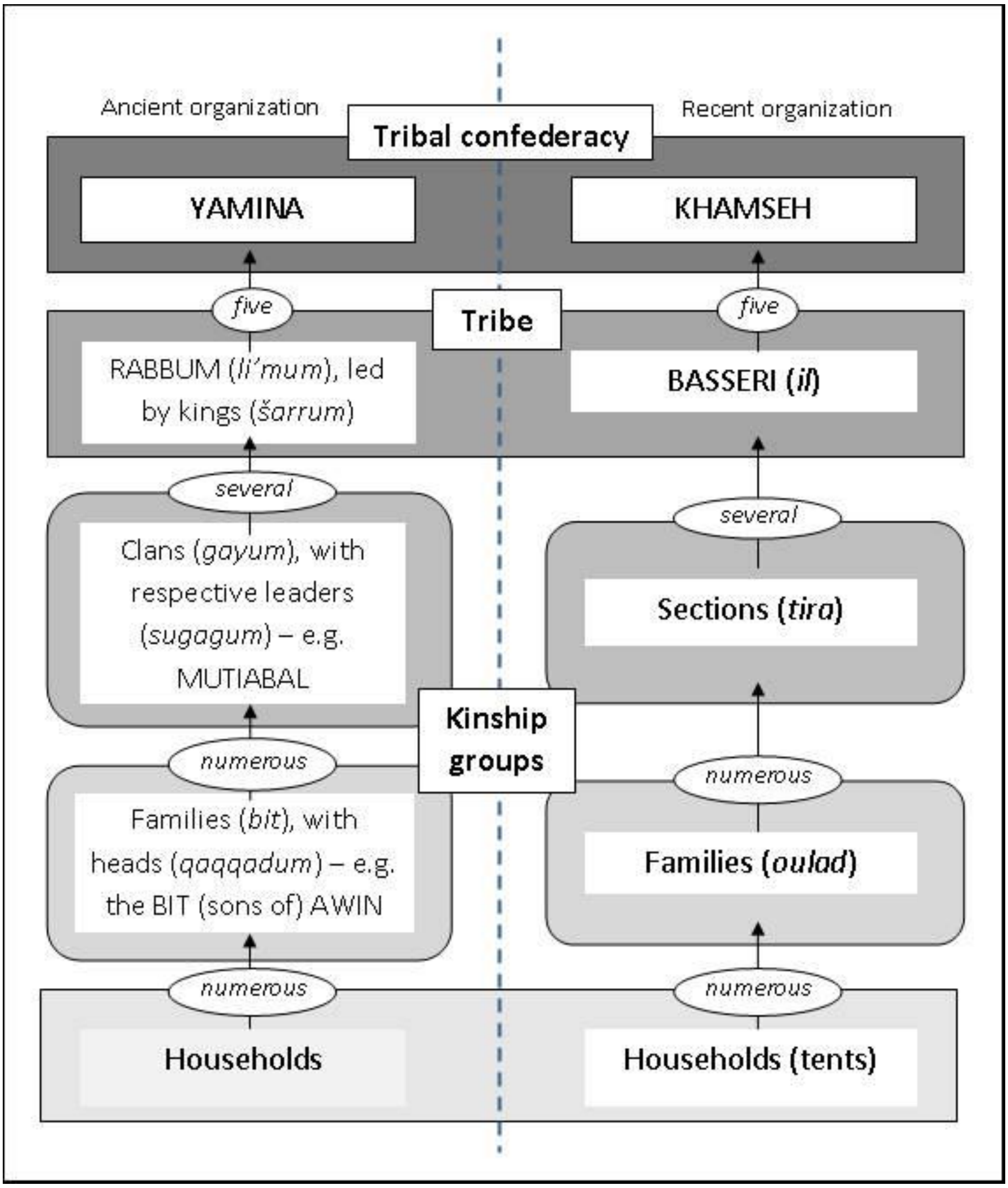



**Figure 5.7:** Model of recent and ancient organisation of Near Eastern pastoralist tribal groups, based on Streck (2002, p. 180, abb. 5) and Barth (1961, pp. 11, 22, 50-54). Although I do not necessarily advocate a direct analogy or continuous link across four millennia, the similarities are many – and at times striking.

Generally, the term *li'mum* was used to define tribal groups bound to a leading patriarch, sometimes constituting elements of a confederacy. In fact, in the LBA the term continued to be employed with the meaning "people" or "tribe" (Fleming 2004, p. 61). The leading or ruling patriarchs were as far as we can discern called kings, *šarrum*, and we know that e.g. in the case of the Yamina confederacy (cf. 5.3.2.2), each had a *matum* and a central town, constituting separate political entities (Fleming 2004, p. 93). Smaller units, such as clans, settlements, or groups of *hana* or *hibrum* were led by figures called *sugagum* (cf. **Table 5.1**), but organisationally the concept could vary in meaning. One *sugagum* could be the leader of two settlements incorporating one *gayum*, one *gayum* could have several *sugagum* to lead separate subunits within it, or there could be a one-to-one basis where a *sugagum* was identified by his associated town and/or *gayum* (Fleming 2004, pp. 44-45, 55). The important difference here seems to have been that while *li'mum* had rulers, *gayum* had figures more appropriately called leaders. Thus, when related to the difference in opinion of this latter term mentioned above, the Yamina had several rulers, one for each of the tribes making up the confederacy, while the Sim'al with their central capital at Mari were ruled by *one* king, albeit through a number of officials acting as *sugagum* or *merhum* over a number of *gayum* (cf. Fleming 2004, p. 43 – cf. 5.3.2.1). Unfortunately, the texts provide very limited information on this topic with regard to the other main tribal groups or confederacies of the MBA Near East, but it seems reasonable to assume that similar structural frameworks for tribal organisation were in play for these as well. One example highlighting both this system in practice and how *hana* property was measured in livestock is text **5.9** in which a *hana* had deserted a Sim'al contingent of troops under the ultimate rule of Zimri-Lim:

**Text 5.9:** (…) Now then, Lawasum, the Yumahammu [his *gayum*], has taken leave. His *sugagum* is Dadi-Lim, and his property consists of 200 sheep and five donkeys. My lord should confiscate this (Fleming 2004, p. 50 – my clarifications in brackets).

Another text clarifies other aspects rather fortunately, in that it shows the dualistic nature of subsistence even within an extended family, or at least at a subunit below the level of clans. It provides us with definitive evidence for that particular hierarchical position within the social and organisational structure of ancient tribes, in addition to the term for it mentioned above, *bitum*, probably translatable as "household" or "family", depending on the situation. In this text, mobile members (actually denoted as *hibrum* of the *nawum*, cf. **Table 5.1**) of the "children of Awin" are provided with an amount of agricultural land, and all participants in this legal document, both the eight receiving sons "of the steppe" and the five selling sons "dwelling at Appan" (an *alum*) are said to belong to the "house of Awin", part of the larger tribal unit of Rabbum, which is well-known as having been part of the Yamina tribal confederacy (cf. Luke 1965, pp. 67-68; Fleming 2004, pp. 31, 95-96 – cf. 5.3.2.2 and note 23). They constituted therefore a descent-based group, actually or otherwise descending from the ancestor, forefather, and/or patriarch Awin, which incorporated both steppe-based and town-based family members, although Fleming (2004, p. 95) thought the relatively large number of "sons" suggested the group represented more than a mere household (also cf. Barth 1961, p. 11). This was probably also suggested by Luke (1965, p. 68), as he believed each participant to be leaders of some stature, although whether each led his own household or perhaps extended family is uncertain. I have in **Figure 5.7** ranked this tier as families, just above household, following the suggestions of these latter scholars. Such kinship structures were in this spatial and temporal context patrilineal, a near-ubiquitous feature of Near Eastern tribal structures (Barth 1961, pp. 29-30). Tribes and clans probably segmented to numerous households or extended families seasonally as the basic unit, while when faced with questions of warfare, protection, or territorial claims, the larger units came into operation – either on the level of clan, tribe, or ultimately confederation (Luke 1965, p. 63).

#### *5.2.1.4 Non-pastoralist practices by mobile groups attested in ancient texts*

The act of raiding is extensively documented throughout the textual corpus from Mari, although in earlier studies these actions were often misunderstood as hostile conflict or acts of war, rather than acknowledging the traditional social and economic mechanism it served for mobile pastoralist groups as part of their seasonal movements, or as part of competition in tribal contexts (Luke 1965, p. 269). However, already Luke (1965, p. 267) suggested that the Akkadian term *šahatum* which denoted raid or pillage, was not considered to be part of warfare, but rather mainly represented an act of aggression with the objective to steal livestock from another tribal group to enlarge or replenish their own flocks, e.g. due to famine or other loss (Luke 1965, p. 129). Seen from the perspective of Mari, raiders seem frequently to have been of Sutean stock (cf. texts **5.10-5.12**), but such events did *not* necessarily occur annually and were clearly reciprocated by *hana* or those affected when possible (cf. 5.3.3, text **5.21**). When a Sutean group *did* raid the districts near Mari, it was reported, which is probably why we usually only hear of them in such contexts (Luke 1965, p. 130). Both Yaminite *hibrum* and Mari's own Sim'alite *hana* (e.g. Luke 1965, p. 268) were also sometimes described as raiding or preparing for raid on other groups for livestock.

**Text 5.10:** (…) Suteans made an attack in Madinatum [part of the steppe under Mari control, but outside a *halsum*]. I [Buqaqum, the *sugagum* of Sapiratum in Suhum, cf. **Figure 5.12**, no. 10] went to the rescue and brought back sheep. The son of Ahi-Ebal and the son of Sumu-Labu [presumably known Suteans] extricated themselves and got away. And I brought back two Sutean women and three donkeys. On my march, I made an incursion among Sutean sheep and kept my ears open for an opportunity to score a hit [i.e. an opportunity for a counter-raid]. (…) The Sutean Guladu fled and came to me. He is staying before me. (…) (Heimpel 2003, p. 385, text **26 483** – my clarifications in brackets).

**Text 5.11:** And at the time of the harvest, after their allies have joined with them, and when “the hand is loosened upon them” [uncertain meaning], they [the Suteans] will come down to the bank of the Euphrates, and when they have watered their flocks in the streams, they will launch a great raid (Luke 1965, p. 117 – my clarifications in brackets).

**Text 5.12:** (…) Gazizanum, Abi-sare, and Hammi-talu, the Suteans, as well as 2000 Suteans gathered to hold council. They went to raid the flocks pasturing the steppe in the land of Qatna. At the same time, another group of 60 Suteans went to raid Tadmor [Palmyra] and Našala [Qaryatein]. They returned empty-handed and the people of Tadmor have even killed one. (…) (cf. Joannès 1997, p. 408; Durand 2009, p. 507, text **745 [V 23]** – my translation from French and my clarifications in brackets).

Mobile groups thus carried out raids as part of their seasonal migration with the herds, and text **5.11** took place in early summer (at the time of harvest), a time when they probably were on their way back from their *nighum* to the safety of the Euphrates valley. In conjunction with this, Sutean *hibrum* tried to seize an opportunity to replenish losses of the season as they passed through the territory of Mari, probably against either Yaminte or Sim’alite groups in the area. However, they had to make sure that their own flocks were taken care of before launching the raid (Luke 1965, p. 117). Text **5.12**, which is an important but relatively isolated source on conditions in the Palmyrene, shows how mobile groups could raid in both large and small scale, as well as how extraordinary it was that lives were lost through the implementation of such actions. Evidently, restrictions on taking of human lives were generally upheld in regular raiding, as known also from anthropological studies (cf. 5.1.3.4). The texts also indicate the complex relationship between tribal groups. Every group raided sheep from another if the opportunity arose, but certain characters or smaller groups were seemingly considered responsible, and text **5.10** suggests that not necessarily all Suteans in general were in such cases deemed to be antagonists. Livestock also constituted spoils of actual war in a major way:

**Text 5.13:** (…) Turukkeans [people found across the Tigris, north of Lower Zab] raided the land of Ekallatum on the other side of the river and went all the way to Kurdiššatum. They took the sheep of Išme-Dagan [the ruler of Ekallatum, son of Šamši-Addu], all of them. There was nothing left for miles. They carried off the inhabitants of four of his towns [*alum*, size unknown], and beat 500 troops of his. (…) (Heimpel 2003, p. 362, text **26 425** – my clarifications in brackets).

**Text 5.14:** (…) 500 Turukkeans made a raid below Ekallatum and Aššur and reached Razama. They captured 100 persons and 50 cattle. And nobody stood up to them. (…) (Heimpel 2003, p. 362, text **26 519**).

These examples probably represented raiding associated with genuine warfare, as the Turukkeans are said to carry off inhabitants, probably for slavery, as well as large numbers of livestock, ravage the countryside, and fight large pitched battles with the troops of Ekallatum. It was an effective way of carrying out economic strikes within the context of war, such as when Hammurabi of Babylon launched raids against the sheep flocks of his enemy Elam in southwestern Iran (Luke 1965, p. 268).

Finally, I will discuss some of the evidence which suggests that mobile pastoralists practiced multifaceted resource procurement strategies also in the Bronze Age, again mainly inferred from descriptions in the Mari texts (cf. **Figure 5.8**). Liverani, in his comment to McCorriston (1997, p. 537), argued that the seasonal mobility found in the Near East was perfectly suited to the winter-cereal growing cycle, while Porter (2007, p. 98) went further and suggested that with extensification in agricultural production, cereals were sown across the pasture territory as part of the seasonal migration, providing opportunities for additional fodder on the return. Hole (2009, p. 267) argued that it was indeed likely that mobile pastoralists in the Habur triangle planted fields along the now dry streams coursing the steppe and built camps in particularly favourable drainages where water could be secured for crop and domestic use. However, there does not seem to be irrevocable evidence for such practices in the textual sources. Despite this, I also find it highly likely that an opportunistic spirit within a context of multi-resource strategy makes this logical leap quite a short one. Among many other practical uses, I suggested above (cf. 4.5.4.2) that the thousands of stone enclosures found scattered across the Palmyrene could in fact have served precisely such a purpose. Bradbury (2011, pp. 474-475) also focused on the wide array of possible strategies in her area, in addition to Negev, Hauran, and Jaulan for comparative purposes, and argued that such practice had high potential as a mechanism against stress and risk reduction faced with e.g. environmental deterioration. The Mari texts often show the horizon on which the *hana* operated, being the experts on steppe survival and a mobile lifestyle. Streck (2002, p. 173) presented two simple models which neatly illustrate the multisided aspects of mobile pastoralism, as well as how the seasonal context and schedule influence these strategies (cf. **Figure 5.6** and **Figure 5.8**).

Most of these activities are attested in the Mari archives, and many of the texts mentioning them can be found in Heimpel's (2003) English translations. Hunting on the steppe is documented by several texts, but mainly when the *hana* hunt or chase dangerous animals (cf. 2.7.6), like aurochsen, caught with pits for horns and skin (texts **26 286, 26 331**, and **27 51-52**), or lions lurking in the rural areas of Mari (text **26 106**). However, there are also attestations of *hana* carrying out onager hunts for skins and fishing certain carps or eels (text **27 51**), as well as catching two types of locusts on the steppe (*erhizzu* and *ergilatum*), specifically found in various parts of the Jezire, or collecting ostrich eggs (e.g. texts **27 9** and **FM 2 62**), which seem to have been highly prized on the royal table. In addition, roe deer, red deer, and particularly gazelles are shown to have been hunted (cf. Streck 2002, p. 172, text in **ARM 14**, **86: 9-10**; also cf. Sasson 2004, p. 207, note 76 for more on the topic of fauna and hunting), the latter probably an annual and scheduled event in the region due to their migrating nature, although probably too commonplace to merit specific mention. Incidentally, Sasson (2004, p. 207, note 76) believed that the large number of gazelles prepared (n=231) meant they probably were raised semi-domestically. However, taking into consideration the large number of kites in the Palmyrene (cf. 4.5.5.1), as well as the accounts of Musil (1928) and other early travelers (cf. 4.5.5.2), this number seems to me perfectly feasible to obtain in a relatively short time through kite-hunting of wild gazelles. Plant resources are widely attested to be gathered by *hana* on the steppe, often certain delicious truffles emerging after the winter rains, whereas other, but similar types of fungi (toadstools) were labelled inedible (texts **27 46**, **27 54**, and **FM 2 62**). Other species of vegetation mentioned to be collected in the mountain ranges of the steppe plateaus in large quantities are madder (*Rubia tinctorum*, presumably as dye for the textile industry – cf. 5.2.2.1) and terebinth nuts, which were procured by beating the tree stems with rods (texts **27 52** and **27 53**). Members of the *hana*/*hibrum* were also sought after as guides for caravans or troops traversing the arid steppe or as military contingents, and attested to have captured and sold slaves (cf. Joannès 1997, pp. 410-411; Streck 2002, p. 174), although this last practice was probably a ubiquitous one as part of Near Eastern conflict and war in the EBA-MBA (see above). However, their main occupation involved ovicaprine husbandry, shown above to be well-attested in ancient texts, but also visible in the archaeological material.

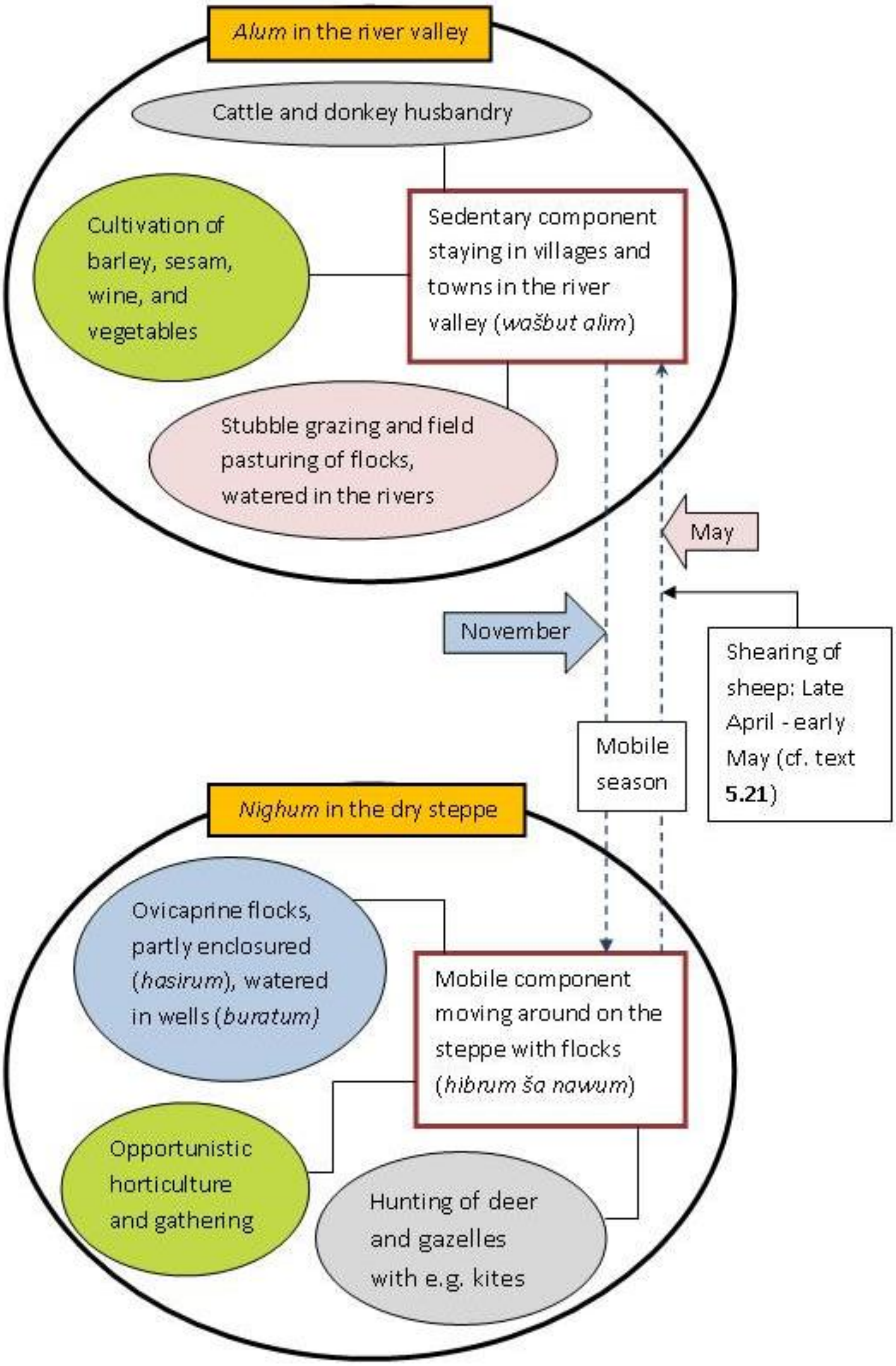



**Figure 5.8:** Seasonal cycle of mobile pastoralism in light of multi-resource strategies attested in the Mari texts. This model can be compared with **Figure 5.5** and **Figure 5.6**. Note the economic dualism of the Near Eastern tribes argued in 5.1.2.2 and 5.2.1.3, where both a sedentary and a mobile component are integral.

### 5.2.2 The pastoral economy of the EBA-MBA: The archaeological record

Clearly, sheep played the dominant part of the economy during the Near Eastern Bronze Age, which is why both private and royal flocks were so important to target in competition, conflict, or outright war between large and small actors and groups in the region (cf. 3.3 and 3.4). In fact, production based on sheep and by extension wool and textiles, was the backbone of the economy and foundation of private and public wealth in the Syro-Mesopotamian states (e.g. Fleming 2004, p. 115, with reference to Porter 2000 – cf. e.g. text **5.9**). The development of the wool industry is generally also seen in close association with the expansion of mobile pastoralism. The origin of mobile pastoralism is not an issue in this dissertation, as it is quite evident that mobile pastoralism in the Near East was well underway and economically integrated to the point of specialisation by the latter half of the 3rd millennium BCE (cf. 5.2.2.2). However, certain developments leading up to this time can be fruitful to summarise shortly here to show the basis upon which pastoralism was integrated into the economic structure of the time, as well as the context of its geopolitical and environmental conditions. Prior to the Chalcolithic period, ovicaprines were mainly exploited for meat and hides, and pastoralism as subsistence strategy on renewable products only emerged on a large scale after the secondary products revolution (cf. Sherratt 1981). Because wild sheep do not have long wool nor produce milk surplus beyond the needs of their offspring, the selection process for large-scale wool production would have taken time (Akkermans & Schwartz 2003, p. 74), notwithstanding any necessary changes and developments in the economic framework and the trade networks. This shift is generally thought to have occurred in the 4th millennium BCE, i.e. the Chalcolithic or Uruk periods of Syro-Mesopotamia (Sherratt 1981; Akkermans & Schwartz 2003, p. 206). Archaeozoological material suggests wool-bearing sheep were being exploited at this time, with a great increase in the amount of sheep and goat remains evident in the faunal material and backed up by Uruk texts, although wild resources also remained important (cf. Akkermans & Schwartz 2003, pp. 205-207; Bradbury 2011, p. 470). One major consequence of this development was that the principal material for textiles and cloth, flax (for linen), was replaced by wool, and the latter raw material could be produced *outside* the cultivated zone, thus freeing up precious agricultural land for additional food production (McCorriston 1997, pp. 517, 523). The initial Chalcolithic developments were then followed by a significant expansion of mobile pastoralism into the steppe lands during the EBA, probably as a response to economic demands (cf. Fleming 2004, p. 36).

#### *5.2.2.1 Pastoral production in Near Eastern archaeology and ancient texts*

Wossink (2009, pp. 104-111) synthesised the archaeological evidence for pastoral production in the EBA and MBA in the region, which supported the picture showing such a development. Most faunal assemblages along the Euphrates and Habur valleys contain a large predominance of ovicaprines relative to other species. Along the Turkish part of the Euphrates the percentages are 40-70 %, while in the Tishrin-Tabqa Dam area they are as high as 50-90 % of the total. In upper Habur sites, sheep and goat represent 40-80 % in each assemblage, while the middle Habur shows quite a wide range, with 30-90 % depending on the site. These portions seem to increase from north to south along the main river valleys, as well as increase from being a majority to dominate assemblages in a diachronic development from the early to the late 3rd millennium BCE (cf. Wossink 2009, p. 106, fig. 6.2), with an additional considerable increase from the late EBA and into MBA. Archaeological material from Jezire sites like Tell Chuera (cf. **Figure 5.9**) show even higher overall percentages (70-90 %), with wild species nearly absent. The northern plains on the other hand, represented by Umm el-Marra (probably ancient Tuba), have slightly lower percentages (40-60 %) of sheep and goat in the assemblages, but interestingly include a certain amount of onager and gazelle bones. In the MBA, the numbers seem to reverse at this particular site, with onager remains increasing dramatically relative to ovicaprines. Skinning in a standardised form seems to have been the main way of processing these animals. Thus, onager exploitation was probably associated with procurement of leather products as a mass-produced commodity in the MBA, but it probably also played a ritual role in concluding treaties, where the slaying of equids was an important practice (Nichols & Weber 2006, pp. 43-53). Generally, there is not much archaeological data on faunal material from the early 2nd millennium BCE, but the available evidence suggests an even heavier reliance on sheep and goats, with both a specialised mobile and a small-scale village component of pastoralism present (Wossink 2009, pp. 110, 114). For instance, late MBA remains from Tell Ashara (ancient Terqa, cf. **Figure 3.6**), firmly situated in the cultivated zone, contain 37 % sheep and 40 % goats, with only 11 % cattle and a miniscule 0.003 % portion of pig bones (Galvin 1987, p. 124; Wossink 2009, p. 110). Thus, while there are variations from site to site, the general trend through the 3rd and into the 2nd millennium BCE is clear – ovicaprines became more and more important in the Syro-Mesopotamian region indicated by pronounced increases of such animals in assemblages from this period, mainly at the expense of wild animal exploitation.

As textual sources from Near Eastern sites enter the scene, they back up this picture further. One source often mentioned is the Drehem archives (cf. **Figure 3.2**), dating to the last century of the 3rd millennium BCE (cf. 3.2.4). In one year, their scribes recorded an estimated 28,000 cattle and as much as 350,000 sheep at only one site within the Ur III state (Galvin 1987, p. 124). This was centralised control of large-scale pastoral production, where secondary products as well as the animals themselves were processed throughout the year. However, there is evidence of clear seasonal variations, with high numbers coming in during autumn and winter (175 per day), and low numbers during spring and summer (10 per day) (Wossink 2009, p. 109). This can indicate seasonal presence of herders in the region, although how it fits in with the pattern of winter/summer pasture further north is uncertain. Porter (2012, pp. 242-245) argued that the mere number of sheep mentioned in Ur III texts would necessitate grazing of flocks beyond the Ur III heartlands, potentially with a wide dispersal in a framework of mobile pastoralism ranging from upstream areas along the Tigris and Euphrates, into the Zagros mountains, down the Gulf coast, and possibly even across the Syrian dry steppe and Palmyrene to the Levant. This practice was therefore far beyond the oversight of the central administration. The Ebla texts (cf. 3.2.3) attest to widespread and large-scale pastoral production also in Syria during the EBA IV. The manufacture and distribution of thousands of various textile products is well documented, and the administration there recorded the whole process regarding its royal flocks – plucking, sorting of wool, weighing, spinning, weaving, and dyeing. In fact, the designation used in Eblaite for the buildings used to store wool also had a second meaning as “Treasury”, indicating the enormous economic importance of pastoral and textile production (Andersson et al. 2010, p. 160). Based on a single text, it has been estimated that one of the Ebla kings owned over 11,000 cattle and more than 118,000 sheep as his livestock property. He was also recorded to have given away 93,000 sheep to three of his sons, as well as 2400 cattle, which might indicate even larger numbers at his disposal. This is another example of a situation in which the royal flocks probably could not have been sustained with pasture in the vicinity of the city. Large numbers of sheep are known to have been portioned out and pastured on the steppe by village herders, and even cattle were located there. One strategy also known to have been employed to ensure access to grazing and water for such massive herds outside the direct domain of Ebla was pasture treaties with other polities (Porter 2012, pp. 247-248). This is very similar to the practices between rulers or states described in the Mari archives to ensure peace and pasture for the *hana* during the MBA (cf. 5.2.1.2). Texts from Tell Beydar (cf.

3.2.4) show that the central institution there seems to have administered c. 7400 ovicaprines, divided into 30 flocks, which were bred for wool production ("for plucking"). This would amount to an average of 210 animals per sheep herd, and 300 animals for goat herds (Wossink 2009, p. 107), not too dissimilar to the findings of Barth (1961, p. 22), where a flock of c. 400 animals per shepherd could handily be taken care of among the Basseri. However, both public and private herds were present there, some which were grain-fed and others that were sent out to graze beyond the vicinity of the city (Porter 2012, p. 247; Wossink 2009, p. 107). It is certainly possible – and I would say probable – that flocks in private hands were ubiquitous across the region, although we mostly hear of the royal flocks in texts from the palace archives for administrative reasons (cf. Porter 2007, p. 105). Near Eastern texts also show the existence of a number of sheep and goat variants, with at least three types known from EBA iconography. Of these, two are known to be wool-bearing sheep, but the fat-tailed type of these two are known to specifically have been bred for wool, and it appears quite late in mid-3rd millennium BCE (McCorriston 1997, p. 521; Wossink 2009, p. 104, note 73). From EBA IV texts in which Amorrite groups occur (cf. 3.3.3), we see that these were particularly associated with fat-tailed sheep, the latter being objects of gift-giving, plunder, or taxation, although cattle and donkeys are also infrequently occurring in such contexts. Their hardiness was a characteristic feature of these sheep, with the fat tail providing insurance in times of drought and food shortages and therefore well adapted to a mobile practice of grazing in the steppe (Sallaberger 2007, p. 448).

#### *5.2.2.2 EBA-MBA developments within Near Eastern pastoralism*

Wool and textiles were evidently the main ingredients of the EBA and MBA Near Eastern economic structure, and seem to have constituted the bulk of both luxury and everyday items within an exchange system of gift-giving and commoditisation institutionalised on several levels (cf. McCorriston 1997, pp. 518-520). This is probably also why the expansion in pastoral practices seems to have been so significant. Texts recording textiles as gifts or payment for deeds are numerous in the Mari archives, as for instance in this text showing Hammurabi of Babylon paying troops in cloth:

**Text 5.15:** (…) The day I sent this tablet of mine to my Lord, 1 thousand Mutiabalean [probably a Rabbum clan, cf. Durand 2004, p. 158 – cf. 5.3.2.2] troops arrived in Babylon from the land of Kasalluk and pitched camp at the Tilmunpalm orchard. Hammurabi came out to them and made them happy with words. (…) Their generals received a grand gift; their staff commanders received ewe-wool shirts, [the troops?] that were not clothed in a garment, were indeed clothed. (…) (Heimpel 2003, p. 321, text **26 366** – my clarifications in brackets).

Thus, wool – mainly as textiles, but not always – formed an essential part of the economy, which also included a wide array of ritual performances of sacred and secular nature across the Near East, e.g. in commemorative mortuary practices (Porter 2012, p. 247). The importance of textiles in the Anatolian trade based in Aššur in the early MBA is well-known from the Kaneš archives (cf. 3.2.4), but as more artefacts from Syria and Mesopotamia is actually found in Anatolian 3rd millennium BCE contexts than those dating to the early 2nd millennium, Lassen (2010, p. 166) suggested that the trade was probably just as extensive in the EBA. Porter (2007, p. 98) argued that pastoralism replaced intensified agriculture in the late 3rd millennium BCE as a method of providing surplus, with cultivation returning to a subsistence role in the economy as it was no longer necessary for surplus production. Wossink (2009, p. 112) suggested in fact that the correlation between urbanism and emergence of specialised pastoralism could indicate a causal mechanism between these aspects, reflecting a monetisation and professionalisation of parts of the pastoral and agricultural economies. The *kranzhügel* phenomenon of the mid-EBA (**Figure 5.9**) is usually seen in this context (e.g. Lyonnet 1998; 2001; 2004; 2009; Akkermans & Schwartz 2003, pp. 256-259; Hole 2009, pp. 266-267; Wossink 2009, p. 108). These settlements were found mainly in the western Jezire, particularly around Jebel Abd el-Aziz, with some possible examples found outside this region – i.e. they are located in marginal areas for regular cultivation. Although few of them have been excavated extensively, mainly Tell Beydar and Tell Chuera (cf. Wossink 2009, p. 108), the agricultural potential in their environs suggests that their estimated quite significant populations would have had to rely heavily on pastoral production to be sustainable (Kouchoukos 1998, pp. 391-393). The initial establishment of *kranzhügeln* seems to have occurred in the early part of the EBA (c. 2900 BCE) in northern Jezire, with large-scale activity generally dating to the mid-3rd millennium BCE, while a latter phase of new establishments (e.g. Rawda and Umm el-Marra) arose in central Syria in the early EBA IV (c. 2400 BCE), and lasted until the end of the millennium (Akkermans & Schwartz 2003, p. 256; Lyonnet 2009, p. 181, and note 5). This second phenomenon (particularly Rawda) is not considered to be proper *kranzhügeln*, but share certain similarities, being circular settlements in arid regions and probably associated with semi-mobile populations largely practicing pastoralism, but within a context of landscape management enabling some degree of cultivation in *faydas* and other topographically advantageous features (also cf. 4.5.4.2 and

**Figure 4.36**), as well as hunting and plant harvesting providing wild resources from the steppe (cf. Lyonnet 2009, pp. 188-191). Of course, also the true *kranzhügeln* may have taken advantage of such strategies locally. The latter phenomena coincided with a general expansion into arid regions associated with intensification and integration of a fully specialised pastoral economy producing wool for the textile industry, which through the rural-urban exchange networks had its main consumption outlets among the large urban core areas of the river valleys and the Syrian plains, e.g. Mari and Ebla (McCorriston 1997, p. 534; Wossink 2009, p. 114; Bradbury 2011, p. 479), but perhaps also constituting part of further-reaching networks, e.g. toward Anatolia. Hole (2009, pp. 266-267) argued that they were indeed designed and built for large-scale steppe exploitation in connection with the commodification and institutionalisation of the textile trade. They have often been characterised as ritual centres, rallying points, and strongholds for mobile populations during the EBA. Both starting points of these steppe establishments (c. 2900 BCE and c. 2400 BCE) took place in periods of climatically favourable conditions, although the climate varied during their time as well, with particularly the late 3rd millennium BCE arid spike (cf. 2.5) being of relevance. This particular climatic event could even have been one of the causes ending the phenomenon of large-scale steppe settlements, resulting in seasonal mobility on a higher degree as described above in the late EBA IV and the MBA. Bradbury (2011, p. 479) suggested in fact that sites in her study area, the Homs NSA (cf. **Figure 4.55**, areas A and B), were abandoned in the later part of the 3rd millennium BCE, perhaps by populations pursuing opportunities further east.

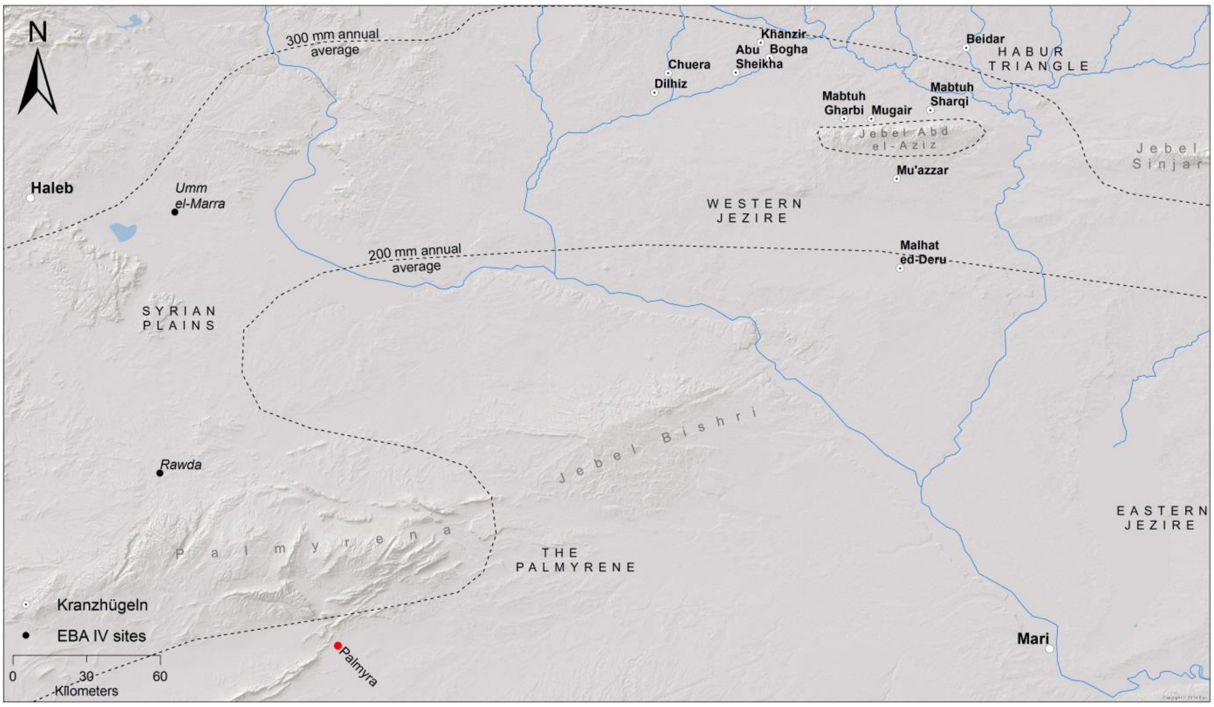



**Figure 5.9:** Map of *kranzhügel* sites found in the western Jezire, particularly around Jebel Abd el-Aziz and its run-off area, as well as later sites of similar character also found in arid parts of Syria. The former were seemingly established in the early 3rd millennium BCE, while the latter were part of a second phase of arid region establishments in EBA IV (c. 2400 BCE). These settlements were probably inhabited by both pastoralists and cultivators, taking advantage of local potential for water management for agriculture. Additionally, climatic conditions may have been more favourable for parts or most of their existence, at least with regard to the former *kranzhügel* phenomenon (cf. 2.4 and 2.5).

The transition to the MBA is as mentioned above less certain from an archaeological standpoint, but the disparity of evidence does not necessarily mean that a shift in organisation did occur (Wossink 2009, p. 111). While faunal material is the dominant piece of evidence from EBA sites, textual sources are far more abundant from the MBA period, mainly due to the Mari archives, and thus the perceived difference may be a mere result of the nature of available evidence. Although the composition of faunal remains at sites seems to have been fairly similar, Wossink (2009, pp. 114-117) argued that there was a shift in settlement patterns with abandonment of sites in several arid upland zones from the EBA to the MBA. He maintained that a dual pastoral economy of a highly specialised component geared for exchange and a village-based component practicing subsidiary pastoralism existed side by side from the mid-3rd millennium BCE and into the MBA, but suggested that pastoralism in the latter period was characterised by higher mobility than before and an even larger degree of specialisation (Wossink 2009, pp. 117-118). Whether or not this means that the practiced pastoralism itself was significantly different is not certain. Porter (2012, pp. 238-241) argued that the view of EBA pastoralism as mainly state-controlled, without room for mobile tribes existing alongside with royal flocks, and thus inherently different from the later picture of the Mari archives, was a misreading of the textual evidence. She backed this up with tablets from Ebla suggesting the existence of *kammu* in and around this polity (cf. 5.2.1.1 and 5.3.1.1). I tend to agree with the view presented by both of these scholars. During the period from EBA IV to MBA, the Near East and particularly Syro-Mesopotamia included specialised pastoralists practicing a mobile lifestyle along similar lines as more recent forms of ovicaprine pastoralism, with seasonal grazing in traditional territories, at least as the climate deteriorated around the 4.2 ka BP arid spike and onward. From then on, pastoralist populations of the region responded by increasing mobility as a risk-management strategy, while the mainly cultivating component of the tribes relocated to more secure conditions of the river valleys and northern plains of the region in a process of settlement nucleation (cf. Wossink 2010).

Conclusively, there seems to be quite good correlation between the lifestyle documented among recent or modern mobile pastoralist populations in the Near East (e.g. Barth 1961; Wirth 1971; Streck 2002) – and partly the Middle East (Barth 1956) – practicing sheep and/or goat herding, and the trends suggested by archaeological and textual material on this topic from the EBA IV (particularly the later part) and the MBA. However, like many before me, I will caution against attempts at direct comparison through analogies, and suggest that each aspect should be studied comparatively in a non-presumptuous manner. I would argue that this has been carried out in a satisfactorily manner here, with many of the facets described under the general outline of mobility, pastoralism, and tribes (cf. 5.1.2 and 5.1.3) arguably seeming to have been in place among the *amurru*, *hibrum* or *hana* during the Bronze Age (cf. 5.2.1 and 5.2.2). I will now turn to the tribal groups known to have operated in the late EBA and MBA and specific aspects of their temporal and spatial contexts, seen in light of the discussion above.

## 5.3 Near Eastern tribal identities during the EBA and MBA

### 5.3.1 The Amorrite conundrum

Studies of EBA and MBA mobile pastoralism including textual sources will usually have to consider the Amorrites, who they were, and their impact on Near Eastern societies in these periods. They have long been shrouded in uncertainty, at times bordering on scholarly myth, not least assisted by an apparent mention in the Hebrew Bible (as "Amorites", cf. Whiting 1995, p. 1231; Fleming 2004, p. 14)[24]. However, it is important to disassociate the Amorrites from that particular tale and investigate their role in the Near Eastern Bronze Age in a more rational manner by looking at how they influenced the narrative written by the EBA scribes of southern Mesopotamia and how their identity spread across the region to become near-ubiquitous in the Syro-Mesopotamian heartland. The Amorrites are often viewed as the "archetypal nomads" and "paradigmatic outsiders" to the southern Mesopotamian world, but not much is certain of how their diffusion came about and from whence it may have started (Porter 2012, p. 251). Early research (cf. 5.1.1.1) focused on invading mobile groups coming from the Syrian dry steppe and settling in the river valleys (e.g. Kupper 1957; cf. Zarins 1990), either in waves or as a continuous pressure, subsequently adjusted to infiltrating pastoralists migrating into the cultivated zone in smaller numbers and in time being employed as mercenaries or officials (Whiting 1995, p. 1234). In any case, by the 19th century BCE dynasties of actual or adopted Amorrite origin and identity were established in most major cities and states across the Near East (Porter 2012, p. 251; Wossink 2009, p. 125), with the question of how it came about still not being satisfactorily answered. However, intriguing new perspectives have been put forward recently (Wossink 2009; Porter 2012) which may go some way of explaining the apparent developments across the EBA-MBA transition.

#### *5.3.1.1 The Amorrites - ancient perceptions and recent theories*

One reason why the history of the Amorrites still is in the murky depths of uncertainty is the relative sparseness of texts from the 3rd millennium BCE (Streck 2002, p. 191), and the fact that it is rather difficult to disentangle all the evidence. Another problem is that those texts we know of vary quite a lot in their descriptions of and attitudes toward these people. Generally, while the nature of the earliest attestations – i.e. mainly scattered mid- to late 3rd millennium BCE texts consisting of personal names and toponyms (cf. Wossink 2009, p. 120, table 7.1) – are difficult to assess, there is a clear discrepancy between literary sources and administrative documents, at least in the Ur III texts (Wossink 2009, p. 137). Examples of the former type usually portray them as antagonists and enemies, toward which the Ur III state must stay

[24] Their biblical attestation probably relates to people associated with the collapse of the LBA state Amurru, which was situated on the Levantine coast of Syria and thus much closer in time and space to events in the Palestine and the Israelite kingdoms (cf. Whiting 1995, pp. 1237-38).

vigilant, and have been conflated with literary compositions, mainly due to connotations found in *The Marriage of Mardu* (cf. Porter 2012, p. 293). This story is in fact about the god Mardu (Sumerian – parallel to Amurru in the Akkadian pantheon), but has in epigraphical research often been invoked as the stereotypical Mesopotamian image of the Amorrites and usually not taking its original context into account (Wossink 2009, pp. 122, 124). The rather derogatory words about Mardu in this text have been explained as partly a parable to advise against marrying outside the group[25], albeit in the story the effort was unsuccessful – and this should be seen as its main purpose, with the representation of Mardu itself being neither hostile nor negative (Porter 2012, pp. 293-294). However, it is understandable to see how this link emerged, with the name of the deity and the people being essentially the same. On the other hand, *mardu* or *amurru* – essentially synonyms – is quite a layered term, which could designate a deity, a people or ethnic group, a language or dialect, an area mentioned in the Ebla archives, and/or west as a compass direction, leading *mardu* to possibly denote merely "certain individuals or people of western origin", i.e. probably from Syria – all depending on the spatiotemporal context (Whiting 1995, pp. 1231-1232; Fleming 2004, p. 39; Wossink 2009, p. 119; Porter 2012, pp. 305, 310). Finally, it is important to keep in mind that ancient scribes were not ethnographers, and as the term "Amorrite" was not a self-given one, it is likely to be biased when coming from urban Mesopotamian observers and probably rather inaccurate compared to Amorrites' own identities (Whiting 1995, p. 1232; Fleming 2004, p. 39), probably conflating a number of separate, possibly mobile, tribal groups into one large "western" population. The amount of texts from the 3rd millennium BCE, while relatively few compared to the Mari period, are still too many for the present study to fruitfully evaluate individually, and I will therefore lean on the syntheses recently put forward by e.g. Wossink (2009) and Porter (2012), which provide general diachronic perspectives on these texts as a group and the implications of their content in context. However, I will also be including other scholars' recent research for extended or alternative views in certain instances.

[25] This practice against marrying outside the tribal group was also observed among the Basseri by Barth (1961, p. 35), while an attestation in ancient times is provided by **ARM 28**, **text 36**, in which a marriage between a Yamutbalean and a Sim'alite is characterized as being according to tribal tradition and decency: "The Sim'alite hana and the Yamutbal are common blood. One can contract a relationship by marriage with the other".

| Time (BCE) | Content | Place |
|---|---|---|
| c. 2800 | "Chief" or "overseer" of the Tidnum | Ur |
| c. 2600-2500 | Deliveries of grain and bread to individuals attested as *mardu* | Šuruppak |
| | Amorrite personal names | Šuruppak |
| | Attestations of **kur** *mardu* | Šuruppak |
| | Toponyms including *mardu* (canal, bridge) | Lagaš |
| mid-3rd mill. | Mention of a *mardu* shepherd | Mari (deriving from Lagaš?) |
| c. 2350 | Thirty references to *mardu*, including: | Ebla |
| | *Mardu* and Ditanu (=Tidnum) as polities with rulers (**en**) and officials | Ebla |
| | Association with Ibal of the steppe | Ebla |
| | Victories over *mardu* | Ebla |
| | Inhabitant of *mardu* | Ebla |
| | *Mardu* as receivers of cloth as gifts | Ebla |
| c. 2250 | Naram-Sin's victory over enemy coalition including *mardu* | Agade/Jebel Bishri |
| c. 2200 | Šar-kali-šarri defeats *mardu* at Bašar | Agade/Jebel Bishri |
| c. 2100-2000 | Gudea acquires resources from the mountains of the *mardu* | Lagaš |
| | Amorrite personal names in administrative records | Ur |
| | Toponym including Tidnum (wall) | Ur |
| | Fat-tailed sheep particularly associated with Amorrites | Ur |
| | Battle against hostile *mardu*: Tidnum and Yamadium | Ur |
| 1941-1933 | Zabaia, ruler of Larsa, claims Amorrite affiliation | Larsa |
| c. 1850 | Yarim-Lim, chief of the Amorrites | Tell Haddad |
| | Itur-šarrum, chief of the Amorrites | Dinkatum |
| | Kudur-mabuk, father of Warad-Sin, called "father of the Amorrite land" | Larsa |
| | *Shakkanaku* with Amorrite names | Mari |
| 1833-1776 | Amorrite genealogy of Šamši-Addu | Šubat-Enlil/Aššur |
| 1792-1750 | Amorrite genealogy and affiliation of Hammurabi | Babylon |

**Table 5.2:** Selected attestations of Amorrites or *mardu* found outside literary sources from the 3rd and early 2nd millennium BCE and their approximate dates (after Charpin 2004, pp. 96-97; Wossink 2009, p. 120, table 7.1; Porter 2012, p. 314, table 5).

EBA attestations of the Amorrites (**Table 5.2**) are usually thought to also include texts where a group called Tidnum occurs, as this term seems to have been used interchangeably with designations of the Amorrites during the Ur III period. If such an association is correct, the earliest mention of such a group could possibly stretch back to the early 3rd millennium Ur (Wossink 2009, p. 120). However, prior to the last century of that millennium attestations of Amorrites (or alternatively Tidnum) are few and far between. In the Mesopotamian ones dating to the mid-millennium, individuals are identified by their linguistically Amorrite names or as people designated to be *mardu*, and they occur mainly as recipients of barley or grain products, or sometimes as shepherds, while Amorrites as a group are found as parts of toponyms, such as “the bridge of the *mardu*” and “the canal of the *mardu*” (Wossink 2009, pp. 120-121; also cf. Porter 2012, p. 314, table 5). However, what these latter examples signify is uncertain. The possibility of certain names from Tell Beydar texts (c. 2350 BCE – cf. 3.2.4) being Amorrite has also been put forward (Streck 2002, pp. 190-191). Among the most interesting attestations are those from the Ebla archives (c. 2350 BCE – cf. 3.2.3), firstly because they firmly originate in Syria proper and not Mesopotamia, and secondly – in the context of this dissertation – due to their relative proximity to the Palmyrene. References to Amorrites – written as *mardu* – in these texts amount to over thirty, which is a relatively high number compared to Akkadian or Ur III administrative sources (cf. 3.3.2 and 3.3.3), but a notable aspect here is the use of the determinative $^{\mathbf{ki}}$, a signifier comparable to the MBA use of *matum* known from Mari (cf. 5.2.1.3). Thus, the term *mardu*$^{\mathbf{ki}}$ at Ebla indicates that it was a geographical area or polity, although not necessarily one spatially fixed (Porter 2012, pp. 309-310). Some scholars have argued that contextually it must have referred to a fixed place or region, with suggestions anywhere from the Mediterranean to Jebel Bishri (cf. Porter 2012, p. 310), but Porter thought the circumstances may have been otherwise. *Mardu*$^{\mathbf{ki}}$ are in Ebla texts found listed together with Ditanu and Ibal “of the steppe”, and these polities or groups are clearly shown to have leaders or kings (**en**) and elders. The former of these two is thought to be equivalent to the abovementioned Tidnum, well-known from Ur III texts, while the qualifier associated with Ibal suggests a link with pastoralism and mobility. The *mardu*, Ibal, and Ditanu seem to have been independent of the Ebla polity, but their geographical focus is uncertain. It is tempting to associate them with the Palmyrene or Jebel Bishri, based on later information regarding the Amorrites (although see below and **Figure 5.10**), but Ebla has been shown to have nursed a far-reaching contact network, suggesting that a cautious approach to this question should be upheld (also cf. Porter 2012, p. 311, note 90). Their probable association with a mobile lifestyle contributes further to such a perspective. In fact, Porter argued that the *mardu*, Ibal, and Ditanu found in the Ebla texts could be a window on EBA social structures parallel to the tribal organisation evident in the Mari archive of the MBA (cf. 5.3.2), with a mobile and a sedentary component associated with each – suggested by their leaders/kings and elders – as well as Ebla itself incorporating a mobile pastoralist component of its own, the *kammu* (Porter 2012, pp. 310-311 – cf. 5.2.1.1). She likened such EBA terms to the *hana*, Numha, and Yamina of the MBA, and suggested that attestations of two Ibals *"'of the steppe' and that 'of the canal' may well parallel the bifurcated geography typical of mobile pastoralists in the second millennium"* (Porter 2012, p. 312).

It is not fully clear at this point whether this statement should be explicitly understood that she meant the *mardu* of Ebla should be seen as an equivalent to *hana* found in the Mari archive, i.e. "our" (Eblaite) mobile pastoralists, of which otherwise seemingly the term *kammu* was used, or perhaps as *hibrum* – general mobile group (cf. 5.2.1.1). However, later Porter (2012, pp. 319-320) distinctly argued this point by suggesting how *mardu* when found in that specific context, did not signify ethnicity, occupation, or political affiliation, but in fact carried the same meaning as *hana* in 2nd millennium BCE Mari. The fact that it occurs in conjunction with Ibal and Ditanu in the Ebla texts indicates that a conceptual association existed between them, which she believed to be their association with mobile pastoralism. Hence, just like administrative texts from Mari can put *hana* as well as individuals from the tribes Numha and Yamina together in one context, similar lists from Ebla could mention *mardu*, Ditanu, and Ibal "of the steppe", the latter of which is separated from another part of this tribal group, the Ibal "of the canal". Porter's exact difference between the use of *kammu* and *mardu* at Ebla is still somewhat unclear to me, but one point seems to be that only *mardu* (and therefore also *amurru*) should be seen as applicable across the region – Emar, Tuttul, or Lagash – with the meaning "our mobile component". This is a very intriguing thought, and could, like the revelation regarding *hana* a decade ago, transform our understanding of the EBA Near East, but also parts of the MBA.

References to Amorrites in texts supposedly associated with the Akkadian dynasty and the Ur III period are seemingly fraught with attestations of their troublesome and menacing behaviour. The late 23rd century BCE Akkadian rulers Naram-Sin and his successor, Šar-kali-šarri, both mentioned victories over the *mardu* at Bašar (cf. 3.3.2), an archaic version of the name Jebel Bishri (cf. **Figure 3.1**), and in many sources termed **kur** *mardu* – the mountain or realm of the Amorrites (cf. Wossink 2009, p. 121; Porter 2012, pp. 320-321). However, the first of these rulers actually fought against a rebellious coalition of southern kings from Ur, Uruk, Umma, and Lagash, and not against Amorrites, which are mentioned merely through two minor captains captured after the fray. The boast by Šar-kali-šarri is according to Porter (2012, p. 321) simply a claim of Naram-Sin's achievements, although other scholars have taken it at face value, i.e. a victory for the Akkadian king over a group of Amorrites (e.g. Sallaberger 2007, p. 445; Wossink 2009, p. 121). In the Royal Correspondence of Ur, which are letters between kings and officials, *mardu* and particularly Tidnum are occasionally found as antagonists. They were mentioned in connection with a "wall facing the highlands" and "wall of the land" (see below), and in one text, the suggestion of *mardu* as a generic term may seem to be implicitly supported:

**Text 5.16:** Hostile Amorrites – Tidnum and Yamadium – came forth (to do battle): their kings confronted him [the Ur III king Šu-Sin, cf. 3.3.3] in battle, (but) by the strength of Enlil and Ninlil he was victorious in battle (cf. Wossink 2009, p. 123).

Taking text **5.16** as it stands, it suggests that:

- Tidnum and Yamadium were considered two variants of Amorrites, like e.g. the Numha and Yamina in Mari times, and thus probably represented tribes or tribal confederacies during the EBA. They had leaders, such as attested for MBA tribal groups, and carried out independent actions within the political sphere. This coincides well with the previously mentioned evidence inferred from the Ebla material.
- The qualifier "hostile" means that other, more peaceful groups of Amorrites also existed in the Ur III world, or even that the hostility of these two groups was situational and possibly temporal.

Both of these points fit well with Porter's suggestion that *mardu* carried the meaning "mobile pastoralists" or "our mobile pastoralists" depending on the context. It must be pointed out that the historicity of the Ur III literary sources has been questioned. They are only known from MBA tablets, thus several centuries later than the events described within, and any secondary or invented additions are difficult to distinguish from the more accurate details, although some personal names seem to have been genuine (Wossink 2009, pp. 122-123). It is in such literary sources that the portrayal of the Amorrites as enemies is most pronounced, so their actual behaviour, the actual events, and the actual perception of them during this time may have been a different one. Porter (2012, pp. 278-279) has pointed out that these texts sometimes include a number of anachronisms, and that the lack of pattern within them suggests the references do not reflect the historical reality and that their historical value is minimal (also cf. Porter 2012, p. 288 on the nature of these letters). However, this does not necessarily mean that the sociopolitical organisation of the EBA Near East into tribal groups, such as the one we see during the MBA, is inaccurate. The underlying organisational structure discerned from these texts may therefore still be of analytical value. Incidentally, following the tentative conclusion that the Tidnum in fact represented a specific tribe or tribal confederation – or in the words of Porter (2012, p. 322) "ancestral group" – operating in Syria and Mesopotamia during the EBA, references to the fortification line *Muriq-Tidnim* (also known as "wall which repels the Tidnum"), which at least partly seems to have been associated with the Diyala region and Jebel Hamrin in Iraq (cf. Wossink 2009, pp. 123-124; Porter 2012, p. 322), should not be viewed as a defence against hostile mobile pastoralists (or "nomads", if you will) in general, but rather as a measure directed against a specific tribe. Porter (2012, p. 324) suggested that their apparent animosity toward the Ur III state may in fact have been linked to this polity's rigid control, bureaucratisation, and reorganisation of animal production, which of course mobile pastoralists very much depend on. The "wall" itself could have been an attempt to control their access to ancestral grazing territories or their movements in general. This seems to me to provide a good explanation, as later Ur III texts mention merely hostile *mardu*, and although some of these texts are thought to be of literary character as well as of a significantly later date, Porter (cf. 2012, p. 314, table 5) herself defined e.g. year names and text **5.16** as being "outside literary sources", thus possibly incorporating certain historical accuracies. A number of texts from the meticulous administrative record of the Ur III state are also known, as well as some from the following Isin-Larsa period, i.e. the first century of the 2$^{nd}$ millennium BCE (cf. 3.4.1). These were studied with a focus on Amorrites by Buccellati (1966), identified either by the qualifier *mardu* or the occurrence of presumed Amorrite names, and his results were summarised by Wossink (2009, p. 122). As mentioned (cf. 5.2.2.1), Amorrite groups were during the Ur III period associated with pastoralism and particularly their fat-tailed sheep. One realisation from his analysis was that Amorrites clearly partook peacefully in these societies, delivering and receiving products, carrying out diverse functions, and occupying various positions in e.g. the Ur III state, Eshnunna, and Lagash – not an unexpected picture, if the late EBA references to Amorrites as *mardu*, merely designated people associated with mobile pastoralism, in a present or recent context. In a fashion parallel to the MBA, groups or individuals which were not possible to identify by referring to their home city, were therefore rather designated by their provenance – *mardu* (cf. also Sallaberger 2007, p. 445). However, this does not necessarily rule out that the term also was used to denote "westerners" in Mesopotamia, i.e. people from Syria, depending on the context, just as Hana may have referred to a particular tribal group in the Habur triangle centered on Šehna/Šubat-Enlil (Fleming 2004, pp. 89-91 – cf. **Figure 3.7**) and the name of an eponymous ancestor or tribe (see below), although the term was mostly used with reference to mobile pastoralist groups (cf. 5.2.1.1). Evidently, terms incorporated a number of layers in the ancient Near East, probably obvious to the speaker and listener, but very difficult for modern scholars to interpret.

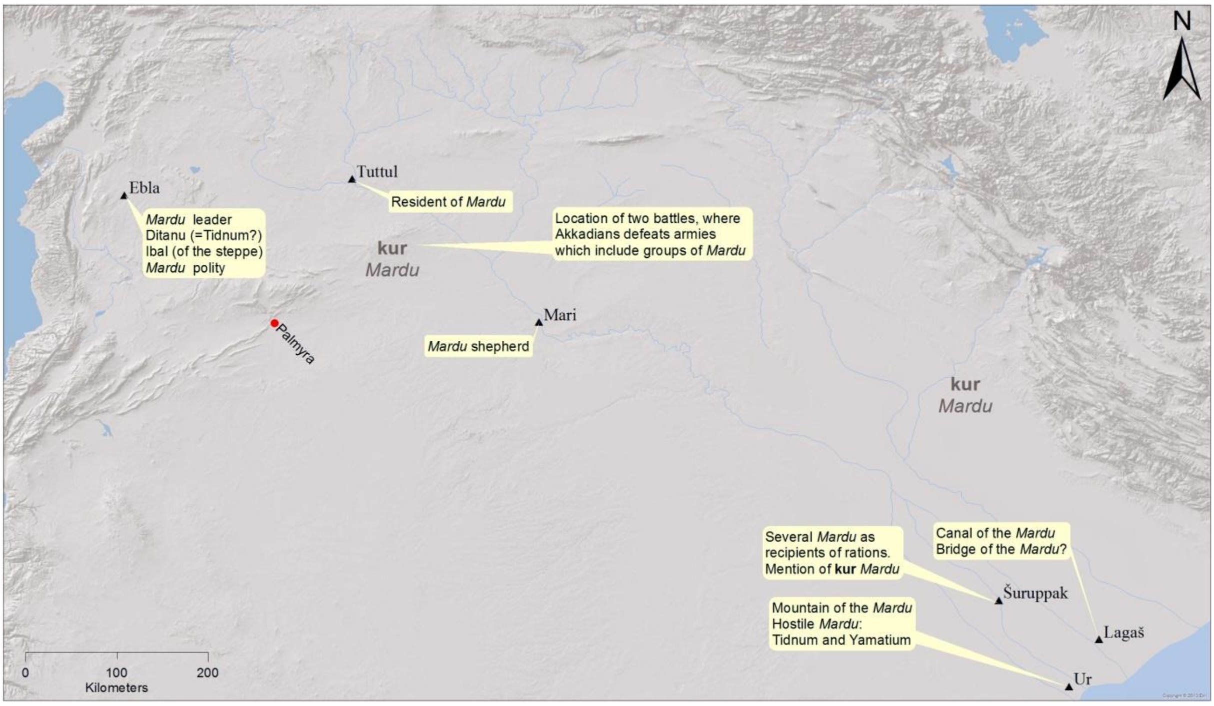



**Figure 5.10:** Attestations of *mardu* in EBA sources across the Near East and approximate locations of areas called **kur** *mardu* (mountain of the Amorrites). Evidently groups or individuals designated as *mardu* were found and recognised both on the Syrian plains, along the Euphrates valley, and on the Alluvium.

Arguments presented by Porter (2012) and hinted to by Sallaberger (2007) also provide another meaning to the term **kur** *mardu* (**Figure 5.10**). While both the attestations of Naram-Sin and Šar-kali-šarri locate events specifically in Jebel Bishri, the meaning of **kur** *mardu* may have been a different one to what scholars have perceived until recently. Rather than distinctly placing the so-called "Amorrite homeland" in this specific area, the term could merely suggest that the region was traditional grazing lands for mobile pastoralists, and not belonging to a particular entity called "the Amorrites" (cf. Porter 2012, p. 321). Likewise, the same usage has been registered in regions seemingly relatively far from Jebel Bishri, a practice which in previous research presented quite a conundrum. How could **kur** *mardu* be located in Jebel Hamrin, east of the Tigris, in the Ur III texts when the "homeland of the Amorrites" so clearly was associated with Jebel Bishri in others? The solution – and like the *hana* conclusion of research into the MBA, quite an elegant one – may be that it in fact represented a generalised term for pastoral territories, located in various parts of the Near

East, depending on the context and perspective of the writer and the mobile group it referred to. Thus, as the Gudea statue B is translated:

**Text 5.17:** From Umanum, in the mountain range of Menu'a, and from Pusala, in the mountain range of the Amorrites [**kur** *mardu*], he [Gudea] brought down big stone slabs. (…) From Tidanum, in the mountain range of the Amorrites [**kur** *mardu*], he brought alabaster blocks (cf. Wossink 2009, p. 121; also cf. Sallaberger 2007, p. 431).

The Lagaš king Gudea (cf. 3.3.2) probably conveyed in text **5.17** that he imported building materials for his projects from several areas of the Near East, two of which were located in the highlands of the steppe (cf. **Figure 5.10**) and associated with various tribal territories of mobile pastoralist groups. The Pusala and Tidnum attestations may have been geographical toponyms, but may possibly also have designated the *nighum* of these groups, although this specific term is only known from the MBA. While some scholars have been tempted to link the name Pusala with Bašar, Sallaberger (2007, p. 431, note 79) found this connection unlikely, as Jebel Bishri lies much further away from Lagaš than would be necessary for acquiring such materials. However, if **kur** *mardu* actually did function as a generic term for steppe areas or highlands, there is no need in our studies to position the names Tidnum, Pusala, and Bašar in spatial proximity to each other. It could rather refer to the winter grazing zones associated with mobile pastoralists across the Near East, although Bašar itself did quite clearly specifically refer to Jebel Bishri (cf. **Figure 3.1**).

Just after the turn of the millennium there are precious few sources describing developments in the Near East (cf. 3.4.1), but when the veil lifts, Amorrites were seemingly in control of dynasties across the region (cf. 3.4.2), and the Sumerian *mardu* determinative had nearly gone out of use in the textual material. Rulers with Amorrite names had by this time been dynastically installed in most major cities or states, including Mari, Babylon, Ešhnunna, Isin, Larsa, Qatna, and Yamhad. In addition, these rulers were also generally some way down the dynastic line and often proudly claimed Amorrite affiliation or ancestry (Wossink 2009, p. 125). For instance, Hammurabi had followed a number of predecessors with Amorrite links on the throne of Babylon, and the same was the case in Isin and Larsa at the time, while the Sim'alite Lim dynasty – Yagid-Lim, Yahdun-Lim, and Zimri-Lim (cf. 3.4.2.2 and 3.4.2.3) – claimed the Mari throne after a number of late *shakkanaku* rulers with Amorrite names (cf. e.g. Porter 2012, p. 29, table 2; Wossink 2009, p. 125). Names of tribal groups also appear in royal titles or in claimed or constructed genealogies as legendary ancestors of kings. These ancestors often carry names very similar to known tribal names. This is not unsurprising, taking into account the common practice regarding tribal identity of kinship via descent from forefathers of legend (Porter 2012, p. 269 – also cf. 5.1.2.2). There are two well-known examples of such lists – the AKL (cf. 3.1.1) and the Genealogy of the Hammurabi Dynasty (GHD) – both of which claimed Amorrite origins, and shared a number of names, including seventeen initial "ancestors" which are labelled "kings who lived in tents", thought in fact to be references to tribes. The AKL is associated with the ancestry of Šamši-Addu (cf. 3.4.2.2), while the GHD obviously is linked to Hammurabi and Babylon. Some of the shared attestations of the lists are names such as *Heana/Hanu* and *Ditanu/Didanu*, which parallel the *hana* extensively occurring in the Mari texts, and the Ditanu known from Ebla, thought to equate with the later tribal group Tidnum. Additionally, certain early names in the GHD – e.g. Amnanum, Yahrurum, and Numha – are well-known tribes during the Mari period (cf. Finkelstein 1966, pp. 95-96, 98-101; Larsen 1976, pp. 34-35; cf. also Fleming 2004, pp. 159-160; Wossink 2009, p. 125; 2013, p. 264 – cf. 5.3.2.2 and 5.3.2.3).

#### *5.3.1.2 The concept of mirror toponomy*

Until recently, scholars working with both Near Eastern epigraphy and archaeology believed the developments during the latter part of EBA IV and the picture of total Amorrite dynastic dominance in the MBA was the result of an actual physical migration and take-over by Amorrite groups throughout the region as part of the EBA-MBA transition (e.g. Charpin 2004, p. 67; Buccellati 2008). One recurring argument for the physical passage of Amorrite groups at this time is a particular phenomenon seemingly associated with it, called *mirror toponomy* (cf. Charpin 2003). Essentially, it refers to the occurrence of numerous parallel place names (homonyms) found across the region, but more strikingly, two or more areas separated from each other by significant geographical distances with a number of nearly identical toponyms – i.e. "sets" of homonyms found as far from each other as the Jebel Sinjar area and the Larsa polity in southern Mesopotamia (cf. **Figure 5.11**), both where two groups of six identical place names were found. Such groupings seem to have a tendency to be oriented around axes of symmetry, such as mountain ranges or rivers. Both sides of the Tigris have for instance a set of five homonymic settlements (cf. **Figure 5.11**), while both north and south of Jebel Sinjar were found two each of Sidqum, Saphum, and Apu(m). The latter toponym is also known as far away as the Damascus region, but with the meaning being "reed beds", the repeated occurrence may be due to coincidences brought on by the natural topography. Similarly, four repeated attestations of Dêr (encampment) or iterations of Hasur (enclosure) could be contextually explained by general situations, although the former of these are twice found in combination with a water way called Balih – on the well-known Jezire river (cf. **Figure 2.1**) and in proximity to a wadi near Mari (see below). However, the attestation of identical sets of homonyms found in areas which also carry identical names associated with tribal groups is a striking phenomenon. This was the case for the Larsa/Sinjar example mentioned above, which both are called Yamutbal, a well-known Amorrite tribe (cf. 5.3.2.3), while a similar duplications of area names seem to have been attested for Ida-Maraš and Numha. The area around Maškan-šapir (modern Tell Abu Duwari) was also linked to the Yamutbal (Porter 2012, p. 312). The tribal names Yahrurum and Amnanum, both first-degree subunits of the Yamina confederacy (cf. 5.3.2.2), were associated with two areas each, while Yapturum, a Sim'alite tribal group (cf. 5.3.2.1), was linked to both the Talhayum area and the easternmost Habur triangle. Finally, the Mutiabal, probably a clan under the Yaminite Rabbum tribe (cf. Durand 2004, p. 158), were found around Kazullu as well as on the Balih (Charpin 2003, pp. 10-16; Durand 2004, pp. 123-128). These are just a few examples of a multitude of recurring names found in parallel combinations across the Near East, both regarding localities and regions.

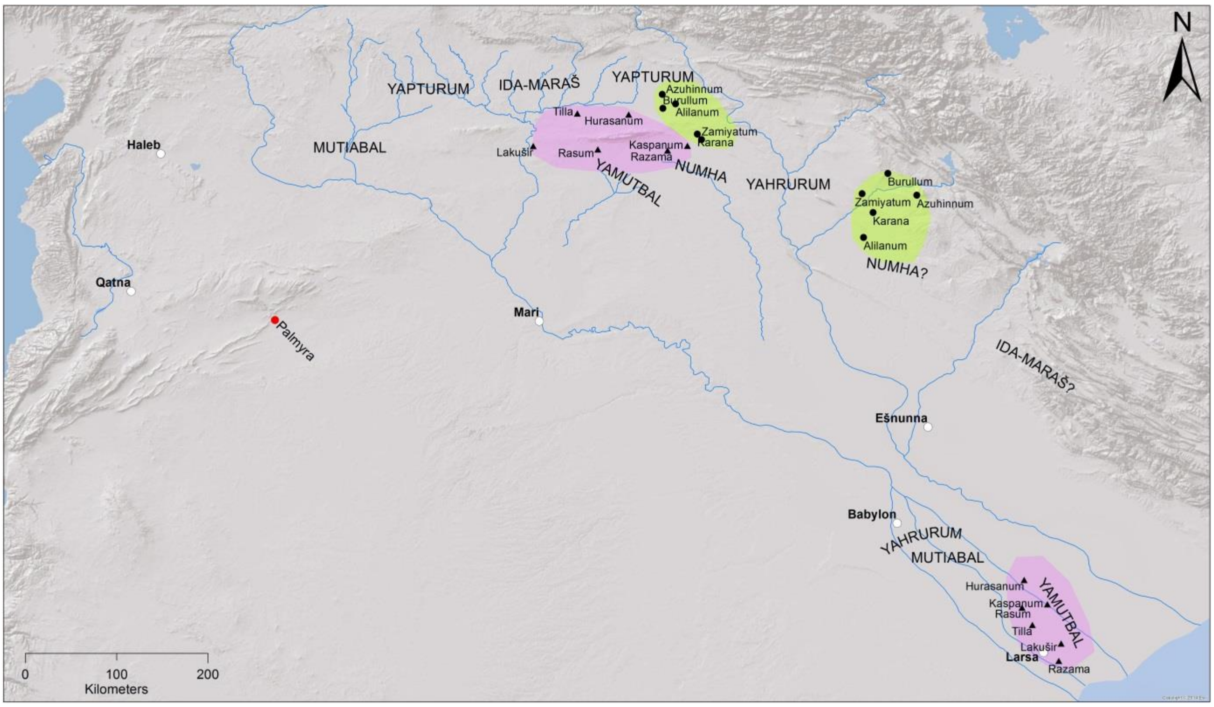



**Figure 5.11:** Names of areas and settlements known to have one or more duplicates, constituting examples of the *mirror toponomy* phenomenon of the Near Eastern MBA. Certain regions found far apart evidently also included parallel sets – marked with green and purple – as well as having similar regional affiliation (e.g. Yamutbal).

Generally, the settlement toponyms in this map have only been placed in an approximate fashion within their regions for purposes of context, and are not to be seen as precisely located (cf. text for references).

Explanations for this phenomenon vary, although they all mainly focus on an element of mobility. In his synthesis on the current state of knowledge regarding mirror toponomy, Charpin (2003, pp. 15-18), listed the known examples from the Mari archive, as well as ruling out a few names as "false" mirror toponyms – i.e. names that *seem* to be identical with other toponyms, but through linguistic examination in reality have been found not to be mirrored. He presented four interpretations on several levels for the occurrences of identical place names in the Near East:

a) Coincidence, i.e. descriptive toponyms like the iterations mentioned above. However, Charpin argued that since mirror toponyms were not known prior to the early 2$^{nd}$ millennium BCE, they do seem to be contemporary with what he termed "the Amorite dissemination across the Near East" and should probably therefore be linked to that event.
b) The result of deportations carried out mainly by Šamši-Addu, of which he remarked there are obvious examples, albeit very few, and thus cannot explain the phenomenon itself.
c) Grouped constellations associated with identical area names (cf. **Figure 5.11**), seemingly establishing links between two different regions possibly in relation to synchronous double-territorial belonging for a tribal group.
d) Place names may, as alluded to under the first point, be associated with a migration of Amorrite groups across the region in the late 3$^{rd}$ and early 2$^{nd}$ millennium BCE, renaming points in the landscape according to their traditions and original homelands. Charpin emphasised the examples in the third point, as many of the mirrored area names are in fact also known tribal names in the Mari archive.

While the first three interpretations only seem to work in a limited number of cases, the "Amorrite migration" explanation is the one Charpin believed to be the main mechanism for mirror toponomy. To further support this, he pointed to the immediate area around Mari, and the combination of Dêr and Balih, which could not be coincidental. Rather he thought it was associated with the Sim'alite arrival at Mari in late MBA I (cf. 3.4.2) as part of a migration, constituting tribal links to their original point of departure in the Jezire near the Balih river. Dêritum was an important deity for the Lim-dynasty, and Dêr at Mari is known to have been the focus for annual religious ceremonies (cf. Charpin 2003, p. 17). He put mirror toponomy in context with late 3rd millennium BCE abandonment of a number of sites, presumably as many segments of the population turned to mobile strategies faced with climatic deterioration. As some of these groups resettled in other areas, new sites were named, while the original ones were still remembered and acknowledged (Charpin 2003, pp. 18-19).

Wossink (2009, p. 133) argued against this interpretation, favouring rather that the duplication of toponyms was a mechanism for reinforcing shared social identity over longer distances, an explanation which Porter (2009) originally presented (see below). Additionally, rather than an actual sudden increase in new place names, he argued that it in fact is a *perceived* increase which is experienced by modern scholars mainly due to the explosion of information received and inferred from the Mari archive (cf. 3.2.2 and **Table 5.3**). The historical geography from this corpus, as well as a few other small collections of contemporary texts, is exceptionally well-known, and the geographical reach of the content is vastly larger than that of earlier periods. This argument was backed up by recently emerging evidence of the mirror toponomy phenomenon possibly occuring prior to the 2nd millennium BCE, thus weakening the large-scale migration interpretation. Porter (2009) focused on the tribal aspect, again with the Yamutbal example emphasised as particularly striking. She believed that mirror toponomy was a result of kinship mechanisms, e.g. for maintaining access to resources such as grazing territory, as the southern Yamutbal was not located in prime areas for pastoral exploitation and perhaps needed, or even claimed, the Sinjar region as *nighum*. The origins could have been a migration, with one part staying behind and another moving, but could also have been part of a traditional seasonal migration for pasture, as these groups incorporated both a sedentary and mobile component. The mirror toponyms could in such circumstances function as geographical representations of shared kinship and descent, and act for separated groups of the same tribal affiliation to overcome temporal and spatial distance through ideology (Porter 2009, pp. 204-205). She followed up this argument by pointing to the specifically Sim'alite association with Dêr and Balih, known from Mari texts as a central notion in rituals focused on descent, reciprocal rights, and tribal obligations, ceremonially binding together members of that particular tribe across the region (Porter 2009, p. 207). In her most recent work, Porter (2012, pp. 312-313) contextualised the mirror toponomy phenomenon into the many dualities of the Near Eastern Bronze Age society which have been emphasised in recent years – town and country, mobility and sedentism – suggesting that it should be analysed with such relationships in mind. She did not necessarily support explanations featuring directional migration, as proposed by Charpin (2003), nor thought any secure starting point or “Amorrite origins” for such a development had been located. Instead she proposed that e.g. both Yamutbal regions may have been two ends of the same territorial range, which by the Mari period had been separated into two independent areas, but with kinship keeping this tribe together across time and space by geographical representations in the form of mirror toponomy (Porter 2012, p. 318).

In my view this was probably not just a specific feature of the Sim’al or Yamutbal, but rather part of a general structure based on tribal organisation for coping with group affiliation in a world where smaller groups may have been separated from the main population of various reasons, but mainly through seasonal practices of mobile pastoralism. Grazing being a limited resource in a world filled with pastoralist groups, the ability to claim tribal territory would have been necessary to cement in a number of ways, and one of these could have resulted in the phenomenon scholars call mirror toponomy. Both the sedentary core areas in the river valleys and the grazing areas for the mobile season could in this way have been seen as two sides of the same ancestral territorial right. Thus, to me Porter’s view appeals the most, although Charpin’s third point definitely also has merit as a dominant factor. Exactly when this phenomenon arose, and whether it remained roughly the same from the EBA to the Mari times, is more uncertain. However, I do concur with Wossink that while we should acknowledge the unique window provided by the Mari archive, we should definitively entertain the notion that what it shows us does not represent a spatiotemporally unique context in an EBA-MBA reality.

#### *5.3.1.3 Amorrites and tribal identities*

How can we then explain the explosion of Amorrite names and affiliations across the region by the time of the Mari archive, if not by migration and population replacement? By looking at ethnicity as a fluid form of identity, Wossink (2009, pp. 129-136) suggested an alternative perspective which may go some way of explaining these developments, as well as conundrums associated with them. His approach was based on Barth’s (1969, pp. 9-10, 13-14) highly influential work, in which ethnicity is perceived as an active identity maintained by those who ascribe to it, particularly for purposes of interaction with other groups. It is called the instrumentalist view and constitutes the dominant paradigm in such studies (cf. Wossink 2009, p. 129). Barth argued that when faced with demographic pressure:

*“Migration and conquest play an intermittent role in redistributing populations and changing their relations. But the most interesting and often critical role is played by another set of processes that effect changes of the identity of individuals and groups. (…) Boundaries may persist despite what may figuratively be called the ‘osmosis’ of personnel through them”* (Barth 1969, p. 21).

Demographic pressure can be caused by a number of processes, one of which is climatic and/or environmental deterioration, particularly in a region vulnerable to such variations, like the Near Eastern arid zones. Studies of names in MBA societies have revealed a significant minority of instances where families consisted of parents with Amorrite names, but the children are given Akkadian ones, or vice versa. There were also examples of Amorrite combinations with Hurrian or Sumerian, although the majority consisted of families where both parents and their children carried Amorrite names (also cf. 3.2.6 and **Figure 3.3**). It is possible to discern certain geographical tendencies, with the area from Mari to Emar having highest percentages of Amorrite names (78 %), the western regions including Haleb, Qatna, and Karkemiš having nearly the same portion (75 %), while certain sites in the Habur triangle toward the Tigris only showed 11-36 % Amorrite names (cf. Wossink 2009, pp. 128-129). Apart from the evidence of strong regional presence of groups or individuals affiliated with Amorrite identity and geographical variations incorporating other ethnicities, these data also support the notion that ethnicity could have been a fluid concept also in the EBA and MBA periods (Wossink 2009, p. 133). Text **5.1** (cf. 5.2.1.1), in which the inhabitants of Dabiš mentioned their original affiliation and *hibrum*, is an example of precisely such a process in practice during the MBA. The text continued with these words:

**Text 5.18:** (…) We are native to the Yahruru. Let us now come into the midst of the Sim’alites as part of the Nihadu tribe [or clan, cf. 5.3.2.1], so that we may slay a treaty donkey (cf. Fleming 2004, p. 63 – my clarifications in brackets).

It is clear that the population of this Yaminite *alum*, who formerly identified themselves with the Yahruru tribe, carried out a conceptual osmotic transfer under official auspices to become part of the Sim’alite Nihadu clan (cf. Fleming 2004, p. 49; Wossink 2009, p. 133). Ethnicity as identity has thus been shown to be flexible and adaptable, both evident in anthropological studies (e.g. Barth 1969) and in texts from the Mari period, without any population displacement necessarily being part of the transformation. Wossink linked this development to the importance of pastoralism in the MBA world, which represented the core of Amorrite identity, and suggested its adoption must have been associated with certain advantages. One incentive may have been access to an extensive social network incorporating populations practicing both mobile and sedentary strategies, which all these dynasties incorporated as part of their *matum*, as well as was stretching across two or more environmental boundaries (cf. Wossink 2009, pp. 135-137). He argued that increased specialisation in the pastoral economy from mid-3rd millennium BCE may have had some association with the increase in Amorrite affiliations near the EBA-MBA transition, possibly intensified as a mechanism for alleviating stress due to environmental changes across the Near East in the final quarter of the millennium (Wossink 2009, p. 146; 2013, p. 261). Wossink concluded:

*"Through this identity, Amorites could create an extensive exchange network that was organised along constructed or perceived kinship lines and based on ethnic solidarity and more generalised reciprocity than would be possible among ethnically differentiated groups. The Amorite identity and its associated values and the social network it embodied represented a behavioural alternative that could be implemented under certain circumstances (…). Eventually, this adaptive advantage not only allowed Amorite groups to be more successful than their competitors, but would also generate an ethnic shift toward becoming Amorite, eventually resulting in the patchwork of Amorite kingdoms that can be observed for the early second millennium BC"* (Wossink 2009, pp. 146-147).

| | self-identification | ascribed identity | shared traits |
|---|---|---|---|
| pre-Ur III | - | +/ - | - |
| Ur III | - | + | - |
| early 2nd millennium BCE | +/ - | +/ - | +/ - |

**Table 5.3:** Available evidence for Amorrite identity from in the Near Eastern EBA-MBA periods, where + indicates strong evidence, + / - indicates some evidence, and - indicates very little or no evidence (after Wossink 2009, p. 131, table 7.2). Only in the MBA, mainly due to the Mari archives, do we have an extensive picture.

Both these theories – Porter's *mardu* as a generic term during the EBA, and Wossink's "Amorritism" as a flexible and adoptable identity in the MBA – are very intriguing in an EBA-MBA Near Eastern context, and quite different from the until recently general, and sometimes literal, understanding of contemporary textual sources. However, in my view they do seem to fit well with the picture these texts convey, especially because they can be applied to the material without the emergence of any major paradoxical conundrums. While Charpin and Durand, the editors of the Mari archive publications, during the 2000s continued to invoke some form of momentous migration event to explain the Amorrite emergence around the turn of the millennium (Durand 2004; Charpin 2004), they also seemed to emphasise the reality of a perceived regional identity starting in the MBA and apply more complex models when explaining the unfolding of these regional developments than did earlier invasionist theories (cf. 5.1.1.1). Another scholar which delved into the question of Amorrites, but still continued to conclude along the lines of such early interpretations, was Buccellati (e.g. 1988; 2008). His starting point was that it is

*"(...) part of the generally accepted scenario that the Amorites were a very distinct group (...) from the populations of the river valleys (...) rooted in their historically having hailed from an equally distinct geographical region, the steppe if not the desert. In other words, they were nomads at the origin, and they went through a progressive series of developmental stages that led eventually to their complete sedentarization"* (Buccellati 2008, p. 141).

This may have been the scholarly consensus when he originally (cf. Buccellati 2008, p. 141, note 1) developed his model of "domestication of the steppe", which entailed a "nomadisation" of sedentary cultivators in overpopulated river valleys along the middle Euphrates and lower Habur in early EBA, followed by a systemic organisation and movement toward total autonomy from their origins in the *zor* in mid-3rd millennium BCE. According to the model, these finally the returned to their "original homelands" in the urban zone as invading Amorrites, having developed their own distinct culture and identity, and conquered the river valleys and alluvium around 2000 BCE (cf. Buccellati 2008, pp. 142-143). However, this is based on a presumption that seems unlikely following some of the arguments presented above (cf. 5.1.3.2 and 5.2.1.2). It would require that mobile pastoralists could have stayed in the steppe indefinitely, which Buccellati argued would have been possible through the development and utilisation of a network of wells aimed at a shallow water table, as well as claiming that pasture would have been sufficient even during summer (Buccellati 1988, p. 45; 2008, pp. 142-143), a notion with which I disagree. Both recent and ancient sources suggest that mobile ovicaprine pastoralists in Syria had to return seasonally to the river valleys or areas receiving more precipitation in the annual cycle due to the desiccation of the arid zones. However, I will accept that during parts of the 3rd millennium BCE, favourable climatic and environmental conditions may have allowed perennial habitation in the steppe, although probably not continuously throughout the centuries as conditions clearly fluctuated (cf. 2.4 and 2.5). Secondly, it would mean that they could practice their mobile lifestyle without the dependence on products from the sedentary zone, which most studies of ovicaprine pastoralism argue not to be the case. Admittedly, Buccellati argued that his model in fact related to the origin of tribes, where kinship rooted in the river valleys as an alternative to their attachment to city-states was the bonding factor and not territorial contiguity. He proposed that the "nomadisation" was not permanent, as the mobile groups would retain strong ties to their roots in sedentary areas (Buccellati 2008, pp. 143, 150). Both of these latter aspects seem reasonable, and also form part of my view of the socioeconomic organisation formed around tribal structures. However, it also seems to somewhat contradict the wholesale adoption of steppe life and millennium-long diachronic development of disattachment from the *zor* and movement toward political and especially military independence. Additionally, the subsequent "invasion", which Buccellati upheld as part of his explanation, would have necessitated some form of military superiority established during the EBA among mobile groups in the steppe, even though they probably were outnumbered and had not discovered the factor that later became the trump card of mobile groups – mounted warfare (cf. 5.1.1.1). A final point in Buccellati's theory to which I definitely do not adhere, is his view of a steppe "*proven singularily sterile*" regarding material culture linked to mobile groups of the period (Buccellati 2008, p. 154). Clearly, thousands of tumuli, of which those with chronological data point to a date in the EBA-MBA, attest to the opposite. Although, Buccellati qualified his argument by focusing on sites which he specifically termed "Amorrite", I believe this is beside the point. It will always be nigh-on impossible to unequivocally attach structures or other material culture to a specific ethnic group, although some have tried (e.g. Lönnqvist 2008 – cf. 4.7.2), but to not acknowledge the vast amounts of material remains located in the area on which your theory concentrate (cf. 4.5.3, 4.5.4, and 4.5.5), seems almost rash. Particularly since Buccellati (2008, p. 155) emphasised the effort by Porter (2000; 2002) to link mortuary monuments to tribal territory and social identity, but still managed to survey large parts of the Palmyrene and Jebel Bishri in the 1960s without finding any of the thousands of tumuli in the area worth recording or even noticing himself (cf. Buccellati & Buccellati 1967), even in hindsight. Their focus during this survey seems to exclusively have been on sedentary sites or tells in the steppe. Streck (2002, pp. 189-190) also found Buccellati's model too far-reaching, due to the sparseness of evidence for such a development, as well as the dependence of mobile pastoralists on products from the cultivated zone, although the majority of his counterarguments were related to linguistic aspects.

In accordance with both Wossink and Streck, I would also argue that the sparseness of contextual evidence surrounding mobile pastoralists and their role in the Near Eastern social, economic, political, and environmental landscape prior to the Mari period should caution against both far-reaching and dramatic conclusions. There may indeed have been some population movements involving mobile pastoralist groups during the EBA IV, in fact it seems fairly likely that it were, in as much as that is what pastoralists do – they move about in both short- and long-term perspectives (Porter 2012, p. 319). Acceptance of Porter's interpretation that *mardu* during the EBA in fact carried similar meaning as *hana* in the Mari archive, i.e. "our mobile groups" would solve some of the problematic contradictions associated with this term – e.g. the occurrence of several areas designated **kur** *mardu* (cf. 5.3.1.1 and **Figure 5.10**). It was not usual to identify people in the record by homeland or language, but through what they did, thus Porter concluded that common EBA usage of *mardu* referred to people who defined *themselves* as mobile pastoralists. Earlier research could not combine an urbanised Mesopotamian world integrated with pastoralists, and thus had the latter labelled as outsiders, often hostile. However, in Porter's hypothesis there is social and economic immersion, where parts of the family may live in an *alum*, while others may be roaming as pastoralists, both being part of the same polity, whichever that is, and/or the same ancestral group, i.e. tribe (Porter 2012, pp. 318-322). As the narrative moved into MBA (cf. 3.4.1 and 3.4.2), this particular Amorrite identity, how individuals or groups thought of themselves in interaction with others, became more conventional and inclusion into the Amorrite network could have been an adaptive strategy due to significant social or political advantages coming with such a shift, as Wossink (2009) convincingly argued. While some dynasties, which of course may have been founded by merely one group or even individuals, could have been Amorrite in origin and actually been harking back to eponymous tribal ancestors of such stock, it seems too disruptive to envision an upheaval across the region around 2000 BCE, ousting people from their homeland through a hostile takeover. Although certain instances of demographic shifts may have occurred over time (cf. 3.2.6), cultural variations centuries apart do not necessitate any large-scale movement of people, notwithstanding the very limited nature of EBA textual evidence in many parts of the Near East. Political changes occurred regularly (cf. 3.3 and 3.4), which they also did during the MBA, but Amorrite values and ideology emerged in this period to dominate the social and political arena in large parts of Syria and Mesopotamia.

To me it seems more likely that the Near East carried on along the same line it had at least for centuries, with small and large tribal groups including sedentary cultivators and mobile pastoralists, interacting with each other and the landscape in the same way as is evident from the Mari archives (cf. 5.3.2 and 5.3.3). This notion is supported by the *merhum* who wrote to Zimri-Lim in text **5.2**, claiming that grazing lands of the Yaminites had always ("since forever") been the Syrian plains, while the corresponding area for the Sim'alites had always been Habur triangle (cf. 5.2.1.2 – cf. **Figure 5.12**). Perhaps e.g. the mirror toponomy phenomenon actually is a window on an operational or recently bygone territorial structure with regard to traditional tribal pastures, i.e. cyclical annual migration, rather than reflections of large-scale unidirectional and violent migrations? It is in my view certainly a possibility that two areas with several identical toponyms may have constituted two ranges – one semi-sedentary summer area and one for mobile winter pasturing – belonging to one tribe, for instance the Yamutbal or Numha (cf. **Figure 5.12**). Again, we have to realise the limitation of our body of evidence, and the fact that large parts of the EBA-MBA world are lost to us – at least unless another corpus similar to the Mari archive is discovered. Instead, I think the sometimes mundane patterns evidenced from Mari should influence our perspective of the Near East also prior to c. 1800 BCE. As Streck (2002, p. 192) has argued, there is no direct evidence for fundamental changes in Amorrite lifestyle or habitation from the 3$^{rd}$ to the 2$^{nd}$ millennium BCE. It should rather be seen as a specific strategy adapted for the ecological and climatic conditions of the steppe and the river valleys.

While the amount of evidence on these issues may be intermittent, ambiguous, or severely biased for the much of the EBA and the beginning of the MBA, we have access to a great deal more information regarding mobile pastoralism (cf. 5.2.1.2), and tribal organisation and the geopolitical structures (cf. 5.2.1.3) of the region during the first half of the 18$^{th}$ century BCE from Mari, to which I now return. There were four main tribes or tribal confederations of clear Amorrite affiliation, which again seem to have been grouped in two pairs for reasons of rough geography and presumably consequently also competition. These tribal pairs (cf. **Figure 5.13**) were the western-oriented Sim'alites and Yaminites (5.3.2.1 and 5.3.2.2), mainly located in Syria and along the Euphrates and Habur river valleys, and the eastern-oriented Yamutbal and Numha (5.3.2.3), which were located around Jebel Sinjar and down along the Tigris river valley. Of these, the Mari dynasty associated itself with the Sim'al, while Hammurabi and Šamši-Addu both had affiliations with the Numha tribe, although neither ancestry nor demography was clear-cut – Yaminite groups did exist in south Mesopotamia and Yaminite (actual or adopted) tribes were part e.g. of Hammurabi's ancestry (cf. 5.3.1.1) . However, as our source of information was Mari, we rely principally on the perspective of its scribes and authorities, which mainly gave priority to relations between Yaminites and Sim'alites and their world. Finally, there were the other tribal populations, mostly peripheral fringe groups only mentioned in passing, like the Turukkeans and the Lullu far to the northeast and of which we know very little (e.g. Durand 2004, p. 133). But one intriguing outsider group appears fairly frequently in the Mari texts – the Suteans (or Sutu) – and will thus also be discussed below (cf. 5.3.3).

### 5.3.2 The tribal world of the Mari archive

Earlier in this chapter I have referred to the tribal groups of Yamina and Sim'al[26] several times, and exemplified a number of concepts regarding mobile populations and tribal structures by inferring from Mari texts regarding their practices. These two groups feature heavily in the Mari archive because they constituted the vast majority of the population under the kingship of Zimri-Lim in the 18$^{th}$ century BCE, although the various Yaminite tribes also recognised their own *šarrum* and *matum* (cf. 5.2.1.3 and **Table 5.1**). They were considered a duality in the Amorrite tribal organisation (cf. **Figure 5.13**) and have been described as structured along the Euphrates as an axis with regard to their traditional pasturages (Joannès 1996, p. 335). From a Mari perspective, this is a fairly accurate assumption, although we cannot be certain that the archives present an exhaustive picture, even though in questions relating to Yaminites and Sim'alites during the MBA, it is richly furnished. Other tribal groups, like the Numha, Yamutbal, and Sutu, are more haphazardly attested in these texts, but one has to keep in mind that it is purely the Mari perspective, in both geographical and administrational terms, that is provided to us – with all its advantages and disadvantages. While I juggle with terms like sedentary habitation, *matum*, *nighum*, and kingdoms, I still maintain that the geopolitical structure in the period was mainly based on settlements as hierarchical nodes with routes between them and rangelands for pasture around them (cf. 5.2.1.3), with populations and leaders being the basis of control, not territorially bound states.

26 Also called (binu or DUMU meš) Sim'al and (binu or DUMU meš) Yamina, meaning "sons of the left (hand)" and "sons of the right (hand)" respectively (e.g. Luke 1965; Fleming 2004, pp. 9-10), or sometimes somewhat inappropriately Bensim'alites and Benjaminites, particularly among French scholars (e.g. Joannès 1997; Charpin 2004; Durand 2004 – cf. Fleming 2004, p. 14 for arguments against such usage).

#### *5.3.2.1 The Sim'alites*

The Mari kingdom had its tribal base in the Sim'al tribe or tribal confederation, and Zimri-Lim was their king (e.g. Fleming 2004, p. 24). Before him, in the late 19$^{th}$ and early 18$^{th}$ century BCE, they had followed Yahdun-Lim and Yagid-Lim (Durand 2004 – cf. 3.4.2.2). All Sim'alites were members of one of two tribal branches – the Yabasa or the Asharugayum – what Fleming (2004, p. 43) called "divisions", but others have defined as tribes (*li'mum*) (e.g. Durand 2004, p. 182 – cf. 5.2.1.3), similar to the five tribes of the Yamina confederation (see below). For the sake of simplicity regarding tribal structure, I will here mainly follow the short synthesis and description presented by Durand (2004, pp. 182-184). There seems to have been certain intriguing differences between these two tribes, particularly in the context of mobile pastoralism and tribal organisation. The Yabasa (literally "arid lands") contained four known clans (*gayum*), whose names included Yabasu ("dry"), Kasum ("people of the steppe"), and Abi-Nakar ("my father is/was of a foreign clan"), thus suggesting associations with both mobile pastoralism and a flexible tribal organisation. Durand (2004, p. 196) proposed that this tribe originated as a collection of ancient clans situated on the fringe of the main ancestral group of the Sim'al, thus in Mari times constituting its own branch parallel with the latter tribe, which was the Asharugayum. The etymology of this division is more uncertain, but Durand speculated that its meaning might have been "people of the water". The six known clans under Asharugayum followed a different name pattern to that of the Yabasa, as they were named according to eponymous ancestors, such as the Nihadum (cf. text **5.1** and text **5.18**), the Yuma-Hammu, the Ibal-Ahum, and the Ki-Hibru-Ila, again a practice which is very common in Near Eastern tribal organisation (cf. von Oppenheim 1939; Barth 1961, pp. 50-52, 56-57). All in all, twelve Sim'alite clans are known from the texts, of which two have not yet been possible to definitively assign to any of the tribal divisions (Durand 2004, pp. 179, 182). Durand (2004, p. 130) also argued that there were some geographical variations between these two tribes, both in terms of sedentary settlements and pastures. This seems plausible, as the Yamina tribes were clearly organised along such lines. It is e.g. certain that the Yuma-Hammu clan inhabited several *alum* in Suhum, where the Haditha dam is today, as well as having their summer residences there (Streck 2002, p. 166; Durand 2004, p. 130 – cf. **Figure 5.12**). For instance, the inhabitants of the town Sapiratum (**Figure 5.12**, no. 10) belonged exclusively to this clan and 37 heads of Yuma-Hammu families are listed in a text as its population – thus not according to *alum*, but according to clan affiliation, following the general norm (Fleming 2004, pp. 201-202, also cf. p. 254, notes 83-84).

People belonging to the Sim’al tribe constituted presumably the large majority of the Mari kingdom, as Yaminites only made out about a quarter of its 40,000 strong population, excepting the areas of Qattunan and Suhum (Millet Alba 2004, p. 231). Sim’alite *alum* were spread along the valley from southern Suhum to the the area around the Habur confluence, and at least up to the middle Habur valley, while the summer habitation area of Sim’alite mobile groups probably followed the same distribution pattern (Streck 2002, pp. 164-165). Certain towns in the Ida-Maraš also seem to have harboured Sim’alite affiliation, such as Zalluhan (Yabasu – **Figure 5.12**, no. 18) and Šuna (Fleming 2004, pp. 90, 152 – **Figure 5.12**, no. 16), and it is possible that more distant Sim’alite *alum* also existed, like Dêr on the Balih (cf. Durand 2004, p. 236). However, according to the current state of evidence, the Sim’alite sedentary population was mainly confined to the Mari kingdom. On the other hand, the Sim’al mobile groups were very firmly associated with the banks of the Habur up to and including the extended Habur triangle, to where they seasonally migrated with their flocks of sheep and goats (i.e. entire *nawum*) each winter for territorial pasture. They seem to have had two main *nighum* in this region, probably associated with specific clans or perhaps the two branches, which were administered by one *merhum* each, reporting to the Sim’alite king. These areas were located in central Ida-Maraš, certainly associated with a long-standing claim, and the area around Jebel Sinjar, possibly extending to its southern foothills (cf. Heimpel 2003, pp. 31-33; Fleming 2004, p. 83; Durand 2004, p. 123). While Durand (2004, p. 118) proposed that this distribution may have been a recent development, following his view of the “Amorrite migrations” (cf. 5.3.1.2), Streck (2002, p. 188) argued that it was part of a much older settlement system of summer and winter residences, a view which I condone myself.

#### *5.3.2.2 The Yaminites*

There is also sufficient information in the Mari archives for scholars to be able to deduce the villages, summer habitations, and many of the tribal pastures of the Yamina. This tribal group was clearly organised as a confederacy containing five distinct tribes, which seems to be exhaustive regarding its members, confirmed by a list of the *li’mum* with their contextually current and separately governing kings (Fleming 2004, pp. 43, 67 – although cf. Durand 2004, p. 158). They could ally themselves against an external enemy, like three of them did vs. Yahdun-Lim, or be in conflict with each other, although not usually violently (cf. Fleming 2004, pp. 59, 62). The five Yaminite tribes (cf. Durand 2004, pp. 158, 173-174; Fleming 2004, pp. 45, 52; Heimpel 2003, pp. 15-17 – also cf. text **5.19**) were Amnanum, Rabbum, Uprapum, Yahrurum, and Yarihum, some of which have been mentioned occasionally previously in this study, and each of these were divided on a second-level tier into clans. One of these was the Mutiabal (cf. **Figure 5.11**), which in fact has by one scholar been grouped as a tribe with the other five (cf. Heimpel 2003, pp. 15-17). Fleming (2004, p. 317) on the other hand left them out of the Sim'al/Yamina duality altogether. While associated with at least two far-flung areas of the region, I find the proposition of Durand (2004, p. 158) most convincing, i.e. that they were a clan of the Rabbum tribe. Like the tribal structure of the Sim'al, other clans named after eponymous ancestors are also known, such as Ilum-Muluk, Ya'el, and Damiqan. Finally, it is from the Yamina confederation we get to know a third-level tier in tribal organisation, the "house of Awin" (cf. 5.2.1.3), households or families led by patriarchs, which presumably were ubiquitous components in all EBA-MBA Near Eastern tribes and clans.

Clearly, the Yamina conformed to the common pattern of tribal structures discussed above (cf. 5.2.1.3 and **Figure 5.7**). What is also certain is that each of the tribes had their own ruler (*šarrum*), their own royal centre[27], and each was considered a *matum*, although in the Mari period, the seats of two of the tribes (Uprapum and Yahrurum) were located within the *halsum* of Terqa and Mari itself respectively – areas directly controlled by Zimri-Lim. However, they retained distinct Yaminite identities and tribal loyalties (Fleming 2004, p. 33). More famous Yaminite centres were Tuttul (Amnanum) and Abattum (Rabbum), attested here in text **5.19** dating to the time of Yahdun-Lim:

**Text 5.19:** During the same year, La'um king of Samanum and the land of the Uprapum, Bahlu-Kullim king of Tuttul and the land of the Amnanum, (and) Ayalum king of Abattum and the land of the Rabbum – these kings went to war against him [Yahdun-Lim] *(...)* (after Fleming 2004, p. 153).

There are more uncertainties around the last tribe, Yarihum, but they may have been associated with western areas of Syria (cf. Heimpel 2003, p. 16). Additionally, as have been mentioned (cf. 3.4.1 and 5.3.1.1), several rulers of the MBA Near East claimed genealogies including Yaminite strains. All five Yamina tribes were associated with a number of *alum* within Ah Purattim, the central Mari kingdom, each of which was distinctly associated with either of them (cf. Millet Alba 2004, p. 232), and apart from the two tribal centres, the largest

27 A tribal "capital", although according to tradition rather than size, as e.g. Samanum, the central alum of the Uprapum tribe, was at most a town, with its 300 inhabitants (cf. Millet Alba 2004, p. 232). On the other hand, this made out about a quarter of the whole Uprapean population in the Mari kingdom.

of them were governed by a *sugagum* responsible to the Mari king (Fleming 2004, p. 52). However, most of the Yamina population was located outside this kingdom and thus much of our perspective, but some information has been possible to discern, e.g. a lasting Yaminite affiliation among the Zalmaqum kings around Harran (cf. **Figure 3.1**), and an association with the twin cities of Sippar, which included Amnanum and Yahrurum as part of their toponyms (**Figure 5.12**, no. 12). Western Syria, western Jezire, and the plains of Yamhad also seem to have harboured significant Yaminite populations (e.g. Streck 2002, pp. 163-164; Fleming 2004, pp. 28-29; Durand 2004, pp. 158, 173-174).

Like the other tribal groups, the Yamina confederation incorporated a significant mobile component (the *hibrum*, cf. 5.2.1.1), each with its traditional *nighum* for winter pasture. Many of these are known from Mari texts, one of which (the Uprapean, cf. Charpin 2010, p. 240) definitely bordered onto Jebel Bishri and the Palmyrene (**Figure 5.12**), if not actually stretching into these areas. Already Luke (1965, pp. 73, 248) noted Yaminite *nighum* along Balih toward Zalmaqum, with which kings they therefore depended on good relations and probably also were tribally affiliated with, as well as in parts of the Syrian steppe, while Matthews (1978, p. 56) argued Yaminite groups pastured their flocks extensively in Jebel Bishri. However, Yaminite livestock pasturing in central parts of these highlands was later described to be a one-off event, and not part of the traditionally reconised pattern (cf. Streck 2002, p. 63). Durand (2004, pp. 167-169) listed the five tribes, their known kings, and their attested pasture territories, which is reflected in **Figure 5.12**. Most of them did at some point pasture in western Syria, although I suspect the appearance of Uprapeans near Qatna could have been due to their *nighum* arcing from the Balih confluence with the Euphrates, along the northern parts of the Palmyrene, to this region. Yahrurum seem to have pastured in western Jezire, while the Yarihum could have pastured in the region of Damascus. Otherwise, mobile Yamina groups seem to have grazed their flocks anywhere between the Balih valley and the coast outside the hot season, a pattern rooted in and cemented by tradition (cf. Durand 2004, pp. 167-169; Fleming 2004, p. 94 – also cf. text **5.2**). There are indications of several *merhum* operating as middlemen between these groups and respective authorities in these areas as well (Fleming 2004, p. 84), although as it did not concern the Mari palace, our knowledge on the topic is limited. It is in this context the letter sent by Šamši-Addu to his viceroy son at Mari, Yasmah-Addu, should be viewed (cf. text **3.4**), in which he urged him to get guides to counsel and help his army regarding the whereabouts of water points (*buratum*, also cf. text **5.3**).

Yasmah-Addu replied (text **3.5**) that he had to choose the upper route, presumably due to seasonal aridity, and therefore acquired Uprapean guides. Due to their *nighum* in the northern part of the Syrian steppe, their knowledge of this region was extensive and intimate. The starting point for these routes through the Palmyrene mentioned in this text have now to been clarified and were Abattum (upper), Dur-Yasmah-Addu (middle, near Deir ez-Zor), and directly from Mari (lower) (Charpin 2010, p. 241 – cf. **Figure 5.14**). Neither of these ancient routes have yet been fixed, but the two latter routes must surely have passed to the south of Jebel Bishri and ultimately through Palmyra (e.g. Joannès 1997; Charpin 2010). However, the direction of the upper route, while sometimes assumed to have gone south from Abattum, via Taibe and Suhne, to Palmyra, and onward to Qatna (c. 330 km in length), could also have passed through the northern Palmyrene via Resafa and Salemiye (c. 230 km in length). Charpin (2010, p. 241) argued in favour of the former route, but taking the probable Uprapean *nighum* into account – as well as significant differences in distance (i.e. about 100 km – cf. **Figure 5.14**) – I would suggest that the latter of these alternatives was the so-called "upper route", and the one chosen by Yasmah-Addu for his army. Of the three routes, this one was the one controlled by the Uprapum tribe (cf. Joannès 1997, p. 410), while the middle and lower route in my view basically fell within the pasture territory of the Sutean tribe (cf. text **5.12** and 5.3.3), to which Yasmah-Addu would have had to turn for guidance and information had he chosen one of those. However, before I turn to the Suteans, I will in short present aspects regarding the other two Amorrite tribes who generally inhabited areas east of Mari, to fill out the demographic picture of the Near Eastern steppes and river valleys during the MBA.

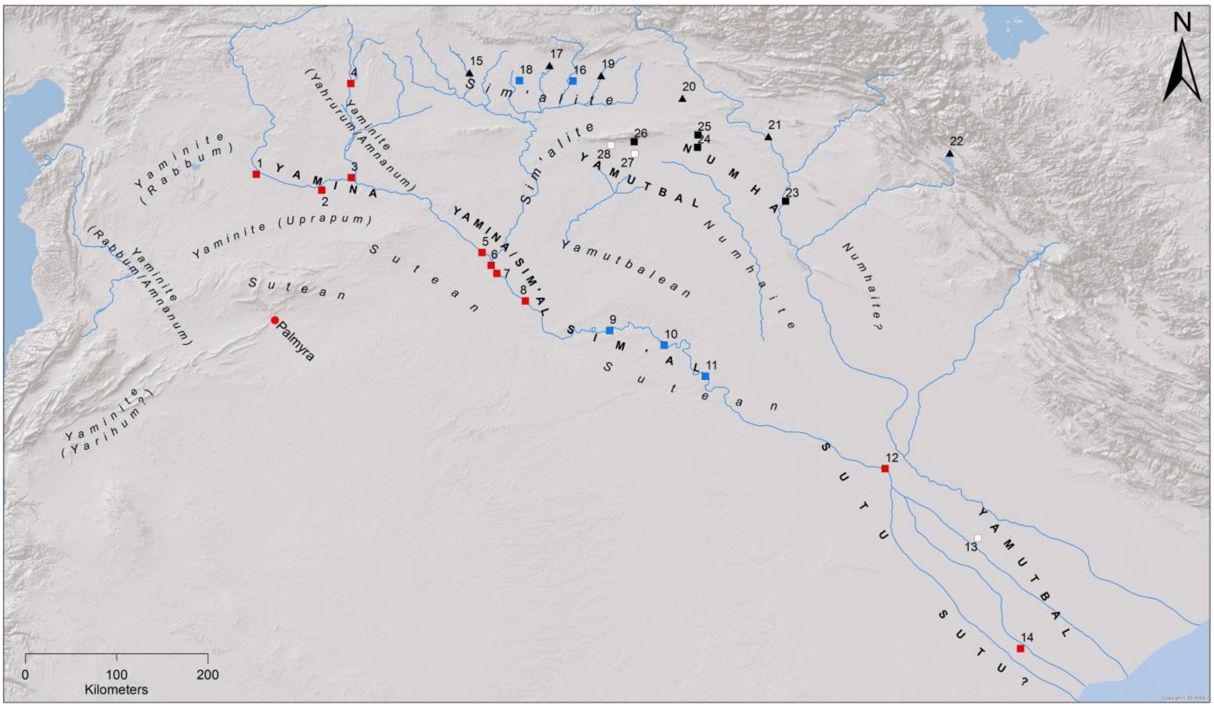



**Figure 5.12:** Map of selected known tribal affiliations of the Mari period, as well as indications of tribal territories for seasonal pastoralism. Sedentary tribal areas are shown in bold, while attested *nighum* are in italic. The *alum* numbered in the map are: 1) Emar, 2) Abattum (Rabbum), 3) Tuttul (Amnanum), 4) Zalmaqum (area), 5) Dabiš (cf. text **5.1** and **5.18**), 6) Dumtan, 7) Samanum (Uprapum), 8) Mišlan, 9) Harradum, 10) Sapiratum (Yuma-Hammu), 11) Harbe, 12) Sippar (Amnanum/Yahrurum), 13) Maškan-Šapir, 14) Uruk, 15) Talhayum (Yapturum), 16) Šuna, 17) Urkeš (Hurri), 18) Zalluhan (Yabasu), 19) Šehna/Šubat-Enlil (Hana), 20) Razama (Yussan), 21) Ninua (Turukku), 22) Šušarra (Turukku) , 23) Ekallatum, 24) Qattara, 25) Karana, 26) Kurda, 27) Andarig, 28) Razama (Yamutbal). Colour key: Yamina (red), Sim'al (blue), Yamutbal (white), Numha (black), other tribes (triangles).

### *5.3.2.3 The Numha and the Yamutbal*

The tribes of Numha and Yamutbal are not known in great detail (Durand 2004, p. 133), as they both were situated outside the direct control of Mari with their own kings, probably at least two each (e.g. Yamutbalean kings in both Andarig and in Larsa – cf. **Figure 5.12**). The two *matum* south and southeast of Sinjar did have some dealings with Zimri-Lim, most notably the Yamutbal, as their core areas partly overlapped with the *nighum* of Sim'alite groups. Numha and Yamutbal as tribal names probably stemmed from eponymous ancestors or unknown toponyms, although their clans are not known. However, both clearly incorporated a sedentary and a mobile component as parts of their tribal organisation (Joannès 1996, p. 354; Streck 2002, p. 166). The northern sedentary areas of Numha and Yamutbal are fairly well known. South of Jebel Sinjar, the Yamutbal centre was Andarig (probably modern

Tell Khoshi, cf. Heimpel 2003, p. 606), and their heartland there stretched from its western foothills and the east bank of the Habur, and about two-thirds eastward along the range, where it bordered with Numha lands (e.g. Heimpel 2003, p. 18). Perpetual rivalry or outright conflict between these polities regularly occurred, and they denoted each other as “enemies” (Joannès 1996, p. 354; Streck 2002, p. 178), probably both due to politics and tribal tradition. However, their relations with the Sim’al, whose mobile groups they had in their midst during winter and spring, were generally cordial (Fleming 2004, p. 31; Durand 2004, p. 133 – cf. **Figure 5.13**). The southward sedentary Yamutbal extension into the eastern Jezire steppe is less certain, but it probably stretched from the upper reaches of Wadi Ajij toward Wadi Tharthar (Joannès 1996, p. 349 – also cf. **Figure 2.1**). In addition, as has been repeatedly mentioned, the Larsa state in southern Mesopotamia also had affiliations with Yamutbal where it was known as Emutbal due to dialectical variations (Heimpel 2003, p. 18; Durand 2004, p. 133).

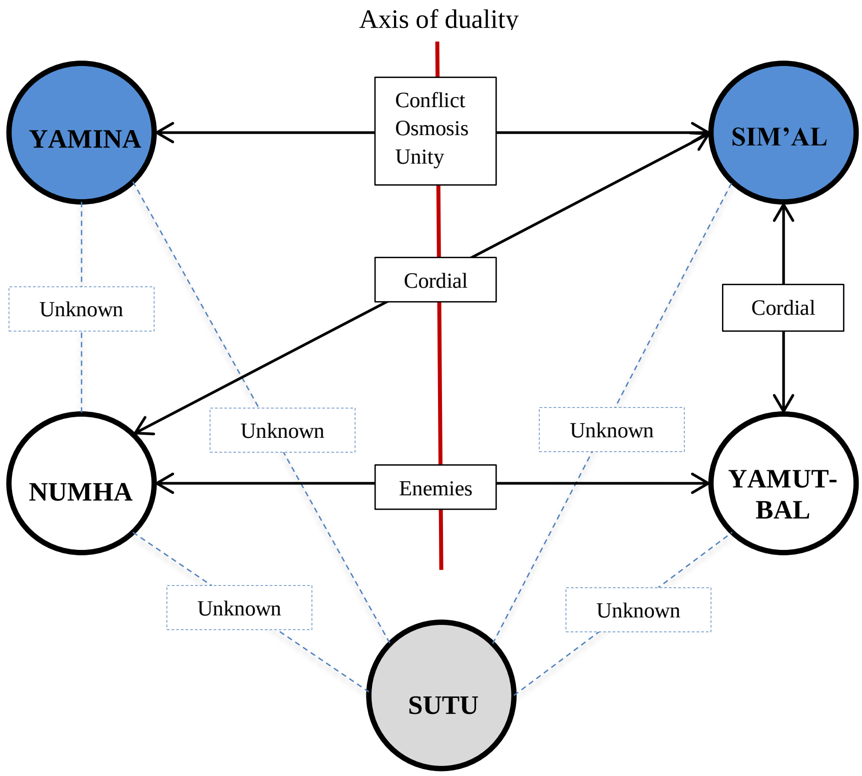



**Figure 5.13:** Tribal dualities in the Mari world (after Streck 2002, p. 177, abb. 4). While tribal competition or conflict between the dichotomised dualities Yamina/Sim’al and Numha/Yamutbal was both regular and widespread during the time of the Mari archives, these relations did not often seem to cross into the other respective duality. But there was also an understanding of shared ancestry within these dualities, and their ties could be quite complex (e.g. cf. text **5.18**). However, relations between the Sutu and the Yamina/Sim’al or Numha/Yamubal remain uncertain (although cf. 5.3.3).

We do not know much about the grazing territories of the Yamutbal, but if the pattern of Sim'al and Yamina is to be indicative of similar structures further east, it seems likely they also had their ancestral area for pasturing founded on claims in tradition and perhaps perceived divine allocation. The mobile pastoralists of southern Yamutbal (Larsa) could have had access to the same territories and rights as parts of the tribe or tribal confederacy, and their shared descent and kinship being reproduced and reinforced by replicating a geographical landscape through the mirror toponomy phenomenon (cf. 5.3.1.2 and **Figure 5.11**). Tentatively, Yamutbal seem to have had *nighum* somewhere in eastern Jezire, as mobile groups of both Yamutbal and Numha have been attested on the eastern banks of Habur and Euphrates during winter ("since last year", cf. Streck 2002, p. 166 – also cf. text **5.5**). The latter tribe, while equally obscure in this regard, could hypothetically had access to pastures east of the Tigris, following the same suggestion with regard to mirror toponomy. Although the traditional pasture areas for Numha at best remain hypothetical, the areas of their sedentary *alum* are more substantially documented. Sometimes divided by scholars into western and eastern Numha (cf. Joannès 1996, p. 350), their respective central settlements were Kurda (probably modern Balad Sinjar) and Karana (probably modern Tell Afar), the latter of which had been relocated from Qattara (modern Tell Rimah) in the Mari period (**Figure 5.12**, nos. 24-26). Thus, interestingly, all the three central settlements of the south Sinjar tribes or *matum*, if correctly located, lay within a mere one or two days travel of each other (Joannès 1996, p. 350; Durand 2004, p. 134), despite the apparent enmity between Yamutbal and Numha (**Figure 5.13**). The Numha lands stretched from Yamutbal east- and southeastward to upper Wadi Tharthar, and across and down the Tigris valley, with e.g. Ekallatum being populated by Numhaites, and Babylon at least having some affiliation with this tribe (Joannès 1996, p. 349; Heimpel 2003, p. 21; Durand 2004, p. 133 – also cf. 5.3.1.1). As the Babylonian dynasty has been shown to include both Numha and Yamina ancestry, Durand (2004, p. 134) argued that Numha belonged to the Yamina tribal confederacy. I agree that there seem to have been certain links between these groups, but have contended myself by placing them on the same side of the tribal duality in **Figure 5.13**. Similarly, the expressions used in MBA texts when Yamutbal and Sim'al relations are discussed seem to suggest a close bond "since days gone by" between these as well (Fleming 2004, pp. 31, 90 – also cf. note 25), justifying their position across such an axis of duality. However, integrated with this picture, but tribally situated outside it, were the Suteans.

### 5.3.3 Sutu and the Suteans

The Suteans were not the only tribe situated outside the Amorrite dualities of Sim'al/Yamina and Yamutbal/Numha in the MBA, as a number of other tribal groups are attested in the textual record (cf. 3.2.6). However, most, if not all of these were located along the fringes of the Near Eastern steppes. We know from Mari texts of Turukku, found east of upper Tigris, and associated with e.g. Ninua (Niniveh), as well as the Lullu located in the same region (cf. Heimpel 2003, pp. 20-21; Durand 2004, p. 133). Neither were they the only other Semitic tribal group (cf. 3.2.6). However, as far as I can discern, apart from the four main Amorrite tribes, they were the only relatively large population inhabiting extensive parts of the central Near East with which the Mari authorities had regular dealings. The reason for this was that Suteans every season moved through core areas of the Mari kingdom with their *nawum* on their way to their traditional *nighum*, generally believed to have been the Palmyrene dry steppe.

Although the Sutu feature much less frequently in the Mari archive than e.g. the Yamina and were not part of its *matum* (Durand 2009, p. 505 – cf. Luke 1965, pp. 107-111 for a list of Sutean attestations outside the Mari archives), certain aspects of their tribal organisation are nevertheless known. Their structure did incorporate *hibrum* (cf. 5.2.1.1), which presumably means the Suteans also had sedentary villages, although not in Ah Purattim. Like the more well-studied and better known MBA Near Eastern tribal groups, they were also divided into clans, of which at least five are known to date – Yahmamu, Allamutu, Mihalizayu, Bar-Halanum, and Bula/ila – with the first two of these described at Mari as "distant Suteans" (cf. Joannès 1997, p. 408). Whether or not they had kings is uncertain, as Suteans entering the Mari texts are in general mobile pastoralists on pasture, but they certainly had clan leaders like other tribes. Most appear briefly, like Abisare, Gazizanum, or Rabium, but the Sutean known as Hammitalu features repeatedly and was evidently active during the reigns of both Yasmah-Addu and Zimri-Lim (cf. 3.4.2.2 and 3.4.2.3). Hammitalu, Abisare, and Gazizanum were in fact orchestrating and leading the famous raid against pastures near Qatna attested in text **5.12**, but Hammitalu also led one of the Sutean *hibrum* accompanying the king of Kurda on his return from Babylon along the Euphrates, provided guides for an embassy from Dilmun (modern Bahrain), and generally enjoyed cordial relations with Mari authorities (Joànnes 1997, pp. 408-409). This is not surprising, as Sutean mobile groups were dependent on Mari for access to their pastures, just like the Sim'alite mobile pastoralists had to negotiate safe pastures with the leaders of Ida-Maraš (cf. 5.2.1.2). Incidentally, there is some uncertainty whether the Sutu were of Amorrite stock like the other tribes discussed here or part of a different Semitic branch, and they have in fact been suggested as being of Aramaean stock (cf. 3.2.6). Albeit intriguing, this is somewhat outside the main focus of this dissertation and would have to be adressed by another study,

The tribal name *Sutu* is often translated in Akkadian as “the South” or “southerners” (Durand 2010, p. 261), which led Streck (2002, p. 165) to suggest it referred to their geographical locations when seen from the Yamina/Sim’al point of view – areas of sedentary settlements and summer habitations on lower Euphrates and possibly the plateau oases west of the river (cf. Heimpel 2003, p. 27), and their winter pasture territory in the Palmyrene, i.e. south of the Euphrates. However, demonstrable evidence for sedentary habitation in the form of towns or villages is still lacking and such settlements are often presumed. Luke (1965, pp. 121-123) proposed this hypothesis early on, but his arguments are still supportable today (cf. Streck 2002, pp. 164-165, 170). When e.g. Rim-Sin of Larsa defeated a coalition of enemies, they were listed as “Uruk, Isin, Babylon, Sutium, and Rapiqum”, from south to north as was the custom, thus positioning Sutean lands more or less in the area around Sippar (Luke 1965, p. 122; Streck 2002, p. 165 – cf. **Figure 5.12**, no. 12, also cf. **Figure 3.6** for the other toponyms in this list). Durand (2009, p. 506) mentioned that in fact one text provides the name of a “distant Sutean” settlement, called Eš or Yaš, suggesting that Sutean actually was a West Semitic language as well as the tribe also inhabiting *alum* like the other Near Eastern tribes. Another town may have been Udanum near Larsa, shown by this text:

**Text 5.20:** Suteans, about fifty of them, come out of Udanum, three miles (up to) Larsa, and attack the backside [rural areas] of the cultivated zone of the Babylonians and capture three people and carry off grain and return to Udanum (cf. Heimpel 2003, p. 467, **27 161** – my clarifications in brackets).

Their presence near Sippar is finally suggested by recurring attacks they carried out on towns and settlements in Suhum, like Yabliya and Harbe (**Figure 5.12**, no. 11), attested by both texts from Mari and Sippar (cf. Durand 2009, p. 506; Heimpel 2003, p. 26). The presence of cattle herds among Suteans in the lower river valley is also indicative of sedentary components in villages alongside their mobile pastoralists (Durand 2010, p. 261, note 30; Streck 2002, p. 172).

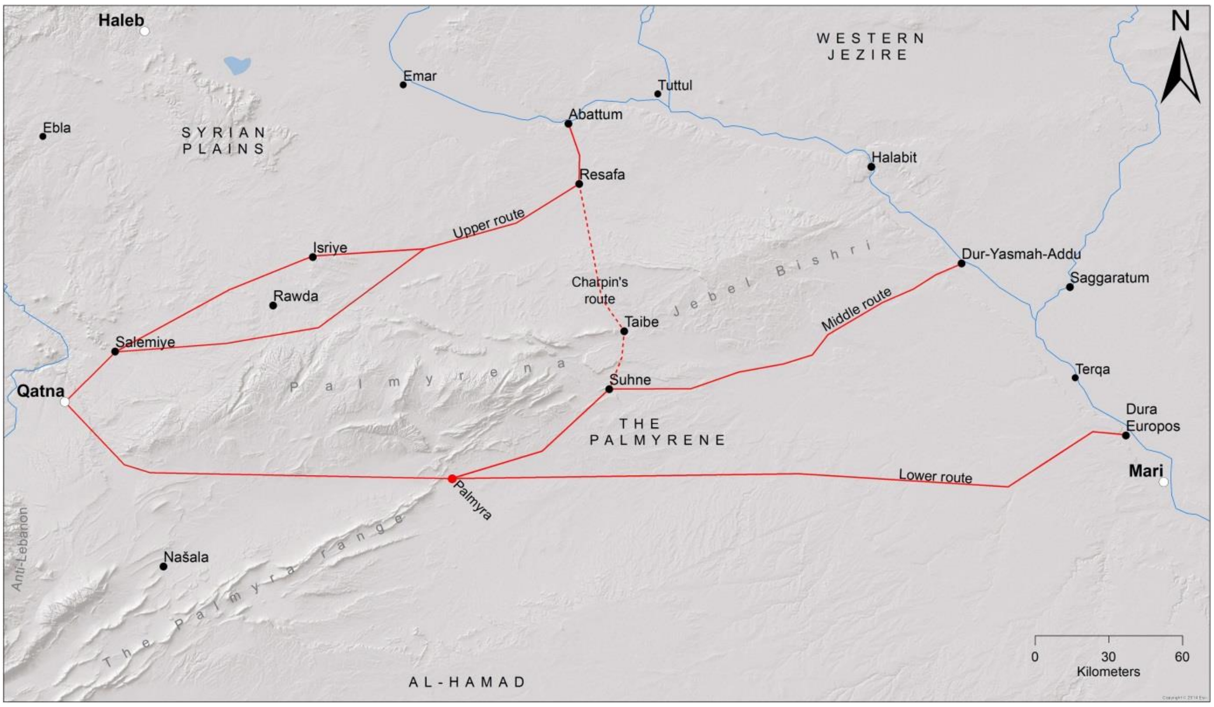



**Figure 5.14:** The three routes Šamši-Addu advised his son, Yasmah-Addu, to consider for marching an army across the Palmyrene. It has been shown that the starting points for the lower, middle, and upper alternatives were approximately Mari, Dur-Yasmah-Addu, and Abattum, respectively. The routes themselves have not been fixed, with particularly the specific path of upper route – the one which in fact seems to have been chosen – being uncertain. Charpin (2004) suggested it went via Taibe and Suhne to Palmyra, but in my view treks along the northern parts of the Palmyrene seem more likely. They are c. 100 km shorter than the Taibe-Suhne alternative, and potentially crossed the Uprapean *nighum* indicated in the text (cf. text **3.4** and **3.5**), rather than the Sutean one which probably lay further south and east.

There are more textual references to Sutean pastures. As repeatedly alluded to in this dissertation, it is generally accepted that their territory encompassed at least large parts of Jebel Bishri (e.g. Charpin 2010, p. 243; Prag 1985, p. 87, fig. 2), and in my view probably also central Palmyrene and the plateaus along the Euphrates banks, although Joannès (1997, p. 409) believed Jebel Bishri constituted their ultimate northwestern limits of pasturing. However, as Suteans are attested to water their flocks and cross the Euphrates between Dur-Yahdun-Lim (same *alum* as Dur-Yasmah-Addu) and Halabit, as well as near Terqa (Durand 2009, p. 510; 2010, p. 261 – cf. **Figure 5.14**), they probably pastured their ovicaprines on both plateaus along the river on their migration from their summer habitations and *alum* in Akkad and Sumer as well. Again, Luke (1965, pp. 123-124, 128) was early in suggesting these steppe areas as their winter pastures, providing the Sutean *hibrum* with unsurpassed knowledge of routes, wells, and dangers in the region – and generating income for the Mari palace through transit taxation, *miksum* (cf. **Table 5.1**), as they migrated through its heartlands and *halsum*. Variations in tribal allocation of pastural ranges within the Sutu tribe are not yet known, although it seems at least the Mihalizayu clan did frequent Jebel Bishri (cf. Pappi 2006, p. 247). The fact that different Sutean leaders were contacted to guide travellers along different routes (cf. Joannès 1997, p. 410), as well as the MBA Mari concept of "distant Suteans", do suggest a system of separate *nighum* based on clans and various areas of geographical expertise. According to Streck (2002, p. 165), the southernmost limit for their winter pasture must have been Al-Hamad, as this climatically and ecologically would have been too arid for ovicaprine pastoralism. In northern parts of the Palmyrene ranges they would also have had to compete or come to terms with Yaminite Uprapean *hibrum*, as this was seemingly the southern part of their *nighum* (cf. **Figure 5.12**). In this instance, I would argue that conflict sometimes occurred, and this is the context in which we should interpret the hostile interactions occurring involving Suteans – tribal competition manifested through raiding.

**Text 5.21:** (…) (Mobile Yaminites) who went to raid Sutean sheep, (…), raided Sutean sheep at the "Cold well" and Qabaqab. (…) downstream of Mount Bahalta-Gurâtim, they went down to the Euphrates. They [the Suteans] had not yet sheared the sheep. (…) They [the Yaminites] looted the sheep like wolves, quick to steal and leave. This is Ihîl-pi-El, son of Ginnum the Uprapean, the leader of the expedition, lighter of the fire. They took approximately ten thousand sheep. The Suteans came in pursuit to the rescue, but (…) (Durand 2010, p. 261, note 30 – my translation from French and my clarifications in brackets).

Text **5.21** suggests two very interesting points. Firstly, that the Suteans returned from Jebel Bishri or Palmyrene to the Euphrates valley at the point of the year when their sheep were supposed to be sheared (although they had not *yet* sheared them), i.e. late April to mid-May (cf. 5.1.3.2 and **Figure 5.5**) – clear evidence for their migration back in late Spring and their presence in the Syrian steppe in the winter months. Secondly, that their Yaminite adversaries in this instance were the Uprapeans, supporting the hypothesis that they were regularly in competition, which presumably was due to bordering territories, as suggested in **Figure 5.12**. Following the same line of argumentation, it is possible that the same aspects were in play during the events described by text **5.12**, either due to Uprapean mobile pastoralists at that time pasturing in the area east of Qatna – possibly the southwesternmost limits of their *nighum* – or that Qatna itself was affiliated with the Yamina tribal confederacy, and possibly with Uprapum. The attack on Palmyra and Našala may have had a similar *raison d'être*, particularly as it happened as part of the same line of events. Both events, as well as the retaliatory occurrence in text **5.21**, while not necessarily directly connected, were part of traditional practice associated with mobile pastoralism in a tribal setting (5.1.3.4 and 5.2.1.4), mainly carried out during the winter season when the whole *nawum* were moving about in their *nighum* – the latter of which regarding the Suteans were in my view constituted by central regions of the Palmyrene and the Jebel Bishri in the MBA, as well as probably further south along the Euphrates. However, notions along the lines that the Sutu were "more nomadic" than other tribes (e.g. Anbar 1991, p. 174) or perpetually hostile (e.g. Durand 2004, p. 196), are outdated and should be put to rest (cf. 5.2.1.3). They seem to have been part of the same tribal, political, social, and demographic structure as the other tribal groups found across the Near East during the later EBA and the MBA.

With this perspective at the outset, I will finally turn to the exercise of integrating Near Eastern tribal concepts and mobile pastoralism with archaeological material, and attempt to combine these into a model for interpreting the distribution of funerary structures found in the Palmyrene and extended Syrian steppe.

## 5.4 Tumuli, tribal ancestors, and territories

Clearly, tribal territories and the cycle of seasonal migration are integrated on a number of levels for mobile groups in both recent and ancient past in the Near East. I have mainly kept this aspect separate from the many structures found in these areas and their significance in a tribal context. However, I will in this final subchapter turn to data and analyses which suggest tumuli (cf. 4.5.3) and perhaps other archaeological structures (cf. 4.5.4 and 4.5.5) in fact may have formed an important part of the concept of tribal territories. Key to this notion is ancestor worship and reverence for their perceived power as mediators in the interplay between divine and human existence (e.g. Porter 2012, pp. 217-218).

### 5.4.1 Ancient and recent mortuary traditions

There is evidence from ethnographic studies that mobile groups frequently pay respect to known shrines or graves, although in an Islamic Near Eastern context this can probably not be likened to the practice presumed for tribes practicing mobile strategies in the EBA and MBA. Still, it is interesting to note the importance among recent mobile groups of visiting monuments erected in remembrance of past family members as part of a pastoral migratory cycle. One example mentioned by Bradbury (2011, p. 174) described how a Qashqai father erected an inscribed grave stone in memory of his deceased son in the pasture territory of his tribe, to which the dead boy's parents paid a visit every spring and autumn during their mobile season. Barth (1961, pp. 137-138) observed how the Basseri in southwestern Iran conceptualised time according to the annual migratory cycle, and during their movements passed by waypoints to which they had a connection *en route*. One example of this could be shrines of holy men, that were shown due respect, even without any associated names or myths. Although not directly comparable to ancestral tumuli, it is easy to envisage a similar practice in a context of seasonal migrations. This analogy could have been our only source of information on mobile pastoralist rituals linked to burial monuments, but luckily once more the Mari archives provide a more or less direct source on such practices in the MBA. Additionally, certain practices known from Ebla during the EBA could also be seen in a context of landscape, mobility, and territory.

From studies of the Ebla archives (cf. 3.2.3) it has in later years become clear that the Eblaite state incorporated a regular ritual, performed twice a year, where local rulers up to 300 years past were worshipped as ancestors. This may not seem to have an immediate analogy to seasonally migrating groups, but some details are intriguing. There were rituals for specific ancestor kings – although never immediate predecessors to the current one – performed at specific days of the month at the actual or perceived burial places for these ancestors, which included movements from the urban area to named sites in the rural parts of the polity. Such ceremonial "tours" could include festivals and funerary rituals such as offerings at important ancestral sites, and frequently and repeatedly took place away from the city itself to mark out and lay claim to the territory of Ebla (Archi 2012, pp. 6-14; also cf. Porter 2002, p. 5; 2012, pp. 214-215). In some ways, although replacing the Eblaite institution of the king with the tribal group, a parallel practice may have been important for structuring and cementing territorial claims of various mobile groups every year as part of the migratory cycle. This forms a central part of my interpretation concerning the myriad of Palmyrene burial monuments. It is supported by the *kispum* rituals practiced at Mari during the MBA, which instead of focusing on royal lineages like in EBA Ebla, rather revered the collective aspect of ancestors through communal feasting for the living and the dead members of the tribal group, thus purveying and affirming the shared ideal of tribal unity. Ancestor worship and ancestor-related practices could in this way constitute the apex of real or fictive lineages through which all members of a tribe or clan could conceive themselves as *connected* – clearly important in a context of fluid and flexible tribal structures (Porter 2002, pp. 1, 5). I have discussed above (5.2.1 and e.g. text **5.18**) how kinship in fact could be *created* among tribal societies for various reasons, and the dead could likewise be incorporated through assumption of responsibility for funerary and post-funerary mortuary traditions (Porter 2012, p. 42). However, while dead ancestors were receiving offerings, they were usually not worshipped as deities, but rather seen as acting intermediaries or liminalities between people, gods, and ghosts (Porter 2007/8, p. 202). The locus for such rituals, the place of highest potency and nexus between the planes of existence, was the tumulus – argued by Hodder (1994, p. 80) to often represent the house of the ancestors – where such entities were not seen as gone, but in fact present, at least symbolically, and maybe active and possible to invoke for a cause (Porter 2007/8, p. 201; 2009, p. 208). The exact nature of ancient rituals is difficult to know in detail, but ancestors may have been remembered as strong personalities, just leaders, or warriors of great and valorous feats commemorated as heroes in repeated rituals including offerings, libations, and communal feasting with story-telling (Helwing 2012, p. 55). For mobile groups, such ceremonies could have taken place within a context of seasonal migration, or even constituted integral parts of the migratory schedule, where locations in the landscape was associated with various ancestors, closer family members, or deities. Porter argued:

*"Ancestor traditions as a complex dynamic of ideological representations of the social group in relation to place expressed in the physical containment of ancestors in a particular type of mortuary structure – monumental and visible burial mounds"* (Porter 2002, p. 1).

It is necessary to realise that these various manifestations and dimensions of being in the cosmology and minds of the ancients were probably both integrated and unseparable existences, and many divine and earthly notions came together in the tumulus through interment of dead individuals and their subsequent inclusion in commemorative and seasonal rituals (Porter 2007/8, p. 201). Of course, such perspectives also provided the dead with a perceived power of agency, for themselves or on behalf of the living, and likewise potential for participation (Helwing 2012, p. 48). While these aspects initially may seem rather hypothetical regarding the EBA-MBA societies of the Near East focused upon in this dissertation, the Mari archives have provided a link connecting ancestor worship and MBA perceptions of the spiritual world specifically with the construction of tumuli or stone cairns. The best attested of these is the concept and structure called *humusum* (cf. Durand 2005).

### 5.4.2 The humusum and similar monuments

Strictly speaking, the Amorrite term *humusum* did not necessarily refer to a funerary monument (see below), although the physical structure seems to have manifested itself as a cairn of rocks and possibly wood or a pile of boulders – essentially similar types of constructions when seen and surveyed in the field by archaeologists four thousand years later. Its main purpose for the ancient populations in question was both mentally and physically as a monument of commemoration, a memorial landmark integrated into and being part of the regional landscape. The importance of these structures playing such a role has been argued to constitute a trait of continuity from the EBA to the MBA, even though the term *humusum* is primarily known from the Mari archives (Durand 2005, p. 110; Felli 2012, p. 98). Although these cairns were seemingly imbued with spiritual power and carried inherent sanctity, they also served a mundane purpose as reference points in both a physical and narrative sense, as these two text extracts show:

**Text 5.22:** Tell my Lord, thus (speaks) Hammi-Ishtamar thy servant. Mut-Panasi, whom the *hana* met at the funeral monument (*humusum*) of La'um, which is downstream of Halabit [modern Halabiye, cf. **Figure 5.14**]. (...) (Durand 2005, p. 101 – my translation from French and my clarification in brackets).

**Text 5.23:** Tell my Lord, thus (speaks) Yaqqim-Addu, thy servant. On the day I sent this tablet to my Lord, Kusan, messenger of Karkemiš, Šamaš-Redi, and a friend of his, my Lord's (people), who were travelling to my Lord from Karkemiš, were attacked by four Uprapeans at the funeral monument (*humusum*) of Ayalum, who killed Šamaš-Redi and his friend (...) (Charpin 2010, p. 244; also cf. Durand 2005, p. 96).

Both these events mention the *humusum* of well-known dead individuals, so the king receiving the messages – in this context Zimri-Lim of Mari – would know where the incidents happened (cf. Charpin 2010, p. 244). These figures are known to us as kings of Yamina tribes who rebelled against Yahdun-Lim during the initial years of the 18$^{th}$ century BCE, but were captured and subsequently executed, and their Yaminite forces defeated (cf. 3.4.2.2 and text **5.19**). However, the *humusum* was a structure that could be erected for several reasons. For instance, the *humusum* commemorating these Yamina leaders could have been actual burial cairns or representative cenotaphs (Durand 2005, pp. 102-103). Another motivation known from textual sources to have constituted a *raison d'être* for the construction of a *humusum* is the commemoration of political agreements between mobile groups (cf. Durand 2005, pp. 115, 125-126). The nature of these agreements is attested to have varied from e.g. the resolution of a dispute surrounding migration rights through tribal *nighum* or territories, to symbolizing a return to peaceful relations following a period of conflict, and could probably also have been associated with a number of other arrangements. Finally, *humusum* are attested to have been erected by authorities and linked to specific deities, for instance like the one called "El's blessing" located downstream of Terqa, probably used in state cults and under royal responsibility (Durand 2005, p. 135).

**Text 5.24:** The *humusum* which is downstream of Hišamta [near Terqa], [called] El's blessing, belonging to the Lord, restore it anew, and then, in this very spot, place your *ramum* [see below and cf. text **5.25**] (Durand 2005, p. 137 – my translation from French and my clarifications in brackets).

Evidently, these structure were subject to deterioration from the prevailing elements of the steppe environment and could require regular attendance for their upkeep. The *humusum* also seemed to carry an inherent sanctity, with transgressions being perceived as serious offenses against the deceased or ancestor it housed or represented (Durand 2005, p. 109), as well as any groups who related to or had affiliations with it, shown by this letter by the Rabbean leader, Dadi-Hadun:

**Text 5.25:** About the *humusum* of which I have talked to you – it is a funeral monument (*ramum*). It has been five years since this *humusum* was erected, and I have passed by ten times from upstream or from downstream since then. Never did I touch this *humusum*. During my present journey, when I left for you, I had reached Muban [in the area of modern Deir ez-Zor, cf. Heimpel 2003, p. 618] when I was told: "The *humusum* of Ayalum has been destroyed." I did not want to believe it until I sent two servants and they saw this *humusum*. Then I grew very angry and held my hand over [i.e. some form of retaliatory action] the *humusum* of Lahun-Dagan. They certainly destroyed the one that was erected on a territory that was not their own, whereas I did not destroy the one that was erected on my territory (…) (cf. Durand 2005, pp. 97, 99; Charpin 2010, p. 244 – my clarifications in brackets).

Text **5.25** brings direct light on a number of aspects which are interesting to contextualise and integrate with the tribal world described above (cf. 5.3.2.2). First, it suggests that burial monuments were during the MBA called *ramum*, although this also constituted a conceptual subgroup under the more generalised term *humusum* – both used interchangeably and generally understood by the ancients through the respective context of the structure. It also suggests that the *humusum* mentioned in text **5.23**, was an actual tumulus built for funerary purposes, as both extracts refer to the same monument (cf. Durand 2005, pp. 96, 135). Additionally, it probably means that the *humusum* of La'um in text **5.22** was indeed a *ramum*, and that the last Yaminite leader captured by Yahdun-Lim during that same rebellion, Bahlu-Kullim – king of Tuttul and the Amnanum tribe (cf. text **5.19**) – also lay buried under a *humusum* erected by his kin and tribesmen. As there evidently were aspects of territory and tribal zones of control associated with these structures (cf. Durand 2005, pp. 103-105; Bonacossi & Iamoni 2012, pp. 244-245), this latter one was probably located near Tuttul, the central *alum* of the Amnanum and Bahlu-Kullim, just as the burial monument of Ayalum probably had been erected near Abattum (cf. **Figure 5.12**, nos. 2 and 3). This would also fit well with the itinerary of the Karkemiš messengers in text **5.23**. The *humusum* of La'um on the other hand lay downstream of modern Halabiye[28], in northern Ah Purattim, where the central *alum* of the Uprapeans, Samanum, was found – all conforming to the pattern of tribal *matum* (cf. 5.2.1.3) . However, the monument of the Uprapean leader Lahun-Dagan had been permitted to be constructed on the territory of the Rabbum tribe, i.e. in the Abattum area (**Figure 5.12**, no. 2), presumably because the death had occurred during the seasonal migration *en route* to or from the Uprapean *nighum* in that region (Durand 2005, pp. 97, 99; Charpin 2010, p. 245 – cf. **Figure 5.12**). Thus, to erect a burial monument, it may seem that one had to have the territorial rights through kinship or else permission from the corresponding figure of authority – either the Rabbean leader (as inferred from text **5.25**) or the king of Mari (as in text **5.24**).

Finally, the textual sources suggest that there were a number of such cairn-like monuments found throughout the rural Near Eastern landscape during the MBA and presumably also the EBA, the designations of which could have been synonymous with the broader term *humusum*, or denoted a similar structure, but erected for a more specific function or motivational context (cf. Durand 2005, pp. 139, 173; Marti 2005, pp. 191, 200). *Narum* seems to have been more or less an Akkadian equivalence to the Amorrite term *humusum*, *sikkanum* denoted a cairn strictly for worship, while *birutum* was a mound erected in a military context, with the etymology of the latter suggesting that is was a *thing which was to be seen* – probably one of the most important features of these cairn-like structures. This function is indeed still is partly in effect (cf. 4.1.3, 4.1.4, and 4.2.3), and would probably have been much more manifest in the Bronze Age landscapes without the four millennia of deterioration they have suffered from human agency and harsh weather.

[28] Incidentally, on the western plateau overlooking the widening of the Euphrates valley south of Halabiye – i.e. where the river exits the narrow canyon (*al-khanuqa*) – is an area of dense concentrations of tumuli, clearly visible on the corresponding Google Earth imagery, but not reproduced in this dissertation.

### 5.4.3 Palmyrene tumuli and their ancient contexts

Tumuli as burial monuments can be said to both denote space through their visibility and mark the continuity of a group over time in relation to a landscape or place, an effect which is not possible to achieve with below-ground burials – they manifest to whom an area belongs and, by representing a genealogical link, why it belongs to them (Porter 2002, p. 25). Monumental burials could be turned into commemorative sites through rituals. Ancestors that were housed within the tombs were probably not perceived as memories, but rather existed as powerful beings beyond the human realm, able to act beneficently or malignantly through invocation on behalf of those maintaining the proper rituals and tending their resting place (Porter 2012, pp. 192, 230). Texts from Emar dating to the mid-2$^{nd}$ millennium BCE show how ancestors were named, honoured, and invoked, but not worshipped as deities. Additionally, they were not only active as agents when invoked, but could also passively watch over rights, obligations, and resources in the form of communal and individual property (Porter 2002, pp. 2-3). This is in my view the primary function of the vast fields of tumuli found in the Palmyrene. Above-ground monuments mark territorial and ancestral claims to lands and resources used in specific parts of the year – essential to mobile pastoralist groups for their subsistence and lifestyle. In fact, farview tumuli (cf. 4.1.4) as archaeological structures have been argued to be particularly symptomatic of territorial claims in antiquity. Fear of the wrath of the dead could operate as a mechanism for defining territorial and social boundaries and inhibiting transgressions, a privilege upheld through the obligation of mortuary rituals (Porter 2009, p. 208; Helwing 2012, p. 55 – also cf. Porter 2002, pp. 1, 3). Helwing pointed out that

*“Visibility of monuments and installations for continuous performance of rituals both serve for reiterative construction of mental memorial map where the places of the ancestors are firmly anchored”* (Helwing 2012, p. 55).

Seen in light of the Palmyrene archaeology, both these notions can be argued to have been in play – tumulus monuments of various sizes, albeit generally within a relatively narrow structural horizon, visible from many perspectives and clearly meant to be seen by groups traversing the region, as well as auxiliary features associated with many of them (cf. 4.1.4 and e.g. **Figure 4.2**, **Figure 4.6**, and **Figure 4.24**). In addition, certain buried funerary features, documented to form part of tumuli by both the Syro-Japanese and the Syro-Italian archaeological projects (cf. 4.7.3 and 4.7.4), also seem likely to have existed in association with other tumuli recorded by the Palmyrena project. Finally, the conceptual integration of burial monuments, ancestors, and landscape would – as argued by Helwing (see above) – form a mental memorial map reiterated annually as part of the mobile season. Just like Porter (e.g. 2007/8, p. 208) argued to be the case at Tell Banat, tombs were probably the focus of on-going rituals over a long period, even without any subsequent interments. However, as has been shown tentatively by radiometric and relative dating (cf. 4.6.1 and 4.7), the later EBA and the MBA seem to have been the main periods of construction for such monuments. Helwing (2012, pp. 53-54) interpreted a number of new patterns in Near Eastern mortuary features from EBA IV compared to earlier parts of the 3rd millennium, most notably of which were summarised as:

- Certain credibility in attributing them to mobile groups.
- Trend toward multiple burials, possibly due to increased awareness of group belonging such as kin-groups based on descent.
- Focus on visibility and accessibility, suggesting continuous and frequent use for mortuary rituals in association with ancestor veneration.
- Spatial continuity for manifestation of territorial claims to specific landscapes or localities by respective groups using these spaces for burials – demonstration of ownership through filiation.

All these are aspects which are relevant and regularly associated with the tumuli and structural complexes recorded by the ground surveys of the Palmyrene (cf. 4.1.4 and 4.2.3).

**Figure 5.15:** Two examples of tumuli associated with refurbishments which could be associated with mortuary rituals of unknown nature (also cf. **Figure 4.6**). Left: Cluster of tumuli (appendix 1, nos. 229-235) which also incorporated several other structural features into its complex, among them this rectangular enclosure or platform

with some form of standing stone or stone construction along one side (photo augmented with clarifying lines by myself). Right: Tumulus in the lowest foothills of Jebel Merah (appendix 1, no. 236) which is surrounded by a complex pattern of stone-lined rows.

Durand (2005, p. 127) has argued that the memorial cairn as a fundamental reality in the Near East has previously been archaeologically frowned upon, possibly due to its lower visibility compared with stelae or embossed rocks. Taking a wider view, other parts of the Near East has seen a longer history of research into arid landscape structures and tumuli, particularly the southern part of the Levant, including Sinai, Jordan, and the Negev Desert. Haiman (1992) summarised evidence from the Negev highlands, where two different categories of cairn fields had been recorded through surveys in the period 1979-1989, some of which also had been excavated. Some of the 800 examples documented were associated with settlements and dated to the Levantine EBA and the MB I – i.e. more or less EBA and MBA I when synchronised with Syrian periodisation (cf. 3.1.2). However, by far the majority of them were described as cairn fields at high altitudes, visible from far away (cf. Haiman 1992, pp. 25-27). There are a number of characterisations and details regarding these latter archaeological complexes from the Negev which are interesting when seen in relation to circumstances in the Palmyrene. They are documented to be quite one-dimensional in form, mostly constructed as a ring of upright stones with the insides filled with rocks, of c. 0.5-1.0 m in height and 3-9 m in diameter, and often contain a modest-sized burial cist (Haiman 1992, pp. 30-31), a description which could fit some of the Palmyrene turrets and larger cairns/monumentals (cf. 4.1.3). Initially dated to the MB I by association with nearby settlement sites, a reevaluation supported by recent evidence led Haiman to place the Negev cairn field phenomenon firmly in the EBA. The same was argued to be the case with similar structures in the Sinai, which previously had been dated to the Chalcolithic, although further precision was not possible to obtain. An intruiging aspect was the lack of human remains in these cairns, with only 7.5 % seemingly being used for burials, indicating a more ritual element to these complexes rather than just a funerary purpose (Haiman 1992, pp. 33, 37). Supporting this interpretation was the frequent presence of auxilliary structures proposed as ritual installations, like elongated walls of parallel stone rows or platforms, both filled with dust and small stones. These latter structures were often located on hilltops, had been constructed with frame of larger, occasionally hewn, stones, were too shallow to have contained a grave, and could be dated to the MB I – possibly representing a structural continuation from the wall structures, which were placed in the EBA (Haiman 1992, pp. 31, 38-39). These descriptions could very well have referred to many of the refurbishments associated with tumuli and tumulus clusters in the Palmyrene (cf. 4.1.4, **Figure 4.6**, and **Figure 5.15**). Finally, it was pointed out that such cairn fields seemed to date to the EBA or later 3$^{rd}$ millennium BCE in other parts of the Near East, including other parts of Israel, the Lebanon Valley, and Jordan (Haiman 1992, p. 42). As discussed in 4.7, as a result of the 20 years that have passed since this reevaluation of the Negev cairn fields, the Palmyrene and other parts of the Syrian dry steppe can to some degree now be added to this corpus.

**Figure 5.16:** Tumulus (appendix 1, no. 165), here marked by Dr. Nils Anfinset, situated right next to the path crossing a significant low point in the northern wall of Jebel Abyad into Wadi Mazrur going toward Jazal. Although not visible from far away, it is clearly positioned to be noticed by anyone travelling along this route, which is the northern end of no. 16 (eastern arm) shown in **Figure 4.27**.

Taking into account the analyses of Helwing (2012), the earlier work by Haiman (1992), and the information gleamed from the Mari archives (cf. 5.4.2), certain conclusions could be presented with regard to the Palmyrene tumuli. Their association with mobile groups seems likely, both implied by the environment and suggested by excavations carried out on essentially the same types of structures in other parts of the region, as well as the known presence of such groups there during the MBA. Group awareness and multiple burials is indicated by the tendency of tumulus clustering, often around a central cairn (e.g. cf. **Figure**

**4.49**), both according to the more strict definition of complexes used in this study (cf. 4.1.4) or even more so if following the definition of cairn fields employed by the Syro-Japanese project. Kinship or group affiliation associated with cairn-like structures as markers of burials or otherwise is also clearly attested in ancient texts, manifested in the physical structure known as *humusum*, which incorporated a number of subcategories, e.g. *ramum*.

Visibility and accessibility can in general be argued to constitute the most striking characteristics for Palmyrene tumuli, although this depends on the perspective. Not all of them can be seen from kilometres away, but those that are more unassuming are still found in close relation to local routes or topographical features associated with important communication lines (e.g. **Figure 5.16** – also cf. **Figure 4.9**, **Figure 4.16**, or **Figure 4.26**). They were also acting as markers in the ancient landscapes, and could be used as geographical reference points. Several complexes have been shown to incorporate other types of structures, not classifiable as burial monuments, such as a number of platforms, stone rows, wall-lines connecting tumuli, foot chains, stone circles or half-circles, and smaller stone rings (**Figure 5.15** and cf. **Figure 4.6**). These may have had a role in mortuary rituals, although this must be considered speculation. However, there are indications of such practice both in the archives of Ebla and Mari, where ancestor veneration within a structure of kinship and filiation is attested, and could probably be extended beyond the Eblaite elite to also be employed by other groups. Finally, the satellite imagery survey of the region has documented a vast and continuous distribution of tumuli across the region, although not undifferentiated, with some landscapes clearly being more central in this respect than others (cf. **Figure 4.30**), supporting the suggestion that demarcation of territory is an essential aspect of this physical expression, presumably based on the belief among both filiated and non-affiliated people that ancestors as agents of power and intermediaries between human societies and the spiritual world could act as guardians of ancestral claims to e.g. territories of pasture. All in all, the change in funerary patterns from early 3$^{rd}$ millennium BCE to the later part and the topographical and social contexts discussed above seem to be reflected in the archaeological assemblages found in the Palmyrene.

## 5.5 Summary and conclusions

A central part of the original hypothesis for this dissertation (cf. 1.2.1) was that mobile pastoralists were responsible for many of the structures recorded across the Palmyrene. This chapter has dealt with all manners of issues associated with such groups in the Near East, both in recent times and during the late 3rd and early 2nd millennium BCE, in order to produce a coherent picture of their role in ancient societies, their relationships with other groups, the specific nature of their lifestyle, and their connection with archaeological remains. Initially, I presented earlier views on mobile pastoralists and how they have been dealt with in archaeological research until recently (cf. 5.1.1). Particularly their conflation with recent Bedouin populations has provided basis for many misconceptions. In addition, I have discussed various concepts regarding mobility, pastoralism, and tribal organisation among recent populations to present various scholarly views on such matters and clarify my own position (cf. 5.1.2). Thereafter, I focused on mobile ovicaprine pastoralism as a Near Eastern subsistence, and showed how the seasons are key to understanding the relationship of mobile pastoralists with the land and other groups. Traditionally they schedule their year with the steppe being accessed for pasturage every year starting with the onset of winter rains and ending as the dry season approaches, at which time they retreat to secure water sources on the plains and in the river valleys. Their seasonal migration takes place within a structure of territories allocated by tradition and custom, which are communally accessible through membership of tribes. During these movements many mobile groups also practice multi-resource procurement strategies as opportunities arise. One of the most important aspects to realise is the fact that a tribe generally consists of both a mobile and a sedentary component, which often are bound by kinship, share a bifurcated territory of cultivated areas and pasture ranges, and act together when facing adversaries (cf. 5.1.3).

The Mari archives can attest to very similar practices in MBA societies (cf. 5.2). Mobile pastoralists as ovicaprine herders accessed the dry steppe with their flocks for winter grazing, but were also part of a tribal structure in which a sedentary component stayed behind in the tribal territory of cultivated land, villages, or towns. The mobile groups were known as *hana* or *hibrum,* terms probably reflected during the 3rd millennium BCE in the *kammu* of the Ebla archives and the better-known *mardu* – i.e. the Amorrites. While the latter designation could carry a number of meanings depending on the perspective, recent research has convincingly shown that in many contexts *mardu* were referring to people of mobile pastoralist lifestyles, who represented a cultural identity which seems to have been adopted across the region in the MBA (cf. 5.3.1). Near Eastern tribes during the MBA seem to have shared a number of structural and social traits. Each was associated with a tribal capital and a settled region, while their mobile component had pasture territories, *nighum*, which were defined and justified by tradition and found in various parts of the Near East (cf. **Figure 5.12**). They seem to have shared bonds of kinship and most had an idea of common ancestry stretching back to the EBA. Much of the Palmyrene and Jebel Bishri seems to have been the pasture territory of the Sutean tribe (cf. 5.3.3), although its northern lowlands were possibly also partly the Uprapean *nighum* of the Yamina confederacy, which occasionally led to conflict and raiding between these two groups. Finally, I tried in this chapter to integrate the Palmyrene tumuli with certain ancient concepts and practices, specifically the manner in which territory is attested to have been demarcated and maintained by moving through the landscapes as part of a ritual tradition (cf. 5.4.1) and the concept of *humusum* – a cairn structure constructed for a variety of purposes, including as actual burial monuments (*ramum*), cenotaphs, or as markers relating to deities or the commemoration of an agreement (cf. 5.4.2). These are clearly attested in the Mari archives as manifestations of tribal authority and incorporated a functional aspect related to the demarcation of territory. All in all, the evidence seems to support an association between EBA and MBA mobile pastoralist practices and many of the archaeological structures recorded in the Palmyrene. I will now finally turn to a summary and integration of all the aspects dealt with throughout this dissertation in order to produce a coherent synthesis.

# 6 Palmyrena and mobile pastoralists in the EBA IV and MBA

The research for this dissertation was sparked by questions emerging as a result of the Palmyrena project survey and focused on exploring three of these in detail. The first one concerned climate and environment and aimed to shed light on any climatic developments experienced by the region and its populations during the EBA and MBA, as well as reconstructing a picture of the dry steppe biomes themselves prior to their obvious and recent ruin. The second question concerned the archaeological remains in the Palmyrene, which were seemingly ubiquitous and followed certain distributional patterns, although the reasons and functions associated with them were hypothesised and would require further investigation. In addition, chronological control was relatively lacking for most of the structures, particularly the tumuli, and needed to be unravelled by direct, relative, and comparative dating. The third main question was related to the second. Who constructed all these tumuli? The initial hypothesis that they were the physical manifestation of mobile pastoralists groups in the Bronze Age had its basis in archaeological research from other regions and the environmental context of the region, but had to be studied from a Palmyrene perspective and elaborated through interdisciplinary means. It was deemed appropriate to consider all these topics as a synthesis, to be able to integrate the various themes with each other and produce a more complete picture of Palmyrena.

Climatic data discerned from proxy sources and palaeoenvironmental studies does suggest a general deteriorating trend in conditions throughout the 3rd millennium BCE, but with marked and sometimes rather substantial oscillations between favourable and unfavourable conditions (cf. 2.4, 2.5, and 2.7). The final century of the EBA IV and the time of the Mari archives, that is MBA II, seem to have experienced slightly improved conditions compared to the periods before and after these intervals, which probably means they had slightly higher precipitation levels than the modern regime, although exact numbers are not available. However, a dramatic drop in humidity around 2300-2200 BCE must have had an impact on Near Eastern societies, probably even felt across the lifetime of one or two generations. The effect seems to greater when taking into account the favourable conditions just prior to this incident, which represented one of the best climatic intervals of the entire 3rd millennium BCE. It has been argued convincingly that Near Eastern populations experiencing environmental stress could relieve the pressure through two mechanisms – increased nucleation or increased mobility across the society (cf. 5.1.3.3). Bradbury (2011, p. 479) suggested that sites in the Homs NSA may have been abandoned in the EBA IV by populations following opportunities in the steppes further east, and Wossink (2009, p. 117-118 – also cf. Wossink 2010) argued that socioeconomic developments took place from the mid-EBA and into the MBA which incorporated higher degrees of specialisation characterised by a division into nucleation among cultivating groups and increased mobility among pastoralists. This is supported by abandonment of settlements taking place in the late 3rd millennium (cf. 5.1.3.2). Such a pattern does seem to fit well with a model of tumulus construction mainly centered on the EBA IV and the MBA in the Palmyrene, where territorial claims and group affilliation were the operating mechanisms on a functional level. The Palmyrene could have been affected somewhat by periods of desiccation, e.g. as the Soreq Cave proxy suggests a real decrease in precipitation of 100-150 mm there for the 4.2 ka BP event (cf. 2.5 and 2.7.7), but compared to its current condition, its biomes seem to have comprised much more robust ecologies in both vegetation and fauna. In addition, the climate went from *wetter* than today toward conditions similar to the one experienced by the Near East in recent times, including shorter intervals of moister climate. However, perceptions are relative, and as the new climatic regime also may have incorporated an element of irregularity in rainfall, systemic uncertainty among mobile pastoralist groups depending on the region for pasturage could have constituted a larger part of the EBA IV and MBA worldview, than e.g. during favourable times in the mid-3rd millennium BCE. On the other hand, the modern ecologies of central Syria suffered significantly from the introduction of motorised transportation, which during the previous century provided increased access to remote regions. This is quite clearly indicated by environmental studies and the large discrepancies in landscape descriptions from early 20th century CE until the present time. Even during the 1930s, this effect was noted by Schlumberger (1951, p. 4), who described Jebel Abyad as *recently* denuded of trees, although he also noted that Jebel Shaar and Jebel Merah still had areas of forest remaining – vegetation which now is *completely* gone. One key factor in this development was evidently overexploitation of tree species, mainly terebinths, which were essential for microclimates and prevented large-scale erosion during the wet season. The process seems to have been exponential and now the deterioration of the steppe ecologies and other parts of the Syrian environment (cf. 2.3) seem to have progressed to far for regeneration to happen. Similarly, up to the late 19th century CE the fauna of Syria was still quite intact, but a combination of the spread of modern guns and a loss of habitat has left many regional populations extinct and crippled several other animal species. Thus, the modern environmental picture of the Palmyrene compared with that of the EBA and the MBA is probably very different.

The central land use of the extensive Palmyrene woodland and dry steppes has for most periods probably been as pasturage, at least under climatic conditions similar to those today, but that does not mean a total absence of cultivation in these biomes. As has been shown by archaeological research in other dry regions, a certain amount of structural investment in the landscape could provide potential for crop agriculture. Rawda or the *kranzhügeln* (cf. 5.2.2) seem to be the large-scale examples of such a strategy, but were established initially during parts of the 3rd millennium BCE associated with advantageous climates, and may have been adversely affected by subsequent deterioration. As I have argued in this study (cf. 4.5.4), some of the stone enclosures found throughout the Palmyrene and in other parts of the Near East, could have been constructed for similar purposes, but as part of a seasonal schedule. Although such structures probably have had a very long period of use beyond the bounds of the Bronze Age, as well as most likely also represent other functions of steppe exploitation, the horticultural aspect is frequently ignored, but should be considered more actively in modern studies – particularly within a context of mobile pastoralism, which in earlier research could get too one-faceted on the subsistence side. Both recent and ancient mobile pastoralists have been shown to incorporate multi-resource procurement strategies when opportunities beckoned, and small-scale cultivation was one of these. Another strategy was hunting, which is represented by the other main structure type in the archaeological assemblage of the Palmyrene – the kites (cf. 4.5.5). The kites are also associated with multi-period usage, and could date from at least the Chalcolithic until the Ottoman period. In certain cases, they seem to be earlier than some of the tumuli, but as structures their function would be more or less intact with minimal care involved. In my view, it seems therefore likely that kites were central implements of the steppe landscapes and also used for hunting by mobile pastoralist groups in the Palmyrene during the EBA and MBA, supported by such dates from other parts of the Near East. The hundreds of kites recorded by Google Earth studies of the region has also provided evidence for a distinct pattern in distribution and shape. The majority of them form large clusters found along the border between the southern Palmyrene dry steppe and the highlands and show a focus on funnelling features in the topography, e.g. the valleys between Suhne and Taibe. The fact that over two-thirds of the kites have entrances oriented toward the southeastern quadrant of the compass, suggests they were meant for animals approaching from Al-Hamad, i.e. very suitable for capturing the large gazelle herds historically known to have migrated annually toward the Syrian plains in the springtime – although now nearly extinct in the Palmyrene. This also means that the best time of the year for mass hunts of this particular animal species would coincide directly with the later part of the steppe season for mobile pastoralist groups, and could therefore form part of a multi-resource subsistence strategy.

Indeed, the annual climatic regime of the Near East has resulted in a strong aspect of seasonality among traditional lifestyles, due to its dualistic nature characterised by hot and dry summers vs. temperate or cold and rainy winters (cf. 2.2.1). Economic exploitation of the landscape has therefore required institutionalised annual schedules, which is evident in studies of recent populations. These generally entered the dry steppe interior with the entire mobile society and their flocks toward the end of the transitional months before the winter rains set in every year. The next six or seven months were then spent on steppe migration, although not in a haphazard or first-to-be-served fashion, but strictly based on territorial access to pasturages from tribal tradition (cf. 5.1.3). All of these concepts seem to be reflected in ancient texts, above all those from the Mari archives. The texts attest to tribal organisations structured in very similar ways as recent Near Eastern groups, with closely affiliated tribes forming alliances at the highest levels and being affiliated with the upper echelons of MBA dynasties, best exemplified by the five tribes of the Yamina confederacy. Each of these had a leader or king (*šarrum*), a centre or tribal capital, and two territorial components – their *matum* and their *nighum*. The *matum* constituted both the settled population itself and their area for year-round habitation, while the *nighum* was their traditionally allocated region of pasturage, where their mobile pastoralist component – the *hana* or *hibrum* – roamed during the winter and spring with their flocks, before returning to summer habitation near secure water sources in the *zor*. For instance, the capital belonging to the Uprapum tribe was the town of Samanum near Terqa, but their *hibrum* probably pastured in the northern lowlands of the Palmyrene and westward to Qatna. Each tribe consisted of various clans, which was made up of numerous households (cf. **Figure 5.7**), and internal bonds of kinship were strong. The same structure seems to have been part of other tribal groups, such as among the Sim'alites, the main adversaries to the Yamina confederation, although their *matum* was constituted by the Euphrates Valley near the Mari heartland, while their collective *nighum* was Ida-Maraš and parts of Jebel Sinjar. This pattern seems to be iterated for all the well-known tribal groups of the Near East during the early 2nd millennium BCE. In this context, it is necessary to mention the Sutu (cf. 5.3.3), which probably had their sedentary component living along the Euphrates somewhere between Suhum and the Persian Gulf during the MBA, perhaps inhabiting parts of the southwestern plateau. However, some of their mobile pastoralists evidently travelled through the Mari heartland toward their *nighum* in Jebel Bishri and the Palmyrene highlands. Like the other tribal groups, they also had their leaders and clans and led similar lifestyles, but as they mainly lived outside the sphere of the Mari administration, the texts do not deal with them in much detail. However, they did pay *miksum* taxes when passing through Mari lands, as well as carrying out raids against their adversaries as part of their seasonal migration – some of which clearly were directed against the Uprapum, with which they presumably also partly shared Palmyrene pastures and who evidently retaliated with their own raids. The Parlmyrene highlands have also traditionally been shared by two large tribes in recent times – the Hadidin and the Mawali – so this practice is not unheard of.

Could this pattern also be retrojected back into the EBA? Matters are not as firmly documented, but the practice and produce associated with pastoralism constituted evidently a large part of the Near Eastern socioeconomic structure. Archaeological evidence indicates an increase in pastoral production from the EBA to the MBA, but also that it was a substantial part of the EBA economy (cf. 5.2.2). This is supported by the archives of Ebla and the bureaucracy of Ur III, both of which attest to pastoralism on a major scale in both state capacity and privately. In addition to food products, ovicaprine flocks provided wool for plucking, sorting, spinning, weaving, and dyeing. The end commodities above all in this – for lack of a better word – industry, were textiles in all shapes and colours, consumed by everyone from the lowliest peasant to the royal courts, and constituting a large part of the trading networks across the Near East, perhaps even in a dominating role. However, the tendency for radiometrically dated central Syrian tumuli to be placed in the EBA IV and chronologically stretching into the MBA (e.g. 4.7.3) should be taken as evidence for a *continuance* of the phenomenon for Palmyrene mobile pastoralist groups, and not two wholly separate culture complexes. Thus, in my view, the variety of *humusum* structures known from the early 2nd millennium BCE texts (cf. 5.4) were probably more or less the same structures as the tumuli constructed in the late 3rd millennium, with similar functional aspects and the same *raison d'être*. Their seemingly late EBA appearance as archaeological monuments could perhaps be attributed to an expansion from all areas of the Near East into the dry steppe landscapes due to climatic deterioration resulting in increased environmental stress – i.e. a need for groups met with increased competition to assert territorial claims or cement real or adopted bonds of kinship to steppe-affiliated ancestors or lineages – but scarcity of evidence make such a conclusion merely tentative.

Mobile pastoralist groups were ubiquitous in the Near East during the EBA IV, although probably under other names than we know from the Mari archives, and steeped in layered meaning to the point of complete confusion for a modern scholar. However, recent research and reinterpretations (e.g. Wossink 2009; Porter 2012) have seemingly been able to peel a few of these away, to reveal a new picture of ancient Near Eastern society (cf. 5.3.1). The Ebla archives probably referred to their own mobile groups by using the term *kammu*, which more or less incorporated many of the concepts attributed to *hana*/*hibrum* during the MBA. In addition, the presence of tribal organisations incorporating both sedentary and mobile components in a manner similar to the tribes of the Mari archives is also indicated by these texts, e.g. the Ibal of the steppe and Ibal of the canal. Then there is the question of the Amorrites, which has haunted Bronze Age research for decades, but should be considered contextually and acknowledged as a layered and relative designation. I have focused mainly on the EBA term *mardu* being associated with mobile pastoralism, sometimes denoting external tribal groups of western origin when seen from a southern Mesopotamian perspective. Examples of such tribes could be the Tidnum (or their alternative designation in the Ebla archives, the Ditanu) or the Yamadium, which from a scribal perspective in the Ur III administration occasionally were deemed hostile, depending on the spatiotemporal context. Finally, the term **kur** *mardu* – the mountain of the Amorrites – did not necessarily refer to a specific toponym, but may instead have designated highlands of pasture, tribal territories used by mobile pastoralists during their seasonal migrations, perhaps more or less synonymous to the concept later called *nighum*. One of these was famously Jebel Bishri, which constituted a tribal *nighum* in the 2$^{nd}$ millennium BCE, and another was Jebel Hamrin. In my view, these realisations – if understood and contextualised properly according to perspectives – paint a much more coherent picture of EBA socioeconomic structures in the Near East, with far fewer paradoxes than in those inherent in earlier models of hostile Amorrites invading the urban civilisations from their inexhaustible homeland in the Syrian steppe.

All these topics lead me to the final unanswered question in the initial hypothesis – the archaeological remains in the Palmyrene dry steppe. The kites and stone enclosures have been dealt with above, but it is the tumuli which must be said to comprise the main archaeological structure type of this dissertation. Porter (2000) argued that the relationship between people and land among pastoralists usually is associated with the practice of demarcated territoriality. Similarly, Barth (1961) showed that access to pastures among recent mobile groups were grounded in tradition and following kinship lines, i.e. communally allocated resource rights based on membership of a tribe or clan. In my view, the tumuli represent the physical manifestations of such rights, marking space through visibility and distribution, and incorporating a temporal aspect by providing real or imagined links to ancestors. In the minds of the ancients, the ancestors were real beings of power, conceptually and supernaturally created or molded from individuals and groups of the past who acquired or upheld these rights. Their protection, benevolence, and watchful eyes could be invoked and maintained through iterations of post-mortuary rituals, in which monuments and complexes were transformed into commemorative sites. These practices may very well have been an important part of the seasonal migratory cycle in the steppe landscapes which housed the tumuli and thereby the tribal ancestors, and in which the pastures lay guarded from trespassers by the presence of these spirits. During the times of the Mari archives, the groups who laid claim to the Palmyrene and Jebel Bishri as tribal territory were as mentioned probably the Suteans and the Yaminite Uprapeans, although the exact limits of their respective *nighum* are uncertain (cf. **Figure 5.12**). Some sort of a northwest-southeast divide between them seems to me the most likely scenario. Whether or not their ancestors had retained such rights during the EBA is pure speculation, but I suggest that the same type of organisational structure was in effect. In any case, the adaptive and malleable nature of identity, kinship, and affiliation among Near Eastern tribal groups of recent and ancient past makes this an academic exercise, because it was the *perceived* association with tumuli as ancestral sites which constituted the main operating mechanism in relation to claims and rights, not necessarily the *actual* ones – although the latter situation could also very well have been in place.

I propose that it is kinship structures like these which are represented in the Palmyrene by tumulus clusters (e.g. cf. **Figure 4.49**), in which tumuli relate to each other in space, and sometimes also by means of physical structures – e.g. connected by stone rows or incorporating secondary interments. Post-mortuary rituals such as ancestor veneration could be represented by auxilliary features as parts of complexes or found in close association with a tumulus, such as platforms, stone rows, and certain other structures. External refurbishments are in fact not unique to the Palmyrena survey, and strikingly similar structures are known from Jebel Bishri to the Negev. Then there is the aspect of tumulus distribution on a microlevel and macrolevel perspective, both of which clearly suggest visibility and access as central functions of these structures. The tumuli (cf. 4.1.4 and 4.2) have been shown again and again to have a connection with communication lines across the Palmyrene – on a farview level, with monumental cairns standing out like silhouettes on the mountain ridges, and on a nearview level, with clusters of mounds and smaller cairns strategically placed on topographical chokepoints with regard to cross-steppe travel. Of course, there is a wide horizon between these two examples, some of which are less obvious when taking their placement into account. The same can be said for the typology defined here (cf. 4.1.3), which does show certain patterns, but not enough to convincingly provide many conclusions – apart from the apparent ubiquitous link to visibility directed toward people traversing the landscape. On a macroscale perspective, there are much clearer patterns, with an obvious focus on the highlands, but a certain degree of lowland spread into major wadi-plains topographically acting as links between regional landscape areas – like the Suhne-Taibe valley (Wadi Sahil, cf. **Figure 4.26**) – or in areas of aggregational or centripetal nature – e.g. the Jazal oasis, which indeed also constitutes a node in the network of Palmyrene communication routes (cf. **Figure 4.27**). In fact, in many ways distribution patterns on a macrolevel perspective can be argued to reflect the ones seen on a microscopic scale. The difference between structural expressions of Palmyrene tumuli – e.g. between monumentals, turrets, and mounds – could be associated with variation in chronology or perhaps even population, e.g. as in two different tribes exploiting more or less the same territory. I am leaning toward a temporal explanation, due to the vast amount of structures and relative variation in form, although certain features seem to be recurring in seemingly different tumuli, for instance dry-stone walls as perimeter boundaries with their interior filled with rocks, both seen in the construction of turrets and larger cairns. Perhaps this is merely a result of structural development, as was suggested for walls and platforms in the Negev? Unfortunately, secure dating of central Syrian tumuli are too few and far between to provide any definitive answers on the typological aspect, but where dates are available it is always the EBA IV and the MBA that emerge, if nothing else indicating that the late 3$^{rd}$ and early 2$^{nd}$ millennium BCE were periods of large-scale tumulus construction. Summarised and conclusively, I would suggest based on the data collected and the arguments presented in this dissertation that the Palmyrene tumuli represent physical remains of mobile pastoralist populations which during the EBA IV and the MBA used the dry steppe landscape as pasture for their ovicaprine flocks on a seasonal basis, but who also could practice multi-resource procurement strategies through large-scale hunting with kites and small-scale horticulture in small enclosed gardens. These groups acted within a Near Eastern social structure of tribal organisation and affiliation, in which territorial demarcation and ancestor traditions played a key part, and the vast distribution of archaeological remains in the Palmyrene may have been a result of economic and social expansion into the arid steppe regions of the Near East due to increased mobility alleviating environmental stress from climatic deterioration.

Further research should undoubtedly focus more on chronological control, which mainly would require excavation of different types of tumuli, and of several tumuli within single complexes to assess the relationships between various associated structures. I still believe that excepting the presence of organic material for $^{14}C$ dating, OSL would be fruitful to employ in order to produce secure dates for all types of Palmyrene archaeological monuments – or indeed arid landscape structures in general. This would clearly require very strict methodology in planning and execution of sampling, but as shown by other studies, it is in fact a viable dating method of Near Eastern archaeological monuments. A particularly advantageous approach would be a combination with other methods of radiometric dating. Unfortunately, OSL dating was not met with success by the Palmyrena project. Of course, all of this is merely theoretical at this point, as the political situation especially in Syria, but also across the Near East in general, is so grave as to prevent any form of on-site archaeological research being carried out in the region in the foreseeable future. Thus, the Palmyrena project probably represented one of the very last attempts of studying Syrian archaeology in the field presumably for years to come. However, satellite imagery studies as a method could provide potential for further research within a number of topics, such as macrolevel distributional investigations of larger archaeological structures as well as certain degrees of detailed studies in form, intra-site relations, and topographical contexts of these remains. While the imagery in Google Earth is limited to the areas they have chosen to cover, other providers – such as Bing – could supplement in other parts. In fact, at the time of writing many areas in the northern Palmyrene seem to be covered by this software, where Google Earth only provides low-resolution images. A combination of the two may be a solution to further expanding the survey of central Syrian structures, unless one can purchase rather expensive, but commercially available products. The method has also enormous potential for other parts of the globe, perhaps in less studied regions, where long-standing volatile situations or very remote and rugged landscapes has hindered macrolevel investigation or archaeological fieldwork – e.g. the Sahara or Somalia – as it has recently been applied to studies of archaeological monuments in Oman (Deadman 2012) and Saudi-Arabia (Kennedy & Bishop 2011). Finally, like the *hana* situation a decade ago, more translations and further analysis of Bronze Age texts by the Mari school and other Assyriologists will undoubtedly increase our understanding of these societies, although the flow of new tablets probably is hampered by a lack of excavations. In any case, I believe the best approach to any archaeological study and the optimal manner in which to achieve significant scientific results is through integrated and interdisciplinary research.

# 7 Reference list

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## 7.2 Web pages

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# 8 Appendices

## 8.1 Appendix 1: Palmyrena project ground survey tumuli

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Features:** | *Blocks* - Surrounding scatter of dressed, rectangular blocks | | | | | | | |
| | *Foot chain* - Complete or parts of foot chain enclosing tumulus | | | | | | | |
| | *Perimeter* - Complete or parts of perimeter foundation consisting of embedded blocks | | | | | | | |
| | *Dry-stone* - Two or more courses of complete or partly built-up block masonry, usually as external wall, but as sometimes internal feature | | | | | | | |
| | *Chamber* - Centrally placed burial chamber, sometimes block-built, but usually as pit | | | | | | | |
| | *Cist* - Centrally placed stone-lined burial cist | | | | | | | |
| | | | | | | | | |
| **Re-use:** | *Beacon* - Small pile of rocks built of parts of the tumulus fill - sometimes with a certain possibility of it being a Beduin grave marker | | | | | | | |
| | *Building* - Nearby ruins of secondary buildings having used tumulus material for construction | | | | | | | |
| | *Encl.* - Stone enclosure near or abutting an older tumulus and constructed from its material | | | | | | | |
| | *Grafitti* - Arabian writing or images on slabs or stones in or near tumulus | | | | | | | |
| | *Grave* - Beduin grave erected on or near tumulus from its material | | | | | | | |
| | *Shelter* - Small windbreak or shelter from the elements nearby constructed from tumulus material | | | | | | | |
| | | | | | | | | |
| **Condition:** | *D.* (disturbed), *H. D.* (heavily disturbed), *S. D.* (slightly disturbed), *T. D.* (totally destroyed) and *r. l.* (recently looted) | | | | | | | |
| | | | | | | | | |
| **Communicative context:** | | Entries of two perspectives *(a/b)* suggest - *a:* The tumulus as an individual structure, *b:* The tumulus as part of a group | | | | | | |
| | | | | | | | | |
| **No.** | **Type** | **Size (N-S x E-W)** | **Ca. height** | **Comm. context** | **Arch. context** | **Other features** | **Condition** | **Re-use** |
| **2011** | | | | | | | | |
| 156 | Cairn | 5,4 x 6,2 | 50-80 cm | Low | Isolated | - | H. D. | - |
| 157 | Cairn | 5,1 x 4,5 | 60 cm | Low | Group of two | Cist | D. | - |
| 158 | Cairn | 4,1 x4,0 | 70 cm | Low | Group of two | - | H. D. | - |
| 159 | Monumental | 10,5 x 11,5 | Over 120 cm | Farview | Isolated | Dry-stone | D. | Beacons |
| 160 | Monumental | 9,8 x 9,6 | 150 cm | Farview | Isolated | Foot chain; Dry-stone | D. | - |
| 161 | Cairn or turret | 7,5 x 7,5 | 120 cm | Farview | Isolated | Foot chain; Dry-stone; Chamber | D.; r. l. | - |
| 162 | Cairn | 6,1 x 5,9 | 40-50 cm | Low | Group of two | - | D. | - |
| 163 | Cairn | 4,0 x 4,5 | 40-50 cm | Low | Group of two | - | D.; r. l. | Grafitti |
| 164 | Cairn | 4,0 x 2,8 | 30-40 cm | Nearview | Isolated | Chamber? | H. D. | - |
| 165 | Cairn | 8,2 X 7,8 | 60-70 cm | Nearview | Isolated | - | T. D. | - |
| 166 | Cairn | 3,5 x 3,4 | 60-70 cm | Low | Isolated | - | H. D. | Shelter |
| 167 | Cairn | 4,3 x 4,0 | 50 cm | Low | Isolated | - | H. D. | Grafitti |
| 168 | Cairn or turret | 5,0 x 5,0 | 50 cm | Midview | Group of three | Dry-stone | H. D. | Shelter |
| 169 | Cairn | 2,9 x 3,5 | 40 cm | Low | Group of three | - | H. D. | - |
| 170 | Turret | 3,5 x 3,6 | 60 cm | Midview | Group of three | Dry-stone | D. | - |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 171 | Monumental | 9,8 x 9, 2 | 150 cm | Farview | Isolated | - | D.; r. l. | - |
| 172 | Cairn | 7,3 x 6,6 | 80-90 cm | Farview | Isolated | - | H. D.; r. l. | Shelter |
| 173 | Cairn | 7,3 x 6,9 | 50-60 cm | Farview | Group of three | - | H. D.; r. l. | - |
| 174 | Cairn | 3,8 x 4,0 | 30-40 cm | Low | Group of three | - | D.; r. l. | - |
| 175 | Cairn | 3,7 x 3,7 | 40 cm | Low | Group of three | - | D. | - |
| 176 | Cairn | 6,2 x 6,2 | 40 cm | Midview | Isolated | Perimeter; Chamber | H. D.; r. l. | Encl.? |
| 177 | Monumental | 8,6 x 8,8 | 120 cm | Farview | Group of two | Foot chain | D.; r. l. | Shelter |
| 178 | Cairn | 4,4 x 5,0 | 40 cm | Low | Group of two | - | D.; r. l. | - |
| 179 | Cairn | 5,2 x 5,2 | 30-40 cm | Midview | Isolated | - | H. D.; r. l. | - |
| 180 | Cairn | - | - | - | Isolated | - | T. D. | Beacons |
| 181 | Monumental | 9,5 x 9,0 | 100 cm | Farview | Group of two | - | D.; r. l. | Grafitti/grave? |
| 182 | Monumental | 12,0 x 9,0 | 50-60 cm | Farview | Group of two | - | D.; r. l. | - |
| 183 | Cairn | 7,0 x 6,5 | 50 cm | Low | Group of three | - | H. D.; r. l. | - |
| 184 | Cairn | 5,0 x 5,3 | 50 cm | Low | Group of three | - | H. D.; r. l. | - |
| 185 | Cairn | 6,0 x 5,0 | 80-90 cm | Farview | Group of three | - | D. | - |
| 186 | Cairn | 8,0 x 9,0 | 70 cm | Midview | Isolated | - | T. D. | Shelter |
| 187 | Monumental | 10,5 x 11,0 | 70 cm | Midview | Isolated | - | H. D.; r. l. | Grafitti/shelter |
| 188 | Cairn | 8,0 x 7,3 | 60 cm | Farview | Isolated | Blocks | H. D.; r. l. | - |
| 189 | Cairn | 6,0 x 5,3 | 50 cm | Farview | Isolated | Dry-stone | D. | - |
| 190 | Cairn | 6,0 x 5,5 | 50 cm | Farview | Isolated | - | H. D.; r. l. | - |
| 191 | Cairn | 9,2 c 8,3 | 60 cm | Farview | Isolated | - | H. D. | - |
| 192 | Cairn? | - | - | Nearview | Isolated | Roman structures? | H. D.? | - |
| 193 | Cairn? | - | - | Nearview | Isolated | Roman structures? | H. D.? | - |
| 194 | Cairn or mound | 4,0 x 4,0 | 40-50 cm | Nearview/Farview | Complex | - | D. (no photo) | Encl.? |
| 195 | Monumental | 13,0 x 13,0 | 60 cm | Midview/Farview | Complex | Foot chain | D. (no photo) | Encl.? |
| 196 | Cairn or mound | 6,2 x 6,6 | 40 cm | Nearview/Farview | Complex | Chamber | D. (no photo) | Encl.? |
| 197 | Cairn or mound | 4,3 x 4,1 | 40 cm | Nearview/Farview | Complex | - | D. (no photo) | Encl.? |
| 198 | Cairn or mound | 4,6 x 4,3 | 40-50 cm | Nearview/Farview | Complex | Perimeter | D. (no photo) | Encl.? |
| 199 | Mound | 6,0 x 6,0 | 40 cm | Nearview | Isolated | Foot chain? | D.; r. l. | - |
| 200 | Cairn | 6,0 x 6,0 | 40-50 cm | Midview | Isolated | - | D. | - |
| 201 | Cairn | 4,2 x 4,1 | 50-60 cm | Farview | Isolated | Foot chain? | D. | - |
| 202 | Mound | 5,2 x 5,3 | 20-30 cm | Low | Isolated | - | S. D. | - |
| 203 | Mound | 4,1 x 4,0 | 20-30 cm | Low | Isolated | - | S. D. | - |
| 204 | Mound | c. 4,0 x 4,0 | 20-30 cm | Low | Group of two | - | D. | - |
| 205 | Mound | c. 4,0 x 4,0 | 20-30 cm | Low | Group of two | - | S. D. | - |

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|---|---|---|---|---|---|---|---|---|
| 206 | Cairn | 5,4 x 5,1 | 40-50 cm | Low | Isolated | - | D. | - |
| 207 | Cairn | 4,8 x 4,4 | 40-50 cm | Low | Isolated | - | D. | - |
| 208 | Cairn | 5,2 x 5,0 | 30-50 cm | Low/Farview | Complex | - | D. | - |
| 209 | Cairn | 5,8 x 5,2 | 30-50 cm | Low/Farview | Complex | - | D. | - |
| 210 | Cairn | 3,1 x 3,4 | 30-50 cm | Low/Farview | Complex | - | D. | - |
| 211 | Cairn | c. 3,0 x 3,0 | 30-50 cm | Low/Farview | Complex | - | D. | - |
| 212 | Cairn | 4,2 x 3,9 | 30-50 cm | Low/Farview | Complex | - | D. | - |
| 213 | Cairn | c. 3,0 x 3,0 | 30-50 cm | Low/Farview | Complex | - | D. | - |
| 214 | Cairn | c. 3,0 x 3,0 | 30-50 cm | Low/Farview | Complex | - | D. | - |
| 215 | Cairn | 4,0 x 4,3 | 30-50 cm | Low/Farview | Complex | - | D. | - |
| 216 | Cairn | c. 4,0 x 4,0 | 30-50 cm | Low/Farview | Complex | - | D. | - |
| 217 | Cairn | 4,5 x 4,2 | 30-50 cm | Low/Farview | Complex | - | D. | - |
| 218 | Cairn | 6,6 x 6,3 | 30-50 cm | Low/Farview | Complex | - | D. | - |
| 219 | Cairn | 4,4 x 4,6 | 40 cm | Low | Group of two | Perimeter | H. D. | - |
| 220 | Mound | 3,6 x 3,7 | 20-30 cm | Low | Group of two | - | D. | - |
| 221 | Mound | 3,8 x 3,5 | 20-30 cm | Low | Isolated | - | D. | - |
| 222 | Mound | c. 3,5 x 3,5 | 20-30 cm | Low | Group of two | - | D. | Grave |
| 223 | Cairn or mound | c. 4,0 x 4,0 | 20-40 cm | Low | Group of two | - | H. D. | Grave |
| 224 | Mound | 5,5 x 5,8 | 20-30 cm | Low | Isolated | - | D. | - |
| 225 | Cairn or mound | c. 3,0 x 3,0/7,9 x 7 | 50/20-30 cm | Low | Isolated | - | D. | - |
| 226 | Cairn | 5,8 x 6,2 | 50 cm | Low/Midview | Group of three | Perimeter | D. | Grave |
| 227 | Cairn or mound | c. 3,0 x 4,0/7,2 x 7 | 50/20-30 | Low/Midview | Group of three | - | D. | Grave? |
| 228 | Cairn | 2,0 x 2,1 | 30-40 cm | Low/Midview | Group of three | - | D. | - |
| 229 | Mound | 3,2 x 2,6 | 20-30 cm | Nearview/Midview | Complex | - | S. D. | - |
| 230 | Cairn or mound | 4,2 x 4,4 | 20-40 cm | Nearview/Midview | Complex | - | D. | - |
| 231 | Mound | 4,6 x 4,5 | 20-30 cm | Nearview/Midview | Complex | Chamber | D.; r. l. | - |
| 232 | Mound | 2,9 x 3,0 | 20-30 cm | Nearview/Midview | Complex | - | S. D. | - |
| 233 | Mound | 3,4 x 4,4 | 20-30 cm | Nearview/Midview | Complex | Chamber? | D.; r. l. | - |
| 234 | Mound | 2,2 x 3,9 | 20-30 cm | Nearview/Midview | Complex | - | D. | - |
| 235 | Mound | 2,7 x 2,0 | 20 cm | Nearview/Midview | Complex | - | S. D. | - |
| 236 | Mound | 4,8 x 5,6 | 20-30 cm | Nearview | Isolated | - | D. | - |
| 237 | Mound | 8,4 x 8,0 | 20-30 cm | Nearview | Isolated | Foot chain | D. | Grave |
| 238 | Cairn | c. 4,0 x 4,0 | 40-50 cm | Farview | Isolated | - | H. D.; r. l. | Graves? |
| 239 | Cairn or mound | 6,2 x 5,8 | 50/20-30 cm | Low | Group of three | - | D.; r. l. | Grave? |
| 240 | Mound | 5,1 x 4,6 | 20-30 cm | Low | Group of three | - | S. D. | - |

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|---|---|---|---|---|---|---|---|---|
| 241 | Mound | 2,9 x 2,9 | 20 cm | Low | Group of three | - | S. D. | - |
| 242 | Cairn or mound | 7,1 x 7,1 | 40-50 cm | Midview | Group of two | - | D. | Grave? |
| 243 | Mound | 4,4 x 4,6 | 20 cm | Low | Group of two | - | S. D. | - |
| 244 | Mound | 6,2 x 6,3 | 20-30 cm | Midview | Isolated | - | S. D. | - |
| 245 | Cairn | 6,8 x 7,5 | 50-60 cm | Farview/Farview | Group of three | - | D. | - |
| 246 | Monumental | 8,2 x 9,1 | 60-70 cm | Farview/Farview | Group of three | - | D. | - |
| 247 | Cairn | 6,1 x 5,8 | 40-50 cm | Midview/Farview | Group of three | - | D. | - |
| 248 | Cairn | 4,1 x 4,1 | 30-40 cm | Midview | Group of two | Perimeter | H. D. | Graves |
| 249 | Cairn | 4,0 x 4,0 | 30-40 cm | Midview | Group of two | - | D. | Graves |
| 250 | Cairn or mound | 9,5 x 8,4 | 50/20-30 cm | Nearview | Group of two | - | S. D. | - |
| 251 | Mound | 8,5 x 6,8 | 20-30 cm | Nearview | Group of two | - | S. D. | - |
| 252 | Turret | 5,8 x 5,6 | 70-90 cm | Midview | Isolated | Blocks; Dry-stone | H. D. | - |
| 253 | Cairn | 7,8 x 7,7 | 50-60 cm | Farview | Group of two | Foot chain? | D.; r. l. | - |
| 254 | Cairn or mound | 5,6 x 5,4 | 50/20-30 cm | Low | Group of two | - | D. | - |
| 255 | Cairn | 7,1 x 6,9 | 100 cm | Farview | Group of three | - | D. | - |
| 256 | Cairn | 5,5 x 5,7 | 40-50 cm | Low | Group of three | Perimeter | H. D. | - |
| 257 | Cairn or mound | 3,4 x 2,7 | 20-30 cm | Low | Group of three | - | D. | - |
| 258 | Cairn | 4,0 x 3,0 | c. 50 cm | Low | Group of two | Chamber | H. D. | Shelter |
| 259 | Cairn or mound | c. 4,0 x 4,0 | 50/20-30 cm | Low | Group of two | Chamber | D. | - |
| 260 | Cairn or mound | 7,8 x 7,5 | 50/20-30 cm | Low | Isolated | - | D. | - |
| 261 | Cairn | - | - | Low at present | Isolated | - | H. D. | Shelter |
| 262 | Cairn | 4,8 x 4,3 | 50-60 cm | Low | Isolated | - | H. D. | - |
| 263 | Cairn | 4,8 x 5,3 | 40-50 cm | Low | Isolated | - | H. D. | Beacon |
| 264 | Cairn | 6,0 x 5,7 | 40-50 cm | Low | Isolated | - | D. | - |
| 265 | Turret | 5,7 x 5,5 | 80-90 cm | Midview | Isolated | Dry-stone; Chamber | H. D.; r. l. | - |
| 266 | Monumental | 9,3 x 9,5 | 150 cm | Farview | Isolated | Foot chain | D. | - |
| 267 | Cairn or turret | 5,9 x 5,8 | 110 cm | Farview | Isolated | Dry-stone? | H. D.; r. l. | - |
| 268 | Monumental | 10,5 x 9,5 | 130 cm | Farview | Isolated | - | D. | - |
| 269 | Cairn | 2,6 x 2,9 | 40-50 cm | Low | Isolated | Chamber? | H. D. | - |
| 270 | Turret | 5,6 x 6,1 | 70-80 cm | Farview | Isolated | Dry-stone | D.; r. l. | - |
| 271 | Cairn | 5,2 x 5,0 | 70-80 cm | Farview | Isolated | - | D.; r. l. | Shelter |
| 272 | Monumental | 10,7 x 6,5 | 50-60 cm | Farview | Isolated | - | H. D.; r. l. | Shelter |
| 273 | Cairn | c. 6,0 x 6,0 | 60-70 cm | Midview | Isolated | - | D.; r. l. | - |
| 274 | Cairn? | - | - | - | Complex? | Roman structures? | T. D.? | Building? |
| 275 | Cairn? | - | - | - | Complex? | Roman structures? | T. D.? | Building? |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 276 | Cairn? | - | - | - | Complex? | Roman structures? | T. D.? | Building? |
| 277 | Cairn? | - | - | - | Complex? | Roman structures? | T. D.? | Building? |
| 278 | Cairn? | - | - | - | Complex? | Roman structures? | T. D.? | Building? |
| 279 | Cairn? | - | - | - | Complex? | Roman structures? | T. D.? | Building? |
| 280 | Cairn? | - | - | - | Complex? | Roman structures? | T. D.? | Building? |
| 281 | Cairn? | - | - | - | Complex? | Roman structures? | T. D.? | Building? |
| 282 | Cairn? | - | - | - | Complex? | Roman structures? | T. D.? | Building? |
| 283 | Cairn? | - | - | - | Complex? | Roman structures? | T. D.? | Building? |
| 284 | Cairn? | - | - | - | Complex? | Roman structures? | T. D.? | Building? |
| 285 | Cairn | Not meas. | Not meas. | Midview | Group of two | Chamber | D. (no photo) | - |
| 286 | Cairn | Not meas. | Not meas. | Midview | Group of two | Chamber | D. (no photo) | - |
| 287 | Cairn | 4,8 x 5,1 | c. 40-50 cm | Low | Isolated | Blocks | H. D.; r. l. | - |
| 288 | Cairn | 4,8 x 4,8 | - | Low | Isolated | Perimeter | D. (no photo) | - |
| 289 | Mound | 5,1 x 4,3 | 20-30 cm | Nearview | Group of two | - | D. | - |
| 290 | Mound | 4,1 x 3,5 | 20-30 cm | Nearview | Group of two | - | S. D. | - |
| 291 | Cairn | 6,5 x 6,0 | 50 cm | Low | Group of two | Blocks | H. D. | Shelter |
| 292 | Cairn | 6,5 x 6,2 | 60 cm | Low | Group of two | Blocks | H. D. | - |
| 293 | Cairn | 5,5 x 6,4 | 40-50 cm | Low | Isolated | Blocks | H. D. | - |
| 294 | Cairn | Not meas. | Over 70 cm | Farview | Isolated | Unknown (no descr.) | D. | Unknown |
| 295 | Tumulus | Not meas. | Not meas. | Unknown | Isolated | Unknown (no descr.) | U. (no photo) | Unknown |
| 296 | Cairn or mound | c. 3,5 x 3,5 | 50/20-30 cm | Low | Group of three | - | D. | Shelter |
| 297 | Cairn or mound | Not meas. | 20-30 cm | Low | Group of three | Unknown (no descr.) | D. (no photo) | Unknown |
| 298 | Cairn or mound | Not meas. | 20-30 cm | Low | Group of three | Unknown (no descr.) | D. (no photo) | Unknown |
| 299 | Cairn | Not meas. | Over 50 cm | Midview | Isolated | Unknown (no descr.) | D. | Unknown |
| 300 | Tumulus | Not meas. | Not meas. | Unknown | Isolated | Unknown (no descr.) | D. (no photo) | Unknown |
| 301 | Cairn or turret | c. 5,0 x 5,0 | c. 60-70 cm | Midview | Isolated | Dry-stone | D. | - |
| 302 | Cairn or turret | 5,0 x 5,3 | c. 60-70 cm | Midview | Isolated | Dry-stone | H. D.; r. l. | - |
| 303 | Cairn | 3,5 x 3,4 | 40-50 cm | Midview | Isolated | - | D.; r. l. | - |
| 304 | Cairn | 4,3 x 5,3 | 30-40 cm | Midview | Isolated | Perimeter | D. | Building? |
| 305 | Cairn | 5,0 x 5,0 | Not meas. | Midview | Isolated | Unknown (no photo) | D. (no photo) | - |
| 306 | Cairn or mound | 5,4 x 5,2 | 50/20-30 cm | Nearview | Isolated | Perimeter | D.; r. l. | Beacon? |
| 307 | Cairn | 4,2 x 4,5 | 30-40 cm | Nearview | Isolated | Perimeter | D. | - |
| 308 | Cairn or mound | 5,6 x 5,8 | Not meas. | Nearview | Group of two | Unknown (no descr.) | D. | - |
| 309 | Cairn or mound | Not meas. | Not meas. | Nearview | Group of two | Unknown (no descr.) | H. D. | - |
| 310 | Turret | 4,5 x 5,0 | c. 50-60 cm | Midview | Isolated | Dry-stone; Cist | D. | - |

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|---|---|---|---|---|---|---|---|---|
| 311 | Cairn | 5,5 x 5,5 | 50-60 cm | Midview | Isolated | - | H. D. | Shelter |
| 312 | Cairn or turret | 5,5 x 5,6 | 80-90 cm | Midview | Isolated | Dry-stone | H. D.; r. l. | Building |
| 313 | Cairn | c. 6,5 x 6,5 | 30-50 cm | Farview | Isolated | - | H. D. | Shelter |
| 314 | Cairn | c. 4,0 x 4,0 | 30-40 cm | Low/Midview | Group of two | - | D. | Building |
| 315 | Cairn | 3,4 x 3,6 | 30-40 cm | Low/Midview | Group of two | - | D. | Building |
| 316 | Mound | 4,3 x 3,8 | 20-30 cm | Low | Group of two | - | S. D. | - |
| 317 | Cairn or turret | 6,8 x 6,6 | 40-50 cm | Midview | Group of two | Blocks; Dry-stone | H. D. | - |
| 318 | Cairn | 5,0 x 4,9 | 30-40 cm | Midview | Group of two | - | D. | - |
| 319 | Cairn | 5,8 x 4,7 | 30-40 cm | Midview | Group of two | - | D. | - |
| 320 | Cairn | 4,8 x 4,0 | 30-40 cm | Low | Isolated | Perimeter | D. | - |
| 321 | Cairn | 6,6 x 6,1 | 40-50 cm | Midview | Isolated | Blocks | D. | - |
| 322 | Cairn | c. 6,0 x 6,0 | 60-70 cm | Midview | Isolated | Blocks | D. | - |
| 323 | Monumental | 9,2 x 9,8 | 90 cm | Farview | Group of two | - | D. | - |
| 324 | Cairn | 3,6 x 4,3 | 30-40 cm | Low | Group of two | - | D. | - |
| 325 | Cairn | c. 3,5 x 3,5 | 20-30 cm | Midview | Isolated | - | T. D. | - |
| 326 | Cairn | Not meas. | Not meas. | Farview | Group of two | - | H. D. | Shelter |
| 327 | Mound | c. 3,0 x 3,0 | 20-30 cm | Low | Group of two | - | D. | - |
| 328 | Monumental | 9,3 x 8,8 | 50-60 cm | Farview/Farview | Group of three | Blocks | H. D. | Shelter |
| 329 | Cairn | 7,5 x 8,3 | 50-60 cm | Midview/Farview | Group of three | - | D. | - |
| 330 | Cairn | 4,7 x 4,8 | 30-40 cm | Low/Farview | Group of three | Chamber? | D. | - |
| 331 | Cairn or turret | 6,3 x 6,3 | 40-50 cm | Midview | Group of two | Dry-stone | D. | - |
| 332 | Cairn | 5,0 x 4,8 | 30-40 cm | Midview | Group of two | Blocks | D. | - |
| 333 | Cairn | c. 2,0 x 2,0 | 20-30 cm | Low | Isolated | - | D. | - |
| 334 | Cairn or turret | 4,3 x 4,8 | 30-40 cm | Midview | Isolated | Perimeter; Dry-stone | H. D. | - |
| 335 | Cairn | c. 4,0 x 4,0 | 50-60 cm | Midview | Isolated | - | D. | Shelter |
| 336 | Cairn | 5,9 x 6,1 | 40-50 cm | Midview | Isolated | Perimeter | D. | - |
| 337 | Mound | c. 2,5 x 2,5 | 20 cm | Low | Isolated | - | D. | - |
| 338 | Cairn or mound | 3,5 x 3,9 | Not meas. | Unknown | Isolated | Unknown (no descr.) | U. (no photo) | Unknown |
| 339 | Mound | 6,1 x 6,3 | 20-30 cm | Nearview | Isolated | - | D. | - |
| 340 | Mound | 6,4 x 5,5 | Not meas. | Midview | Isolated | Perimeter; Chamber | U. (no photo) | - |
| 341 | Mound | c. 5,0 x 5,0 | 20-30 cm | Midview | Group of two | - | D. | - |
| 342 | Cairn or mound | c. 5,0 x 5,0 | 60/20-30 cm | Midview | Group of two | - | D. | Beacon? |
| 343 | Monumental | c. 9,5 x 9,5 | 110 cm | Farview | Isolated | - | S. D. | Beacon |
| 344 | Cairn | Not meas. | Not meas. | Midview | Isolated | Unknown (no descr.) | U. (no photo) | Unknown |
| 345 | Mound | c. 4,0 x 4,0 | 20 cm | Low | Isolated | - | S. D. | - |

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|---|---|---|---|---|---|---|---|---|
| 346 | Cairn or turret | 5,6 x 5,7 | 50-60 cm | Midview | Isolated | Dry-stone | H. D. | - |
| 347 | Cairn | 5,7 x 6,0 | 40-50 cm | Midview | Isolated | - | D. | - |
| 348 | Cairn | 4,2 x 3,8 | 30-40 cm | Midview | Isolated | - | D. | Shelter |
| 349 | Cairn? | c. 4,0 x 4,2 | Not meas. | Low | - | Beacon? | - | - |
| 350 | Cairn | c. 5,0 x 5,0 | 20 cm | Poss. Nearview | Isolated | Perimeter | H. D. | - |
| 351 | Cairn | c. 6,0 x 6,0 | 30-40 cm | Midview | Isolated | Perimeter | D. | - |
| 352 | Cairn | 5,4 x 5,2 | 40-50 cm | Midview | Isolated | - | H. D. | Shelter |
| 353 | Cairn | 4,3 x 4,2 | 30-40 cm | Midview | Isolated | Blocks; Chamber | H. D. | Shelter |
| 354 | Cairn | 6,5 x 6,1 | 40-50 cm | Midview | Group of two | - | D. | - |
| 355 | Cairn | c. 3,5 x 3,5 | 30-40 cm | Midview | Group of two | - | D. | Beacon |
| 356 | Cairn | 7,6 x 7,5 | 70-80 cm | Midview | Isolated | Blocks | D. | - |
| 357 | Cairn | c. 6,0 x 6,0 | 50-60 cm | Midview | Isolated | - | T. D. | - |
| 358 | Turret | 5,9 x 7,3 | 60-70 cm | Midview | Isolated | Blocks; Dry-stone | H. D. | - |
| 359 | Turret | c. 5,0 x 5,0 | 60-70 cm | Midview | Group of two | Dry-stone | D. | - |
| 360 | Cairn | c. 6,0 x 6,0 | 50-60 cm | Midview | Group of two | - | H. D.; r. l. | - |
| 361 | Mound | 5,6 x 4,2 | 20-30 cm | Nearview | Complex | - | D. | - |
| 362 | Mound | 7,0 x 6,8 | 30-40 cm | Nearview | Complex | - | D. | - |
| 363 | Cairn or mound | 5,8 x 5,0 | 30-40 cm | Nearview | Complex | Perimeter? | D. | - |
| 364 | Cairn | 5,5 x 5,3 | 40-50 cm | Nearview | Complex | - | D. | - |
| 365 | Cairn | 6,4 x 5,7 | 30-40 cm | Nearview | Complex | - | D. | - |
| 366 | Mound | 4,5 x 4,9 | 20-30 cm | Nearview | Complex | - | D. | - |
| 367 | Turret | 5,2 x 4,5 | 60-70 cm | Midview | Isolated | Dry-stone | H. D.; r. l. | - |
| 368 | Cairn | 3,7 x 3,5 | 30-40 cm | Midview | Isolated | Perimeter | H. D. | - |
| 369 | Turret | 7,2 x 6,7 | 60-70 cm | Midview | Isolated | Dry-stone | H. D. | - |
| 370 | Cairn or mound | c. 6,0 x 4,5 | 30-40 cm | Low | Isolated | - | D. | - |
| 371 | Cairn or mound | Not meas. | Not meas. | Unknown | Isolated | Unknown (no descr.) | H. D. | Beacon |
| 372 | Cairn | 3,6 x 3,3 | 40-50 cm | Low | Isolated | - | D. | Beacon? |
| 373 | Turret | 5,5 x 5,1 | 50-60 cm | Midview | Isolated | Dry-stone | H. D. | - |
| 374 | Turret | 8,1 x 7,8 | 50-60 cm | Midview | Isolated | Dry-stone | H. D. | - |
| 375 | Cairn or turret | 5,4 x 5,2 | 50-60 cm | Midview | Isolated | Dry-stone | H. D. | - |
| 376 | Cairn? | c. 4,0 x 4,0 | 70-80 cm | Midview | - | Windshelter? | - | - |
| 377 | Cairn or turret | 4,6 x 4,9 | 50-60 cm | Midview | Isolated | Perimeter; Dry-stone | H. D. | Shelter |
| 378 | Cairn or turret | 6,0 x 5,4 | 60-70 cm | Midview | Isolated | Dry-stone? | H. D. | - |
| 379 | Turret | 4,4 x 4,7 | 50-60 cm | Midview | Isolated | Dry-stone | D. | - |
| 400 | Cairn or turret | 9,0 x 8,0 | 60-70 cm | Midview | Isolated | Perimeter; Dry-stone | D. | - |

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|---|---|---|---|---|---|---|---|---|
| 401 | Cairn? | 3,8 x 3,5 | 50-60 cm | Low | - | Loot scatter?; Perimeter? | H. D.? | - |
| 402 | Cairn or mound | 3,6 x 3,0 | 50/20-30 cm | Low | Isolated | - | D. | Beacon? |
| 403 | Cairn | c. 4,0 x 4,0 | 50 cm | Low/Midview | Group of two | Perimeter | H. D. | - |
| 404 | Cairn | c. 4,0 x 4,0 | 40-50 cm | Low/Midview | Group of two | - | H. D. | - |
| 405 | Cairn | 3,0 x 3,2 | 30-40 cm | Low | Isolated | Perimeter | H. D. | - |
| 406 | Cairn or turret | 3,8 x 3,8 | 40-50 cm | Midview | Isolated | Dry-stone | D.; r. l. | - |
| 407 | Turret | 5,0 x 5,3 | 80-90 cm | Midview | Isolated | Dry-stone | S. D. | - |
| 408 | Turret | 5,2 x 5,2 | 70-80 cm | Midview | Isolated | Dry-stone | S. D. | - |
| 409 | Turret | c. 6,0 x 8,0 | 70-80 cm | Farview | Isolated | Dry-stone | D.; r. l. | - |
| 410 | Cairn or turret | 7,3 x 7,5 | 70-80 cm | Midview | Group of two | Dry-stone | D. | - |
| 411 | Cairn or turret | 4,0 x 4,0 | 60-70 cm | Midview | Group of two | Dry-stone | H. D.; r. l. | Shelter |
| **2009** | | | | | | | | |
| 1 | Cairn | Not meas. | 30-50 cm | Midview | Isolated | - | T. D. | - |
| 2 | Cairn | Not meas. | Not meas. | Midview | Isolated | - | T. D. | Shelter |
| 3 | Cairn | c. 7,0 x 7,0 | Not meas. | Prob. Farview | Isolated | - | T. D. | Beacons |
| 4 | Cairn or turret | 5,0 x 5,0 | Not meas. | Midview | Isolated | Perimeter | H. D.; r. l. | - |
| 5 | Cairn or turret | 4,5 x 4,5 | 50-60 cm | Midview | Isolated | Dry-stone? | H. D.; r. l. | - |
| 6 | Cairn or turret | 7,5 x 7,0 | 50-60 cm | Midview | Group of two | Blocks; Dry-stone; Chamber | H. D.; r. l. | Beacon |
| 7 | Monumental | c. 15,0 x 15,0 | Over 130 cm | Farview | Group of two | Chamber | H. D.; r. l. | - |
| 8 | Cairn | 7,5 x 7,5 | Not meas. | Midview | Isolated | Perimeter | H. D.; r. l. | Beacon |
| 9 | Monumental | Over 10,0 x 10,0 | Over 100 cm | Farview | Group of three | Dry-stone | D.; r. l. | - |
| 10 | Cairn | Not meas. | Not meas. | Low | Group of three | - | H. D.; r. l. | - |
| 11 | Cairn | Not meas. | Not meas. | Low | Group of three | - | H. D.; r. l. | - |
| 12 | Cairn | c. 8,0 x 8,0 | 40-50 cm | Midview | Complex | Foot chain | H. D.; r. l. | - |
| 13 | Monumental | c. 10,0 x 9,0 | 60-70 cm | Midview | Complex | Foot chain; Cist; Chamber | D.; r. l. | - |
| 14 | Mound | c. 7,0 x 7,0 | 20-30 cm | Low | Complex | - | D. | - |
| 15 | Cairn | c. 3,0 x 3,0 | Not meas. | Low | Complex | - | H. D. | - |
| 16 | Mound | c. 5,0 x 5,0 | 20-30 cm | Low | Complex | - | D. | - |
| 17 | Mound | c. 5,0 x 5,0 | 20-30 cm | Low | Complex | - | D. | Grave |
| 18 | Mound | c. 5,0 x 5,0 | 20-30 cm | Low | Complex | - | D. | - |
| 19 | Cairn | c. 5,5 x 5,5 | 40-50 cm | Midview | Complex | - | D. | - |
| 20 | Cairn? | c. 4,0 x 4,0 | 30-40 cm | Low | Complex | Platform? | D.? | - |
| 21 | Monumental | Over 10,0 x 10,0 | 70-80 cm | Farview | Complex | Foot chain | D. | - |
| 22 | Cairn | c. 6,0 x 2,5 | 30-40 cm | Low | Complex | - | D. | Grave |
| 23 | Cairn | c. 4,0 x 4,0 | 30-40 cm | Low | Complex | - | H. D. | - |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 24 | Cairn or mound | c. 3,0 x 3,0 | 20-30 cm | Low | Complex | - | D. | - |
| 25 | Cairn | Not meas. | Not meas. | Midview | Isolated | Foot chain | T. D. | Shelter |
| 26 | Cairn | Not meas. | Not meas. | Midview | Isolated | - | T. D. | Shelter |
| 27 | Cairn | Not meas. | Not meas. | Midview | Isolated | Foot chain | H. D. | Shelter |
| 28 | Monumental | Over 10,0 x 10,0 | Not meas. | Farview | Isolated | - | D. | Shelters |
| 29 | Monumental | Over 10,0 x 10,0 | Not meas. | Farview | Isolated | - | D. | - |
| 30 | Monumental | c. 10,0 x 10,0 | 40-50 cm | Nearview | Group of two | - | S. D. | - |
| 31 | Monumental | 13,0 x 13,0 | 50-60 cm | Nearview | Group of two | Foot chain; Perimeter | S. D. | - |
| 32 | Cairn | Not meas. | Not meas. | Midview | Isolated | - | H. D. | Beacon |
| 33 | Monumental | c. 11,0 x 11,0 | c. 50-60 cm | Midview | Isolated | Perimeter | D. | Graves |
| 34a | Mound | 7,0 x 7,0 | 20 cm | Low/Midview | Complex | - | D. | - |
| 34b | Cairn or mound | 5,0 x 5,0 | 20-30 cm | Low/Midview | Complex | - | D. | - |
| 35 | Mound | 5,0 x 5,0 | 20-30 cm | Low/Midview | Complex | - | D. | - |
| 36 | Monumental | c. 10,5 x 10,5 | 50-60 cm | Midview | Complex | - | D. | - |
| 37 | Cairn or mound | 7,0 x 7,0 | 20-30 cm | Low/Midview | Complex | Perimeter; Chamber | D. | - |
| 38 | Mound | 7,3 x 7,3 | 20-30 cm | Low/Midview | Complex | - | S. D. | - |
| 39 | Monumental | c. 12,9 x 10,9 | 40-50 cm | Midview | Group of two | - | H. D. | Encl. |
| 40 | Cairn | c. 9,4 x 8,3 | 30-40 cm | Midview | Group of two | - | H. D. | Encl. |
| 41 | Cairn | 8,2 x 8,3 | 50-60 cm | Midview | Complex | - | D. | - |
| 42 | Monumental | 10,4 x 10,6 | 70-80 cm | Midview | Complex | - | D. | - |
| 43 | Cairn | 5,0 x 5,0 | 30-40 cm | Midview | Complex | - | H. D. | - |
| 44 | Cairn | 5,2 x 6,2 | 30-40 cm | Midview | Complex | - | D. | - |
| 45 | Cairn? | c. 2,0 x 2,0 | 20-30 cm | Low | Isolated | Recent?; Perimeter? | D.? | Grave? |
| 46 | Cairn | c. 9,0 x 8,0 | Not meas. | Midview | Isolated | - | T. D. | - |
| 47 | Cairn | c. 8,5 x 8,5 | Not meas. | Midview | Isolated | - | H. D.; r. l. | - |
| 48 | Cairn or mound | 3,5 x 5,2 | 20-30 cm | Low | Isolated | Perimeter; Chamber | D. | - |
| 49 | Monumental | 12,5 x 13,0 | 200 cm | Farview | Isolated | Dry-stone | D. | - |
| 50 | Monumental | 12,0 x 12,0 | 100-120 cm | Farview | Group of two | - | D. | Grave |
| 51 | Cairn | 6,0 x 6,0 | 40-50 cm | Low | Group of two | - | D. | - |
| 52 | Cairn | c. 4,0 x 4,0 | 40-50 cm | Midview | Group of two | - | H. D. | Shelter/graves |
| 53 | Cairn or turret | c. 4,0 x 4,1 | 40-50 cm | Midview | Group of two | Blocks; Dry-stone | H. D. | Shelter/graves |
| 54 | Cairn | c. 3,0 x 3,0 | 20-30 cm | Low/Midview | Complex | Blocks; Perimeter | D. | - |
| 55 | Monumental | c. 12,0 x 12,0 | 50-60 cm | Midview | Complex | Foot chain | D. | - |
| 56 | Cairn | Not meas. | Not meas. | Low/Midview | Complex | - | D. (no photo) | - |
| 57 | Cairn | Not meas. | Not meas. | Low/Midview | Complex | Perimeter | D. (no photo) | - |

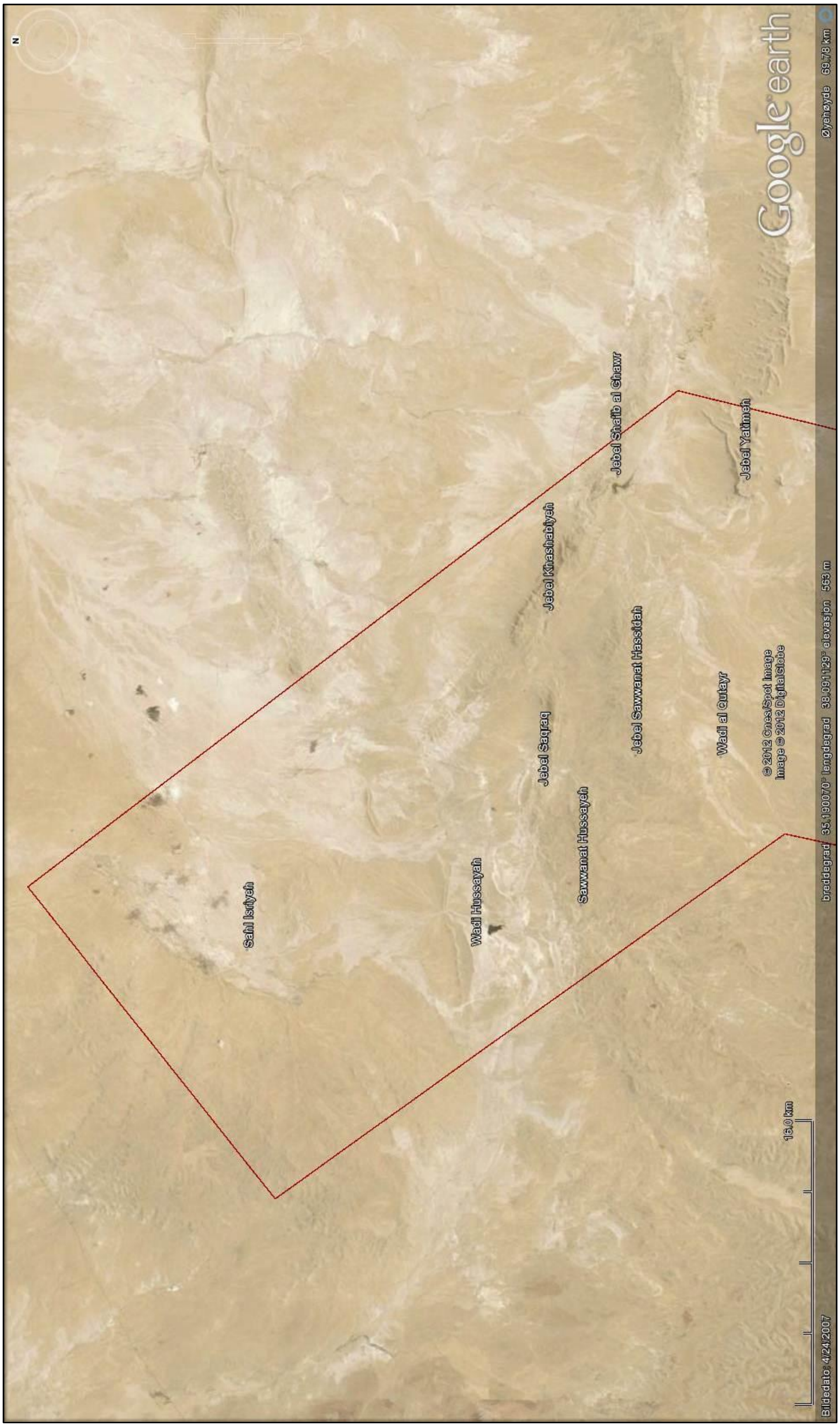
| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 58 | Cairn | 8,2 x 7,3 | 50-60 cm | Midview | Group of two | - | D.; r. l. | Shelter |
| 59 | Cairn | 4,1 x 4,1 | 20-30 cm | Low | Group of two | - | T. D. | - |
| 60 | Cairn | c. 7,5 x 9,0 | 50-60 cm | Midview | Isolated | - | H. D. | Grave |
| 61 | Cairn or turret | 8,2 x 8,2 | 50-60 cm | Midview | Group of three | Blocks; Dry-stone | H. D. | - |
| 62 | Cairn or turret | 7,5 x 9,2 | 50-60 cm | Midview | Group of three | Blocks; Dry-stone | H. D. | - |
| 63 | Cairn? | c. 9,0 x 7,3 | Not meas. | Low | Group of three | Perimeter | T. D.? | - |
| 64 | Monumental | 13,0 x 16,0 | Over 100 cm | Farview | Isolated | Blocks | H. D. | - |
| 65 | Monumental | 10,8 x 10,0 | 70-80 cm | Farview | Isolated | Blocks | H. D. | - |
| 66 | Cairn | c. 5,0 x 4,5 | 40-50 cm | Farview | Group of two | - | H. D. | - |
| 67 | Cairn | c. 6,0 x 5,0 | 50-60 cm | Farview | Group of two | - | D. | - |
| 68 | Monumental | 10,5 x 10,5 | 60-70 cm | Farview | Group of two | Blocks; Dry-stone | D. | - |
| 69 | Turret | c. 6,5 x 6,5 | 40-50 cm | Midview | Group of two | Dry-stone | H. D. | - |
| 70 | Cairn or turret | c. 3,5 x 4,0 | 50-60 cm | Midview | Group of three | Dry-stone | D. | Shelter |
| 71 | Cairn or turret | c. 5,0 x 5,0 | 70-80 cm | Midview | Group of three | Blocks; Dry-stone | H. D. | - |
| 72 | Monumental | c. 10,0 x 8,0 | Over 100 cm | Farview | Group of three | Blocks; Dry-stone | D. | - |
| 73 | Turret | c. 4,0 x 4,0 | 40-50 cm | Midview | Isolated | Dry-stone | D. | - |
| 74 | Turret | c. 6,0 x 6,0 | 50-60 cm | Midview | Isolated | Dry-stone | H. D. | - |
| 75 | Turret | c. 7,5 x 7,5 | Over 120 cm | Farview | Isolated | Dry-stone | S. D. | Shelter |
| 76 | Cairn | 5,0 x 5,0 | 20-30 cm | Midview | Isolated | - | H. D.; r. l. | - |
| 77 | Cairn | c. 7,5 x 7,5 | 70-80 cm | Midview | Group of three | Foot chain; Cist | D. | - |
| 78 | Cairn or turret | c. 5,5 x 5,5 | 40-50 cm | Midview | Group of three | Dry-stone | H. D. | Beacon |
| 79 | Cairn or turret | c. 5,5 x 5,5 | 50-60 cm | Midview | Group of three | Dry-stone; Cist | D. | - |
| 80 | Cairn | 6,5 x 6,5 | 60-70 cm | Midview | Isolated | - | D. | Grave? |
| 81 | Cairn | 8,5 x 8,5 | 60-70 cm | Farview | Group of two | Perimeter | D. (no photo) | Shelter |
| 82 | Cairn | c. 4,3 x 4,0 | 40-50 cm | Low | Group of two | Cist | H. D.; r. l. | Beacon |
| 83 | Cairn or turret | 4,5 x 4,5 | Not meas. | Low | Isolated | Blocks | H. D. | Beacon/graves |
| 84 | Monumental | 9,8 x 9,7 | Over 200 cm | Midview | Group of three | - | D. | Graves |
| 85 | Cairn | 3,2 x 3,0 | Not meas. | Low/Midview | Group of three | Perimeter | H. D. | Graves |
| 86 | Cairn | 7,0 x 6,6 | 80-90 cm | Midview | Group of three | - | D.; r. l. | Graves |
| 87 | Cairn | c. 7,0 x 7,0 | 90-100 cm | Midview | Isolated | - | H. D. | - |
| 88 | Cairn | c. 5,0 x 4,0 | Not meas. | Nearview | Group of two | Perimeter | H. D.; r. l. | Encl. |
| 89 | Cairn | 7,0 x 7,5 | Not meas. | Nearview | Group of two | Perimeter | H. D. | - |
| 90 | Cairn | 7,5 x 7,5 | Not meas. | Nearview | Isolated | Perimeter | T. D. | Graves/encl. |
| 91 | Cairn | 6,5 x 6,0 | 50-60 cm | Nearview | Group of two | - | H. D.; r. l. | Encl. |
| 92 | Cairn | 6,4 x 6,4 | 30-40 cm | Nearview | Group of two | Perimeter | H. D. | Encl. |

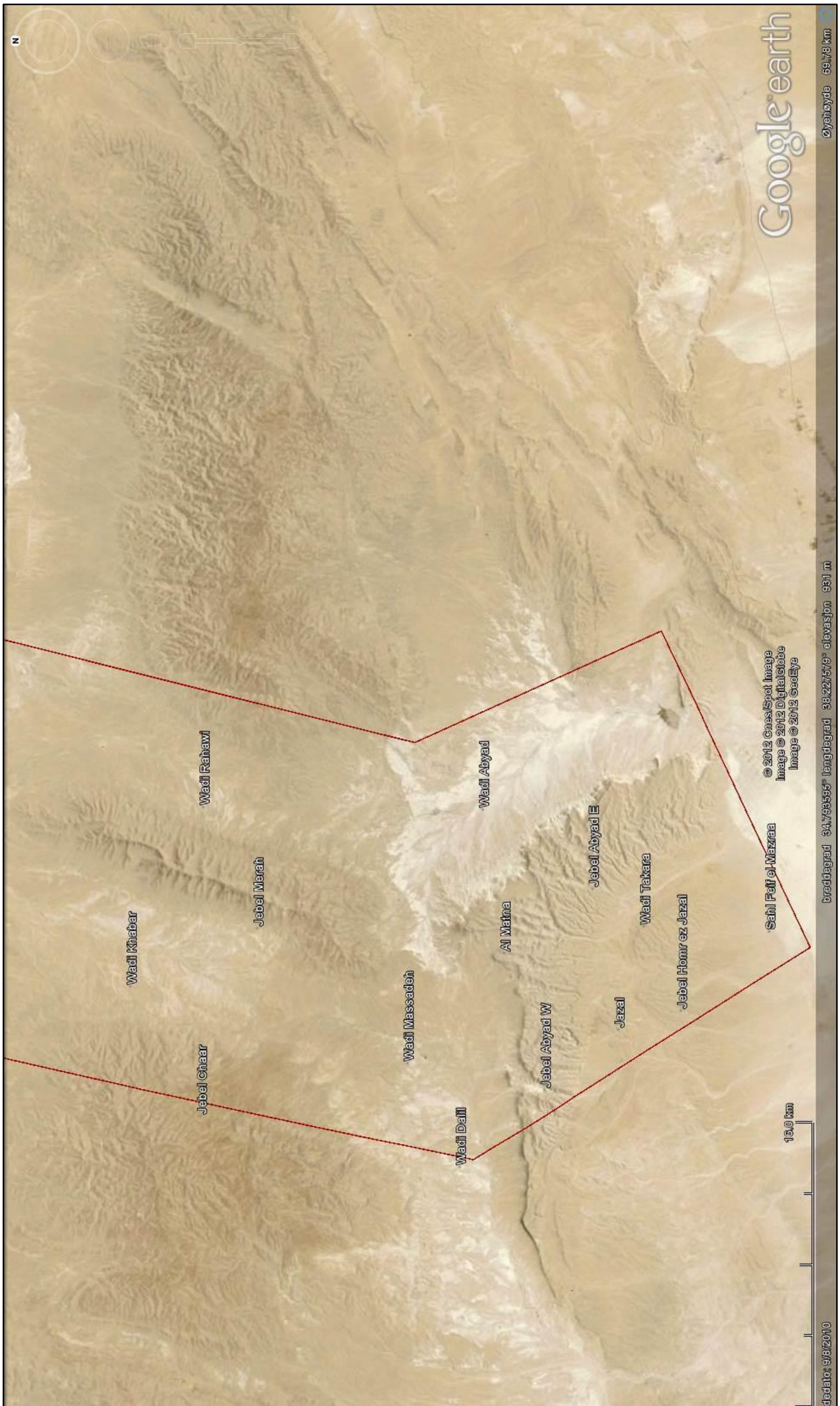
| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 93 | Cairn | c. 6,0 x 6,0 | 40-50 cm | Nearview | Isolated | - | D. | Encl. |
| 94 | Cairn or turret | c. 6,0 x 7,0 | Over 100 cm | Midview | Complex | Dry-stone | D. | - |
| 95 | Cairn | 5,1 x 5,1 | 40-50 cm | Midview | Complex | Perimeter | H. D.; r. l. | - |
| 96 | Cairn | 2,7 x 2,7 | 30-40 cm | Low/Midview | Complex | Perimeter | H. D.; r. l. | - |
| 97 | Cairn | 3,5 x 3,5 | 30-40 cm | Low/Midview | Complex | Perimeter | H. D.; r. l. | - |
| 98 | Monumental | 10,6 x 10,6 | Over 120 cm | Farview | Group of two | - | D. | Beacon |
| 99 | Cairn | 2,5 x 2,5 | Not meas. | Low | Group of two | - | H. D. | Shelter |
| 100 | Cairn | 3,1 x 3,4 | 20-30 cm | Midview | Isolated | Perimeter | H. D. | - |
| 101 | Cairn | 5,1 x 5,1 | 40-50 cm | Midview | Isolated | - | H. D. | Beacon/graves |
| 102 | Cairn | 7,2 x 7,4 | 80-90 cm | Midview | Isolated | Foot chain; Perimeter | D. | - |
| 110 | Cairn | c. 8,5 x 8,5 | Over 120 cm | Farview | Isolated | Foot chain | S. D. | - |
| 111 | Cairn or turret | 6,5 x 6,5 | 60-70 cm | Midview | Isolated | Blocks; Dry-stone | D. | Beacon? |
| 112 | Cairn or turret | 9,2 x 8,3 | 60-70 cm | Midview | Isolated | Blocks | H. D.; r. l. | Beacon |
| 113 | Cairn | 4,7 x 4,7 | 30-40 cm | Midview | Isolated | - | H. D. | - |
| 114 | Cairn | 7,3 x 7,1 | 80-90 cm | Midview | Group of two | - | D. | - |
| 115 | Cairn or mound | 5,4 x 5.4 | 30-40 cm | Low/Midview | Group of two | - | D. | - |
| 116 | Cairn | 7,0 x 7,4 | 70-80 cm | Midview | Isolated | - | S. D. | - |
| 117 | Cairn | 5,2 x 5,2 | 30-40 cm | Low | Isolated | - | H. D. | - |
| 118 | Cairn | 8,5 x 8,5 | 70-80 cm | Midview | Isolated | - | S. D. | - |
| 120 | Cairn | 5,2 x 4,5 | 40-50 cm | Low | Isolated | - | H. D. | - |
| 121 | Cairn | 4,3 x 4,8 | 40-50 cm | Nearview | Isolated | - | H. D.; r. l. | - |
| 122 | Monumental | 14,0 x 14,5 | Over 140 cm | Farview | Group of two | Foot chain | D.; r. l. | - |
| 123 | Cairn | 5,0 x 4,5 | 40-50 cm | Low | Group of two | - | H. D.; r. l. | - |
| 124 | Cairn | c. 4,0 x 4,0 | Not meas. | Low | Isolated | - | T. D. | Shelter |
| 125 | Cairn | c. 4,0 x 4,0 | 60-70 cm | Nearview | Isolated | - | D.; r. l. | - |
| 126 | Cairn | 6,5 x 7,8 | 50-60 cm | Midview | Isolated | - | H. D.; r. l. | - |
| 127 | Cairn | 5,2 x 5,2 | 70-80 cm | Midview | Isolated | - | H. D.; r. l. | Beacon |
| 128 | Cairn | c. 4,8 x 4,8 | 30-40 cm | Low/Farview | Complex | - | H. D.; r. l. | - |
| 129 | Cairn | c. 4,0 x 4,0 | Not meas. | Low/Farview | Complex | - | H. D. | - |
| 130 | Monumental | 9,6 x 9,6 | 80-90 cm | Farview | Complex | - | H. D.; r. l. | - |
| 131 | Cairn | 8,0 x 8,0 | 50-60 cm | Low/Farview | Complex | - | H. D.; r. l. | - |
| 132 | Cairn | c. 4,0 x 4,0 | 30-40 cm | Low/Farview | Complex | - | H. D.; r. l. | - |
| 133 | Cairn | c. 4,0 x 4,0 | 30-40 cm | Low/Farview | Complex | - | H. D.; r. l. | - |
| 134 | Cairn | c. 3,6 x 3,6 | 30-40 cm | Low/Farview | Complex | - | H. D.; r. l. | Shelter |
| 135 | Monumental | 10,0 x 9,5 | Over 100 cm | Farview | Isolated | - | D. | - |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 136 | Cairn | 6,0 x 7,0 | 50-60 cm | Midview | Isolated | - | H. D.; r. l. | - |
| 137 | Cairn | 5,0 x 5,5 | Not meas. | Low | Isolated | - | T. D. | Shelters |
| 138 | Cairn | 5,0 x 5,0 | Not meas. | Midview | Isolated | - | T. D. | Beacon |
| 139 | Cairn or mound | 2,6 x 2,6 | 40/20 cm | Low | Isolated | - | D. | - |
| 140 | Cairn | 7,5 x 7,5 | 80-90 cm | Midview | Group of two | Foot chain; Perimeter | D. | Shelter |
| 141 | Cairn | c. 5,0 x 5,0 | 50-60 cm | Midview | Group of two | Foot chain? | D. | - |
| 142 | Cairn | c. 4,0 x 4,0 | 40-50 cm | Midview | Isolated | - | H. D. | - |
| 143 | Cairn | c. 4,0 x 4,0 | 30-40 cm | Nearview | Isolated | Perimeter | H. D. | Beacon |
| 144 | Cairn | 4,7 x 4,0 | 30-40 cm | Midview | Isolated | - | H. D. | Beacons |
| 145 | Monumental | 9,3 x 10,0 | Over 140 cm | Farview | Isolated | Foot chain | S. D. | - |
| 146 | Cairn | 5,5 x 5,5 | 20-30 cm | Low | Group of two | Perimeter | D. | - |
| 147 | Cairn | 5,5 x 5,6 | 50-60 cm | Midview | Group of two | - | D. | - |
| 148 | Cairn | 5,5 x 5,0 | 40-50 cm | Midview | Isolated | - | H. D. | Beacon |
| 149 | Cairn or mound | 3,0 x 3,0 | 20-30 cm | Low | Group of two | - | D. | - |
| 150 | Cairn | 5,0 x 5,0 | 40-50 cm | Midview | Group of two | - | H. D. | Beacon |
| 151 | Mound | 2,7 x 2,7 | 20-30 cm | Low | Isolated | - | S. D. | - |
| 152 | Mound | c. 3,0 x 3,0 | 20-30 cm | Low | Isolated | - | S. D. | - |
| 154 | Cairn | 7,0 x 7,8 | 40-50 cm | Midview | Isolated | - | D. | - |
| 155 | Cairn | c. 5,0 x 5,0 | 40-50 cm | Midview | Isolated | Unknown (no descr.) | D. | - |
| 333 (2009) | Tumulus | Unknown | Unknown | Unknown | Isolated | Unknown | U. (no photo) | - |
| 365a (2009) | Cairn | c. 5,0 x 5,0 | 30-40 cm | Nearview | Group of two | - | H. D. | - |
| 365b (2009) | Cairn | c. 5,0 x 5,0 | 30-40 cm | Nearview | Group of two | Perimeter | T. D. | Encl. |
| 377a (2009) | Cairn | c. 7,0 x 7,0 | 20-30 cm | Midview | Group of two | - | H. D. | - |
| 377b (2009) | Mound | c. 6,0 x 6,0 | 20-30 cm | Nearview | Group of two | Chamber | H. D. | - |
| 443 | Tumulus | Unknown | Unknown | Midview | Group of two | Unknown | U. (no photo) | - |
| 444 | Tumulus | Unknown | Unknown | Midview | Group of two | Unknown | U. (no photo) | - |
| 153a | See no. 94-97 | - | - | - | - | - | - | - |
| 153b | See no. 94-98 | - | - | - | - | - | - | - |
| 341 | See no. 155 | - | - | - | - | - | - | - |
| 382 | See no. 154 | - | - | - | - | - | - | - |
| 438 | See no. 12-16 | - | - | - | - | - | - | - |
| 440 | See no. 17-24 | - | - | - | - | - | - | - |
| **2008** | | | | | | | | |
| 1 (Matna) | Cairn or mound | c. 9,0 m dia | 40-50 cm | Midview | Isolated | Perimeter | H. D. | Encl. |
| 2 (Matna) | Cairn | c. 7,0 x 7,0 m | 40-60 cm | Midview | Complex | - | D. | - |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3 (Matna) | Cairn | c. 6,0 x 6,0 m | 40-60 cm | Midview | Complex | - | D. | - |
| 4 (Matna) | Monumental | 10,0 x 9,0 m | 50-60 cm | Midview | Complex | - | D. | - |
| 5 (Matna) | Cairn | c. 6,0 x 6,0 m | 30-40 cm | Midview | Complex | Cist? | D. | - |
| 6 (Matna) | Cairn or mound | c. 3,0 x 3,0 | 20-30 cm | Nearview | Complex | Cist | D. | - |
| 7 (Matna) | Tumulus | Unknown | Unknown | Unknown | Complex | Unknown | U. (no photo) | - |
| 8 (Matna) | Tumulus | Unknown | Unknown | Unknown | Complex | Unknown | U. (no photo) | - |
| 9 (Matna) | Cairn | c. 6,0 x 6,0 m | 30-40 cm | Nearview | Isolated | Perimeter | H. D. | Encl. |
| 10 (Matna) | Cairn? | 7,7 x 7,2 m | Unknown | Nearview | Isolated | Cist? | H. D.? | Encl. |
| 1 (Merah) | Monumental | 11,0 x 11,0 | 70-100 cm | Farview | Isolated | - | D. | Encl. |
| 2 (Merah) | Cairn | c. 3,0 x 3,0 | 20-30 cm | Low | Isolated | Perimeter; Chamber | H. D. | - |
| 3 (Merah) | Cairn | 3,0 x 4,0 m | 20-30 cm | Low | Isolated | Perimeter; Chamber | H. D.; r. l. | - |
| B01 | Tumulus | Unknown | Unknown | Unknown | Group of two | Unknown | U. (no photo) | - |
| B02 | Tumulus | Unknown | Unknown | Unknown | Group of two | Unknown | U. (no photo) | - |
| B03 | Mound | c. 4,5 x 4,5 | 10-20 cm | Unknown | Group of three | Perimeter | D. | - |
| B04 | Tumulus | Unknown | Unknown | Unknown | Group of three | Unknown | U. (no photo) | - |
| B05 | Mound | c. 5,5 x 5,5 | 10-20 cm | Unknown | Group of three | Perimeter | D. | - |
| B06 | Cairn | c. 6,5 x 6,5 | 40-50 cm | Unknown | Isolated | - | D. | Encl. |
| B07 | Tumulus | Unknown | Unknown | Unknown | Isolated | Unknown | U. (no photo) | - |
| B08 | Tumulus | Unknown | Unknown | Unknown | Isolated | Unknown | U. (no photo) | - |
| B09 | Tumulus | c. 14,0 x 6,0 | Unknown | Unknown | Group of three | - | D. | - |
| B10 | Monumental | c. 12,0 x 12,0 | Unknown | Unknown | Group of three | Foot chain; Dry-stone | D. | - |
| B11 | Tumulus | Unknown | Unknown | Unknown | Group of three | Unknown | U. (no photo) | - |
| B12 | Tumulus | Unknown | Unknown | Unknown | Isolated | Unknown | U. (no photo) | - |
| B13 | Turret | Unknown (large) | Over 140 cm | Unknown | Isolated | Dry-stone | D. | - |
| B14 | Tumulus | Unknown | Unknown | Unknown | Isolated | Unknown | U. (no photo) | - |
| B15 | Tumulus | Unknown | Unknown | Unknown | Isolated | Unknown | U. (no photo) | - |
| B16 | Tumulus | Unknown | Unknown | Unknown | Isolated | Unknown | U. (no photo) | - |
| B17 | Tumulus | Unknown | Unknown | Unknown | Isolated | Unknown | U. (no photo) | - |
| B18 | Tumulus | Unknown | Unknown | Unknown | Isolated | Unknown | U. (no photo) | - |
| B19 | Tumulus | Unknown | Unknown | Unknown | Isolated | Unknown | U. (no photo) | - |
| B20 | Turret | Unknown | 40-50 cm | Unknown | Isolated | Dry-stone | D. | - |
| B21 | Tumulus | Unknown | Unknown | Unknown | Isolated | Unknown | U. (no photo) | - |

## 8.2 Appendix 2: Palmyrena project survey area

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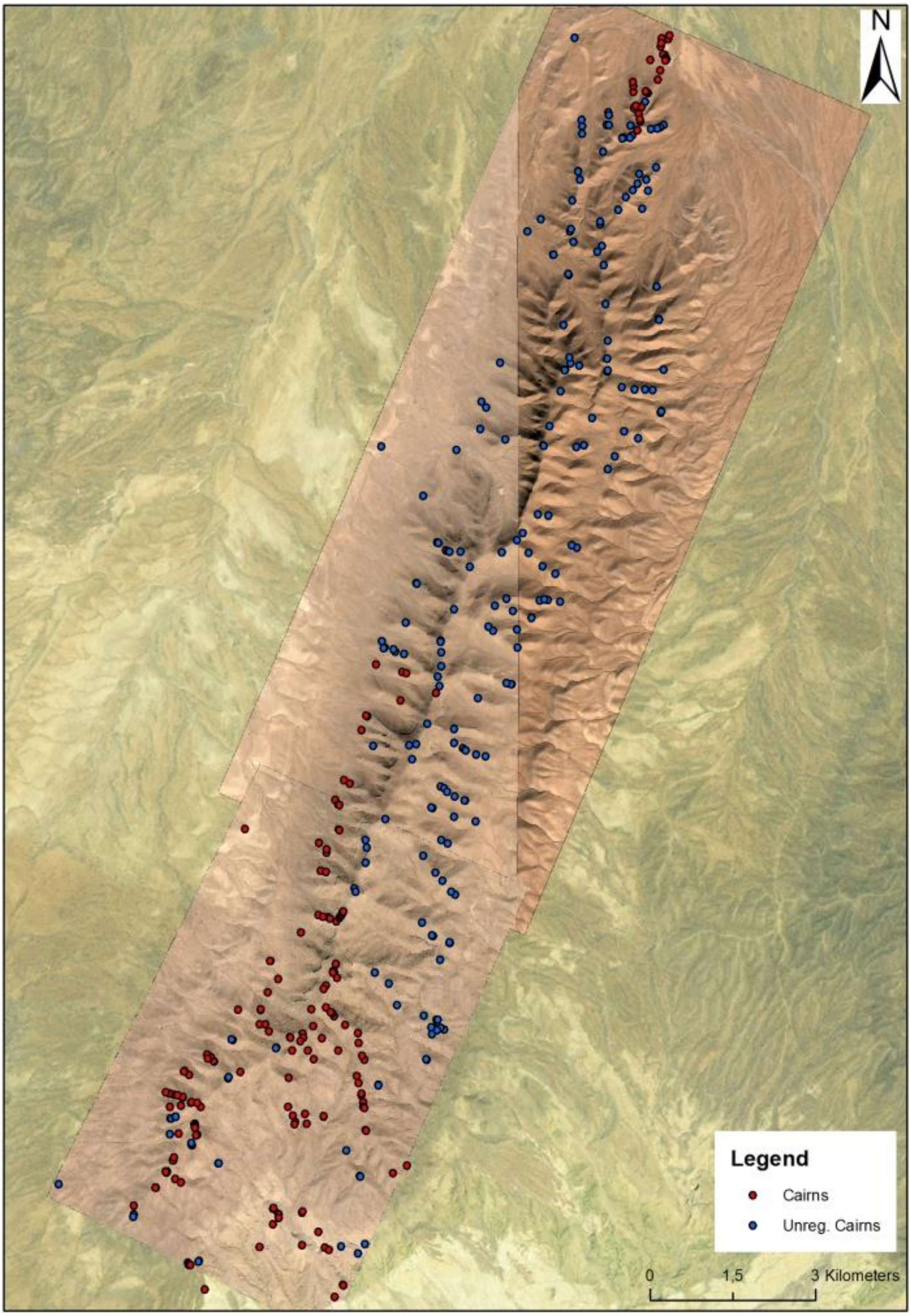
Jebel Chaar
Wadi Rahawi
Jebel Merah
Wadi Massadeh
Wadi Dalil
Wadi Abyad
Al Matna
Jebel Abyad E
Jebel Abyad W
Jazal
Wadi Takara
Jebel Homr ez Jazal
Sahl Feif el Mazraa
© 2012 Cnes/Spot Image
Image © 2012 DigitalGlobe
Image © 2012 GeoEye
Bildedato: 9/8/2010
15,0 km
Google earth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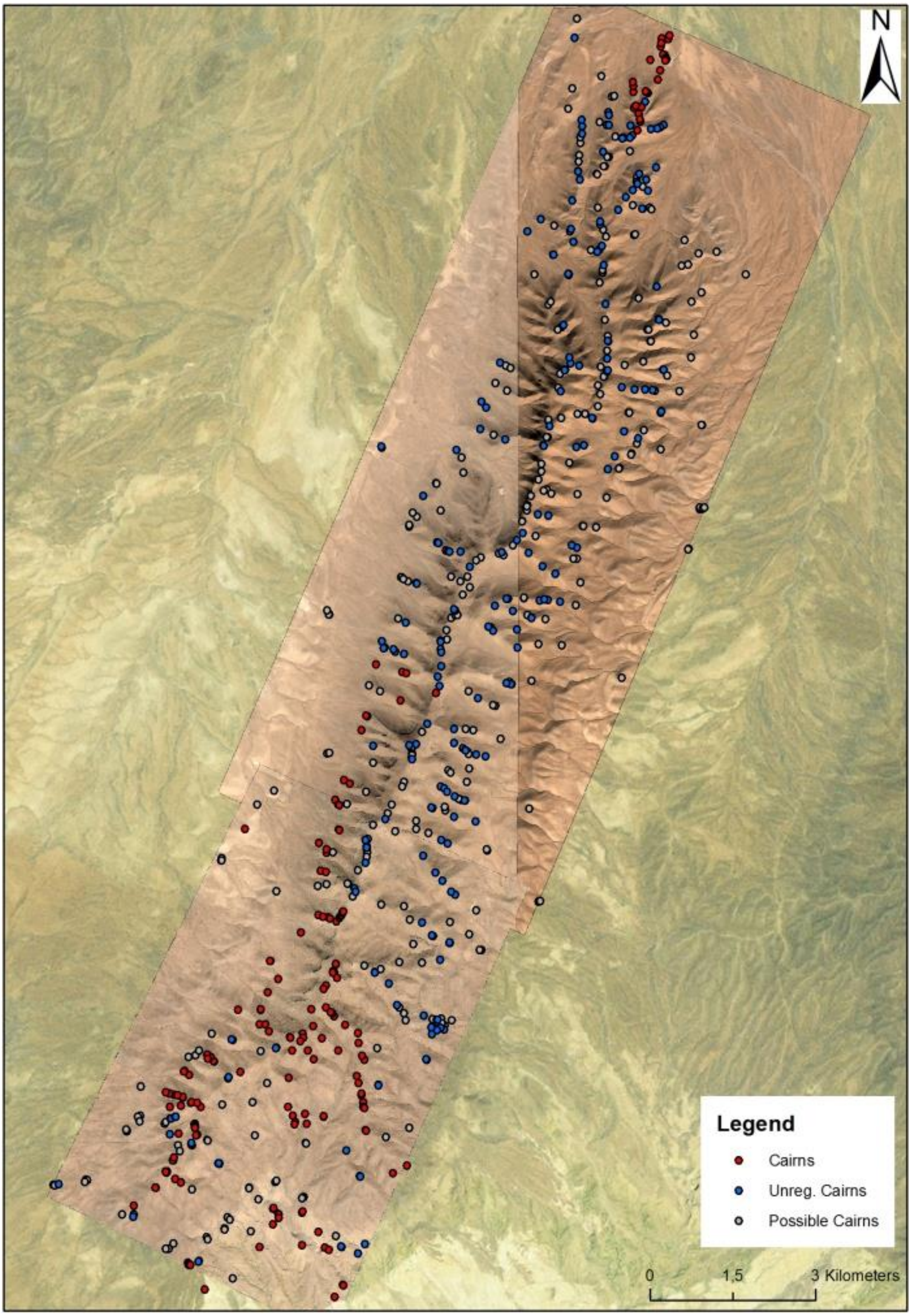
Legend
Cairns
Unreg. Cairns
0
1,5
3 Kilometers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Cairns
Unreg. Cairns
Possible Cairns
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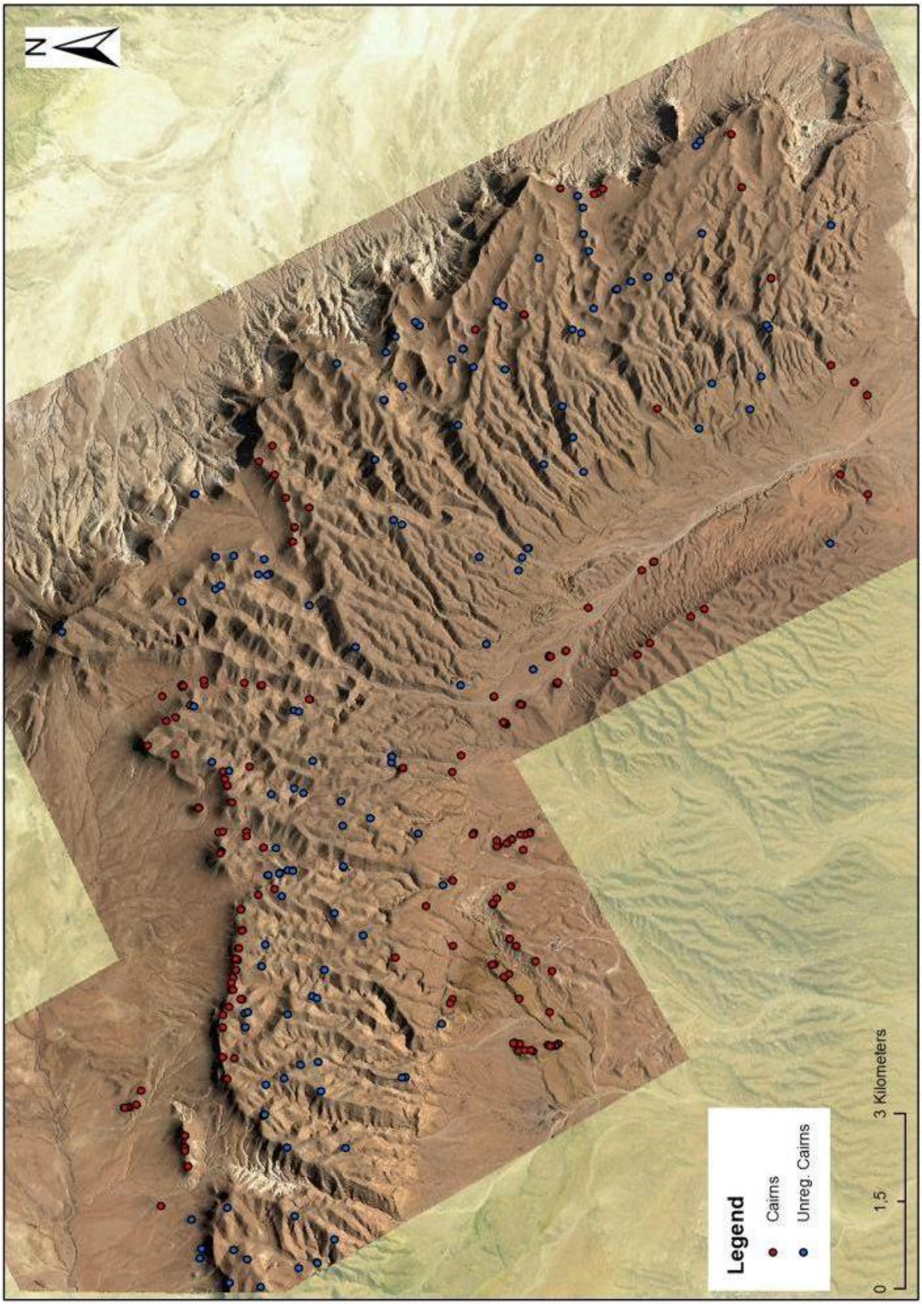
1,5
3 Kilometers


N
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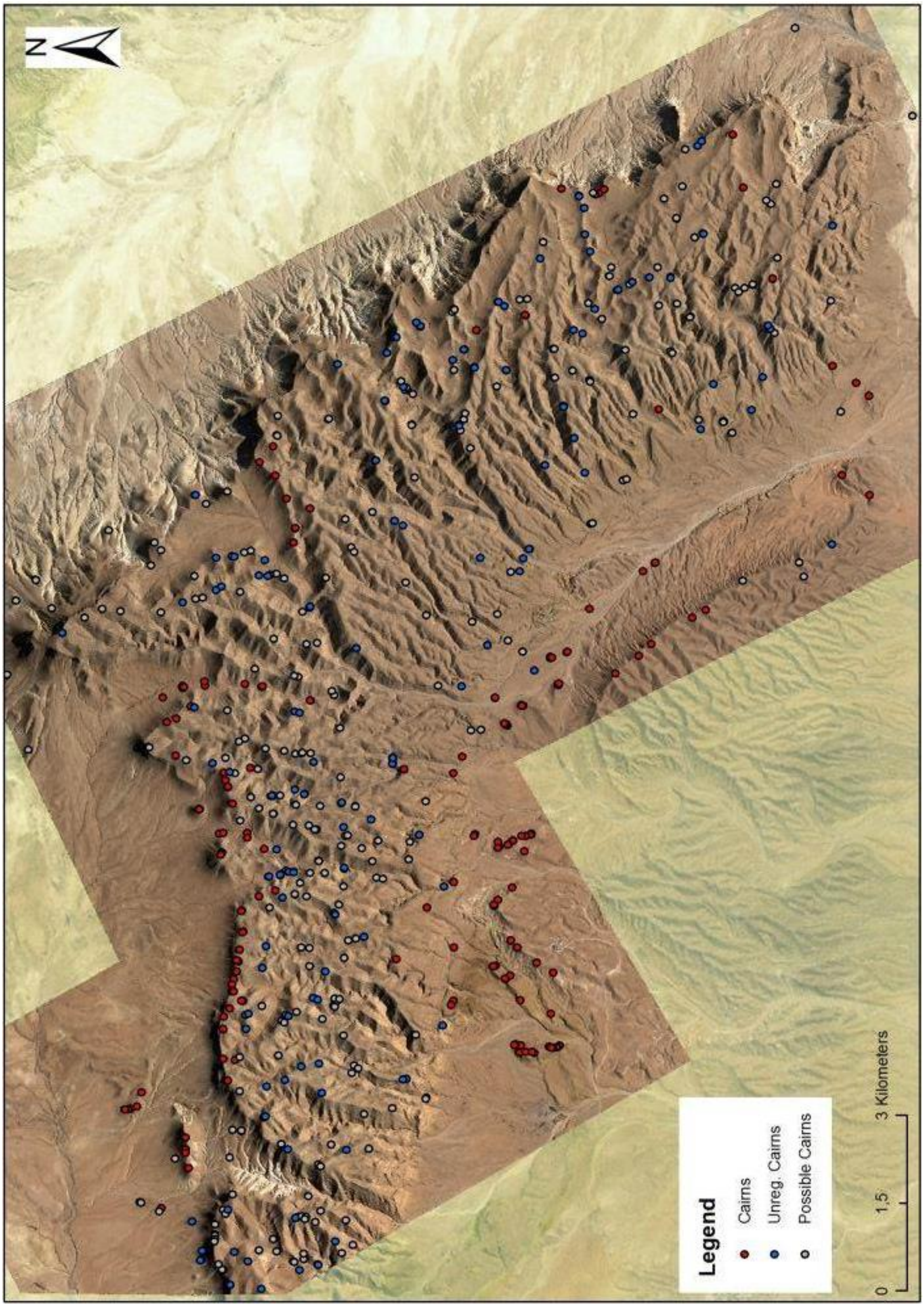
Cairns
Unreg. Cairns
0
1,5
3 Kilometers


N
Legend
Cairns
Unreg. Cairns
Possible Cairns
0
1,5
3 Kilometers

# 8.3 Appendix 3: Topographical division for Google Earth survey

| Region | Region Name | Region inclusive (local names deduced from French and Soviet maps and/or www.geographic.org) |
|---|---|---|
| 1 | Jebel Shaar | Jebel Shaar/Tulûl el Khabar/Wadi el Kheurbet Mfadde |
| 2 | Wadi Khabar | Wadi Khabar/Wadi Shalaleh/Dahr esh Shateb/Bir esh Shenâai |
| 3 | Jebel Merah | Jebel el Merah S/Jebel Zoumlet el Khansîr/Tanîyet ez Zerr/Qalaat Treiye |
| 4 | Wadi Massadeh | Wadi ad Dalil/Wadi Massadeh/Wadi Jhar |
| 5 | Jebel Abyad W | Jebel Mazrur/Jebel Aarfa/Jebel el Masek/Jebel ad Dalil |
| 6 | Al Matna | Jebel al Matna/Wadi el Masek/Tell Shalaleh/Wadi Shaaite/Jebel ez Zuweita |
| 7 | Jebel Abyad E | Jebel Khsheibe/Jebel Dâr Baida/Jebel Yetîme/Jebel Mqeitaa |
| 8 | Jazal | Bîr el Jazal/Tell el Aarfa/Sateh ej Jazal |
| 9 | Wadi Takara | Wadi et Takâra/Wadi Khsheibe/Tell Tshelâbne |
| 10 | Jebel Homr ej Jazal | Jebel Homr ej Jazal/S part of Wadi ez Zaab, Wadi Jazal and Wadi Jeirâne |
| 11 | Al Diwa | Sahl Feif el Mazraâ/Wadi al Diwa/Dahr el Qubbah |
| 12 | Western Palmyra | Steppe west of J. Haiyane, incl. Bîr Treifâwi, Naqâqîb Abu Fawâriss, Wadi el Mashqûqa, Wadi es Sahle and Wadi el Ghazw |
| 13 | Tulul Rwaissate | Tulûl er Rwaissâte/mid-Wadi el Ghazw |
| 14 | Jebel Haiyan | Jebel Haiyane/Jebel el Qâyed/Jebel el Aassâfir/Tulûl er Ramlâte/Tell Sarâssîr |
| 15 | Jebel Tar en Nuwaysir | Jebel Târ en Nuwaysir/Dahr Rwaissâte Abu Fâres/Mazraat Abu Fawâriss |
| 16 | Jebel Marbat el Hassane | Jebel Marbat el Hassan/Râss Aanntar/Tell Zelkha/Tell et Tamra |
| 17 | Wadi Abyad | Wadi Abyad/Dahr Rhâret en Nasr/Wadi Zqâqîye/Wadi Turkmânîye/Duhûr el Mkeimen/Duhur el Aarda |
| 18 | Wadi Rahawi | Wadi er Rahawi/Wadi Sleim/Wadi el Hawîye |
| 19 | Jebel Abu Rujmein | Jebel Abu Rujmein (incl. all ranges east of Fâyej Tanîyet el Hawâ SW - Jebel Qaraa Jaber, Kheurbet Dbeiss,<br>Jebel Rejem el Qneiss, Jebel el Buweida, Tulûl el Mastâha, Rejem Saadûn, Jebel Deffâai, Jebel Bîr es Saiyâh) |
| 20 | Duhur Nuqur el Habiye | Duhûr Nuqûr el Habîye/Tulûl Jere et Tair/Wadi Derrâj/Wadi es Sikke/Wadi el Majrude |
| 21 | Jebel Safra | Jebel es Safra/Jebel Mashquqet Safra/Jebel ed Deraa/Wadi es Safra |
| 22 | Dahr el Qettar | Dahr el Qettâr/Wadi Bseilâne |
| 23 | Jebel Mohamed ibn Ali | J. Mohamed ibn Ali/Jebel Qettâr/Jebel Qalaat el Heri/Jebel Harrâzîye/Jebel Ubeyreh/Jebel Mazâr/Jebel Mashqûq Abadâne |
| 24 | Palmyra | Palmyra-Tadmor/Tell el Aaweimir |
| 25 | Bir Mounsef | Bîr el Mounsef |
| 26 | Jebel Duwara | Jebel ad Dûwâra/Râss el Harrâr/Dahr en Nkeil/Dahr el Mhasse/Tell el Mqâtaa |
| 27 | Dahr el Moussoum | Dahr el Moussoûm/Dahr el Yoûssefîye/Tell Belaoûm |
| 28 | Jebel Rass Aaqabet | Jebel Râss Aaqabet esh Shuweyr/Tell Rawda |
| 29 | Jebel Shaara | Jebel esh Shaara |
| 30 | Jebel Hawit er Rass | Jebel Hawît er Râss S/Fâyej Tanîyet el Hawâ SE/Wadi Qutqut SW |
| 31 | Jebel Abu el Hawr | Jebel Abu el Hawr/Wadi Qutqut SE/Mrhâret Umm Aasfûr NW/Tell el Bader |
| 32 | Jebel Waariye | Jebel el Waarîye/Wadi Waarîye |
| 33 | Jebel Youssefîye | Jebel el Yoûssefîye/Jebel Qalaat Kafeine |
| 34 | Wadi Qseibe | Wadi Qseibe N/Wadi Mzabbad/Wadi Waarîye S |
| 35 | Kheurbet el Qbeibe | Kheurbet el Qbeibe/Dahr ed Dehrâje/Tell Seffâri |
| 36 | Dahr el Mosri | Dahr el Mosri |
| 37 | Biâr el Hawuz Hlale | Biâr el Hawuz Hlâle (betw. Wadi Aabeiye and Wadi Hlâle)/Jebel ed Duwâhkîye |
| 38 | Jebel Qleilate | Jebel Qleilate/Tell Umm Khessem |
| 39 | Wadi Fayej | Wadi el Fâyej |
| 40 | Jebel Satih | Jebel es Satih/Râss Khannsi/Mrhâret Umm Aasfûr SE/Jebel er Reissîye S |
| 41 | Wadi Sahil | Wadi es Sahîl/Wadi el Kebîr W |
| 42 | Jebel Rakbet el Mezraq | Jebel Rakbet el Mezrâq |
| 43 | Wadi Mashaai | Wadi el Mashâai/Dahr Shaqîf Dabbâss |
| 44 | Dahr el Hazem | Dahr el Hazem/Bîr Lafi |
| 45 | Soukhne | Soukhne/Jbail Tanntûr |
| 46 | Wadi Neqeib | Wadi en Neqeib/Tell en Neqeib |
| 47 | Wadi Kebir | Wadi el Kebîr/Tell esh Shaqîf el Ghurâb |
| 48 | Jebel Dahek esh Sharqi | Jebel ed Dâhek esh Sharqi/Wadi Ghadbân/Tell Kheshêm el Baghl/Wadi el Buwayb |
| 49 | Jebel Dahek | Jebel ed Dâhek |
| 50 | Wadi Latum | Wadi el Latûm/Wadi el Kharrûbe/Wadi Dâbbah/Wadi Ghadbân |
| 51 | Wadi Adima | Wadi el 'Adîmah/Shârat Adîmah S |
| 52 | Wadi Maiyalate | Wadi el Maiyâlâte E/Tell Rweimîye |
| 53 | Tulul Maiyalate | Tulûl el Maiyâlâte/Tell Tanîyet et Taibe |
| 54 | Wadi Abu Nallah | Wadi Abu Nallah/Wadi el Maiyâlâte W/Wadi er Ruhaybeh |
| 55 | Jebel Dahek el Gharbi | Jebel Dâhek el Gharbi/Wadi ed Dâhek/Tell el Kharrûbe/Dahr el Matla/Wadi Umm Khasim/Al Latûm |
| 56 | Tulul al Bayda | Tulûl al Bayda/Jebel Qal'at Nawwâr S/Wadi Nuwayr S |
| 57 | Wadi Sahil N | Wadi es Sahîl N/Tulûl el Khûrîyâte/Sheikh Wâssil/Wadi Qutqut N/Wadi el Mahlabîye N/Wadi er Riyahiye |
| 58 | Wadi Sheqif el Aabd | Wadi Sheqîf el Aabd/Bîr es Sleib/Tilâl el Muqtafiye |
| 59 | Jebel Taniyet es Safra | J. Tanîyet es Safra/Wadi el Mahlabîye S/Dahr Shaibate et Tair/Wadi Rawâhet Bayda/J. er Reissîye N/J. el Msakhkham |
| 60 | Jebel Hawit er Rass N | Jebel Hawît er Râss N/mid-Wadi Qutqut/Fâyej Tanîyet el Hawâ NE |
| 61 | Jebel Labidah | Jebel Labidah/Jebel el Hamdâ/Jebel el Lubdah/Wadi el 'Asrân |
| **Northern areas** | | **Region inclusive (local names deduced from French and Soviet maps and/or *www.travelingluck.com*)** |
| a | Jebel Asabi | Jebel el Asâbi'/Asâbi' Qadim |
| b | Jebel Yatime | Jebel Yatîme/Tell Yatîme/Tell Barâghith |

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a
b
N
12/7/2012
25 km
© 2012 Cnes/Spot Image
Image © 2012 GeoEye
Google earth
breddegrad 34.732408° lengdegrad 38.644621° elevasjon 574 m
Øyehøyde 109.25 km

# PALMYRENE STRUCTURES - THE NUMBERS

| Total area of high-res. satellite imagery in Google Earth (incl. northern part) | *6534 km²* |
|---|---|

| Region | Tumuli | Kites | Enclosures | Survey cairns | Size (km²) | App. size (km²) | Cairns/km² | |
|---|---|---|---|---|---|---|---|---|
| All | 7528 | 426 | 2353 | 371 | 3799,40 | 3800 | 2,079 | |
| 1 | 5 | 1 | 1636 | 0 | 59,72 | 60 | 0,084 | |
| 2 | 30 | 0 | " | 1 | 43,16 | 43 | 0,718 | |
| 3 | 233 | 2 | " | 161 | 54,34 | 54 | 7,251 | *These (2-10)* |
| 4 | 50 | 0 | " | 18 | 69,37 | 69 | 0,980 | *are including* |
| 5 | 133 | 0 | " | 65 | 42,99 | 43 | 4,606 | *tumuli* |
| 6 | 28 | 0 | " | 15 | 15,08 | 15 | 2,851 | *surveyed on* |
| 7 | 115 | 1 | " | 24 | 59,59 | 60 | 2,333 | *the ground* |
| 8 | 112 | 0 | " | 53 | 17,75 | 18 | 9,296 | |
| 9 | 3 | 0 | " | 29 | 35,12 | 35 | 0,911 | |
| 10 | 104 | 0 | " | 5 | 60,20 | 60 | 1,811 | |
| 11 | 0 | 0 | " | 0 | 133,14 | 133 | 0,000 | |
| 12 | 1 | 0 | " | 0 | 225,80 | 226 | 0,004 | |
| 13 | 15 | 0 | " | 0 | 6,17 | 6 | 2,431 | |
| 14 | 27 | 19 | " | 0 | 64,65 | 65 | 0,418 | |
| 15 | 86 | 2 | " | 0 | 41,01 | 41 | 2,097 | |
| 16 | 46 | 2 | " | 0 | 28,45 | 28 | 1,617 | |
| 17 | 62 | 0 | " | 0 | 160,39 | 160 | 0,387 | |
| 18 | 109 | 0 | " | 0 | 68,20 | 68 | 1,598 | |
| 19 | 752 | 1 | " | 0 | 177,00 | 177 | 4,249 | |
| 20 | 4 | 0 | " | 0 | 64,60 | 65 | 0,062 | |
| 21 | 683 | 27 | " | 0 | 109,48 | 109 | 6,239 | |
| 22 | 60 | 2 | " | 0 | 38,31 | 38 | 1,566 | |
| 23 | 200 | 89 | " | 0 | 70,69 | 71 | 2,829 | |
| 24 | 30 | 3 | " | 0 | 105,15 | 105 | 0,285 | |
| 25 | 0 | 1 | " | 0 | 30,60 | 31 | 0,000 | |
| 26 | 106 | 20 | " | 0 | 93,37 | 93 | 1,135 | |
| 27 | 27 | 0 | " | 0 | 37,51 | 38 | 0,720 | |
| 28 | 72 | 1 | " | 0 | 18,40 | 18 | 3,913 | |
| 29 | 280 | 0 | " | 0 | 53,43 | 53 | 5,241 | |
| 30 | 72 | 0 | " | 0 | 23,05 | 23 | 3,124 | |
| 31 | 197 | 1 | " | 0 | 38,10 | 38 | 5,171 | |
| 32 | 123 | 1 | " | 0 | 34,39 | 34 | 3,577 | |
| 33 | 36 | 4 | " | 0 | 15,80 | 16 | 2,278 | |
| 34 | 103 | 7 | " | 0 | 40,97 | 41 | 2,514 | |
| 35 | 142 | 16 | " | 0 | 77,09 | 77 | 1,842 | |
| 36 | 24 | 4 | " | 0 | 9,79 | 10 | 2,451 | |
| 37 | 7 | 5 | " | 0 | 79,74 | 80 | 0,088 | |
| 38 | 395 | 31 | " | 0 | 94,00 | 94 | 4,202 | |
| 39 | 35 | 2 | " | 0 | 70,03 | 70 | 0,500 | |
| 40 | 210 | 4 | " | 0 | 47,38 | 47 | 4,432 | |
| 41 | 5 | 3 | " | 0 | 34,32 | 34 | 0,146 | |
| 42 | 17 | 1 | " | 0 | 5,16 | 5 | 3,295 | |
| 43 | 4 | 1 | " | 0 | 34,17 | 34 | 0,117 | |
| 44 | 98 | 7 | " | 0 | 23,33 | 23 | 4,201 | |
| 45 | 11 | 3 | " | 0 | 19,74 | 20 | 0,557 | |
| 46 | 2 | 4 | " | 0 | 86,98 | 87 | 0,023 | |
| 47 | 32 | 2 | " | 0 | 48,93 | 49 | 0,654 | |
| 48 | 244 | 15 | " | 0 | 125,74 | 126 | 1,941 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 49 | 79 | 8 | " | 0 | 50,61 | 51 | 1,561 | |
| 50 | 4 | 0 | " | 0 | 175,26 | 175 | 0,023 | |
| 51 | 17 | 0 | " | 0 | 9,98 | 10 | 1,703 | |
| 52 | 3 | 0 | 231 | 0 | 18,60 | 19 | 0,161 | |
| 53 | 3 | 2 | " | 0 | 9,87 | 10 | 0,304 | |
| 54 | 15 | 5 | " | 0 | 86,29 | 86 | 0,174 | |
| 55 | 363 | 15 | " | 0 | 133,74 | 134 | 2,714 | |
| 56 | 155 | 11 | " | 0 | 54,52 | 55 | 2,843 | |
| 57 | 183 | 15 | " | 0 | 116,90 | 117 | 1,565 | |
| 58 | 92 | 10 | " | 0 | 36,84 | 37 | 2,497 | |
| 59 | 341 | 10 | 132 | 0 | 66,32 | 66 | 5,142 | |
| 60 | 382 | 14 | 132 | 0 | 80,92 | 81 | 4,721 | |
| 61 | 761 | 54 | 222 | 0 | 67,17 | 67 | 11,329 | |
| Total | 7528 | 426 | 2353 | 371 | 3799,40 | - | 2,157 | |
| | | | | | | | | |
| Jebel Merah N | 312 | 7 | 102 | 36 | 49,86 | 50 | 6,980 | *Satellite* |
| Jebel Merah Total | 545 | 9 | - | 197 | 104,20 | 104 | 7,121 | *studies* |
| | | | | | | | | |
| a | 162 | 0 | - | 0 | 34,72 | 35 | 4,666 | |
| b | 25 | 0 | - | 0 | 7,27 | 7 | 3,439 | |
| | | | | | | | | |
| *Areas calculated using http://www.daftlogic.com/projects-google-maps-area-calculator-tool.htm* | | | | | | | | |

## TIERS OF TUMULUS DENSITY (for Figure 4.29)

| Tumuli/km$^2$ | Tier level | Colour |
|---|---|---|
| 0.0 - 0.2 | 1 | |
| 0.2 - 1.0 | 2 | |
| 1.0 - 2.0 | 3 | |
| 2.0 - 3.0 | 4 | |
| 3.0 - 4.5 | 5 | |
| 4.5 - 6.0 | 6 | |
| 6.0 - 7.5 | 7 | |
| Over 7.5 | 8 | |

**PALMYRENE KITES (numbers refer to GE survey ID and not reproduced here)**

| Palmyrena | Type | Max size | Direction | Other | Area |
|---|---|---|---|---|---|
| 1 | 4A | 50x45 | W | diffuse | 16 |
| 2 | 3A | 70x80 | NW | Kite 2011 | 3 |
| 3 | 3A | 60x49 | E | | 16 |
| 4 | 2C | 59x 42 | NW | | 21 |
| 5 | 3E | 100x50 | SE | | 21 |
| 6 | 1B | 75x58 | SE | | 21 |
| 7 | 1B | 58x50 | NW | | 21 |
| 8 | 3A | 100x98 | SE | cut by wadi | 21 |
| 9 | 3A | 50x48 | SW | | 21 |
| 10 | 2B | 72x60 | NE | hexagon | 21 |
| 11 | 1B | 65x40 | SE | large cairn on antennae/cut by wadi | 21 |
| 12 | 3B | 55x23 | S | | 21 |
| 13 | 2C? | 48x ? | SE | | 21 |
| 14 | 3A | 65x65 | SE | edged by wadi | 21 |
| 15 | 1A | 70x68 | NW | | 21 |
| 16 | 2A | 83x54 | NW | | 21 |
| 17 | 5B | 52x30 | SE | | 15 |
| 18 | 4D | 50x42 | E | annex in N (thus 50x58 m) | 15 |
| 19 | 1B | 87x76 | SE | diffuse | 1 |
| 20 | 2D | 60x47 | SE | | 3 |
| 21 | 1B | 68x60 | SE | | 21 |
| 22 | 1B | 89x75 | SE | | 21 |
| 23 | 2C | 68x53 | SE | | 21 |
| 24 | 2C | 86x75 | SE | 2C/3A-mix | 21 |
| 25 | 1B | 135x75 | SE | | 21 |
| 26 | 1B | 89x77 | NW | | 21 |
| 27 | 3A | 125x100 | SE | | 21 |
| 28 | 3A | 90x80 | SE | | 21 |
| 29 | 1B | 79x68 | W | | 21 |
| 30 | 3A | 86x60 | SE | | 21 |
| 31 | 3A | 100x86 | SW | cut by wadi | 21 |
| 32 | 5A | 115x81 | SE | diffuse E-edge | 21 |
| 33 | 3A | 82x71 | W | | 21 |
| 34 | 1B | 55x45 | NW | diffuse | 19 |
| 35 | 4E | 82x75 | SE | | 28 |
| 36 | 1B | 96x87 | SE | edged by wadi | 33 |
| 37 | 1B | 71x60 | E | | 33 |
| 38 | 3A | 95x95 | SE | borders 39 | 33 |
| 39 | 3D | 74x62 | SE | annexes in SW and NW (thus 105x95 m), which borders 38 | 33 |
| 40 | 4D | 97x62 | SE | | 32 |
| 41 | unknown | unknown | SW | only antennae | 31 |
| 42 | 5A | 65x49 | S | | 40 |

| | | | | | |
|---|---|---|---|---|---|
| 43 | 3A | 60x52 | W | | 40 |
| 44 | 3B | 50x35 | S | | 40 |
| 45 | 3A | 84x64 | S | | 40 |
| 46 | 2D | 85x62 | SE | curvilinear | 38 |
| 47 | 4E | 115x95 | SE | | 38 |
| 48 | 1B | 85x71 | SE | | 38 |
| 49 | 3A | 60x60 | SE | | 38 |
| 50 | 3A | 77x79 | E | | 39 |
| 51 | 3B | 87x64 | S | | 39 |
| 52 | 3A | 124x109 | S | | 42 |
| 53 | 4A | 97x77 | SE | | 38 |
| 54 | 3A | 108x95 | SE | | 38 |
| 55 | 3A | 81x32 | E | edge/eroded | 38 |
| 56 | 3A | 77x52 | SE | | 38 |
| 57 | 3A | 105x95 | NW | | 38 |
| 58 | 3A | 98x63 | NW | | 38 |
| 59 | 2C | 87x86 | SE | | 38 |
| 60 | 1B | 73x53 | SE | | 38 |
| 61 | 3A | 54x35 | SE | diffuse | 38 |
| 62 | 4E | 130x51 | SE | | 38 |
| 63 | 3A | 82x74 | SE | | 38 |
| 64 | 3A | 46x43 | SE | | 38 |
| 65 | 3B | 104x68 | S | | 38 |
| 66 | 1B | 83x50 | SE | | 38 |
| 67 | 4D | 78x72 | NW | | 38 |
| 68 | 3A | 89x79 | W | | 38 |
| 69 | 1B | 71x53 | W | | 38 |
| 70 | unknown | unknown | S | diffuse/eroded | 38 |
| 71 | 3C | 92x78 | SE | | 38 |
| 72 | unknown | unknown | SE | eroded by wadi | 38 |
| 73 | 3E | 83x57 | W | | 38 |
| 74 | 1A | 151x145 | SE | | 38 |
| 75 | 4D | 55x55 | N | | 38 |
| 76 | 3E | 58x36 | W | | 38 |
| 77 | 4B | 87x76 | E | hexagon | 38 |
| 78 | 4B | 83x80 | SE | pentagon | 38 |
| 79 | 4E | 108x63 | SE | | 37 |
| 80 | 4D | 97x81 | NW | curvilinear | 37 |
| 81 | 1B | 91x66 | E | | 37 |
| 82 | 3D | 101x75 | SE | | 37 |
| 83 | 2C | 80x63 | SE | diffuse | 37 |
| 84 | 3D | 75x61 | S | | 43 |
| 85 | 3D | 103x80 | S | | 41 |
| 86 | 3A | 115x87 | SE | | 41 |
| 87 | 4D | 47x35 | NW | obscure antennae | 41 |
| 88 | 4D | 41x39 | SE | | 45 |
| 89 | 3A | 84x67 | SE | | 45 |
| 90 | 3B | 61x43 | S | | 45 |
| 91 | 3D | 77x40 | SE | cut by road | 44 |

| | | | | | |
|---|---|---|---|---|---|
| 92 | 4B | 63x62 | S | diffuse | 44 |
| 93 | 5B | 81x82 | SE | | 26 |
| 94 | 1B | 67x34 | SE | edged by road | 44 |
| 95 | 3B | 92x65 | S | | 44 |
| 96 | 4E | 84x70 | S | | 44 |
| 97 | 3A | 65x60 | NE | | 44 |
| 98 | 3C | 65x60 | SE | obscure antennae | 44 |
| 99 | 3B | 191x98 | NW | | 7 |
| 100 | 3A | 78x70 | NW | | 38 |
| **Palmyra** | **Type** | **Max size** | **Direction** | **Other** | **Area** |
| 1 | 4B | 93x76 | E | | 14 |
| 2 | 3D | 76x60 | E | | 14 |
| 3 | 4B | 57x54 | E | | 14 |
| 4 | 2C | 70x61 | E | | 14 |
| 5 | 3A | 51x49 | E | | 14 |
| 6 | 4B | 68x49 | E | pentagon | 14 |
| 7 | 4B | 50x50 | NE | | 14 |
| 8 | 1B | 57x51 | E | | 14 |
| 9 | 1B | 96x64 | E | | 14 |
| 10 | 4B | 95x76 | SE | | 14 |
| 11 | 1B | 70x59 | NE | | 23 |
| 12 | 1B | 64x50 | E | | 23 |
| 13 | 3A | 79x62 | NW | | 23 |
| 14 | 1B | 49x37 | E | | 23 |
| 15 | 2A | 54x37 | NW | | 23 |
| 16 | 1B | 61x32 | SE | | 23 |
| 17 | 2A | 48x38 | NW | | 23 |
| 18 | unknown | unknown | NE | eroded/destroyed | 23 |
| 19 | 3A | 62x52 | W | | 23 |
| 20 | 1B | 93x50 | SW | | 23 |
| 21 | 3A | 54x52 | NE | | 23 |
| 22 | 2C | 52x49 | NE | | 23 |
| 23 | 3D | 69x62 | E | remains of extra distal wall (52x62) | 23 |
| 24 | 3A | 68x61 | SW | | 23 |
| 25 | 5A | 84x52 | NW | | 23 |
| 26 | 1B | 79x70 | NW | | 23 |
| 27 | 1B | 58x53 | SE | annex in NE (thus 87x53) | 23 |
| 28 | 1B | 96x79 | E | | 23 |
| 29 | 1B | 91x80 | NE | | 23 |
| 30 | 1B | 90x76 | NW | | 23 |
| 31 | 4D | 50x41 | W/E | antennae on two sides | 23 |
| 32 | 1B | 47x40 | E | | 23 |
| 33 | 4A | 55x49 | S | | 23 |
| 34 | 2B | 75x67 | SE | | 23 |
| 35 | 1B | 75x55 | N | | 23 |
| 36 | 2B | 42x42 | S | large cairn in inlet | 23 |
| 37 | 1B | 82x54 | NW | | 23 |
| 38 | 2B | 86x43 | NE | | 23 |
| 39 | 4B | 72x63 | NW | | 23 |

| | | | | | |
|---|---|---|---|---|---|
| 40 | 4E | 58x56 | NE | enclosures on NW edge | 23 |
| 41 | 4B | 72x55 | W | large cairn on antennae | 23 |
| 42 | 3B | 78x58 | S | | 23 |
| 43 | 3C | 140x60 | E | cut by road | 23 |
| 44 | 3A | 47x44 | NW | 44/45 poss. one | 23 |
| 45 | 3A | 67x66 | NW | 44/45 poss. one | 23 |
| 46 | unknown | unknown | NW | diffuse/eroded | 23 |
| 47 | 4B? | 78x51 | NW | diffuse | 23 |
| 48 | 3A | 68x70 | SW | | 23 |
| 49 | 4B | 53x39 | SW | hexagon | 23 |
| 50 | 1B | 79x73 | E | | 23 |
| 51 | unknown | unknown | E | diffuse/eroded | 23 |
| 52 | 4D | 51x35 | SW | | 23 |
| 53 | 3D | 73x67 | E | | 23 |
| 54 | 4D | 52x38 | E | | 23 |
| 55 | 1B | 62x54 | SW | | 23 |
| 56 | 4E | 87x66 | NW | | 23 |
| 57 | 3A | 62x60 | W | obscure antennae | 23 |
| 58 | 5B | 81x73 | SE | | 23 |
| 59 | 3A | 52x47 | SW | | 23 |
| 60 | 1B | 71x57 | E | | 23 |
| 61 | 1B | 70x57 | S | | 23 |
| 62 | 1B | 71x60 | NE | | 23 |
| 63 | 1B | 61x59 | SW | | 23 |
| 64 | 3A | 56x53 | SE | mesa used as trap | 23 |
| 65 | 3A | 75x70 | SE | | 23 |
| 66 | 4B | 48x46 | W | diffuse/sharp turn | 23 |
| 67 | 4D | 48x45 | W | diffuse | 23 |
| 68 | 1B | 63x57 | SE | | 23 |
| 69 | 1B | 80x77 | W | | 23 |
| 70 | 2A | 67x43 | SW | | 23 |
| 71 | 1B | 76x63 | E | | 23 |
| 72 | 3A | 72x61 | W | | 23 |
| 73 | 3A | 67x66 | N | mesa used as trap/cairn in middle of trap | 23 |
| 74 | 2B | 80x55 | SE | antennae cut by buildings | 23 |
| 75 | 1B | 99x60 | W | edged by wadi | 23 |
| 76 | 3B | 59x45 | S | | 23 |
| 77 | 3A | 49x44 | NW | | 23 |
| 78 | 1B | 95x67 | NW | | 23 |
| 79 | 1B | 58x43 | SE | | 23 |
| 80 | 3A | 72x57 | SE | | 23 |
| 81 | 4B | 60x47 | SE | | 23 |
| 82 | 3A | 68x66 | NW | | 23 |
| 83 | 3A? | 81x60 | SE | diffuse | 22 |
| 84 | 3A | 86x64 | W | | 22 |
| 85 | 1B | 85x72 | W | | 23 |
| 86 | 5B | 116x53 | W | | 23 |
| 87 | 3A | 61x60 | E | antennae cut by road | 14 |

| | | | | | |
|---|---|---|---|---|---|
| 88 | 2C | 56x54 | E | | 14 |
| 89 | 4D | 68x46 | NW | curvilinear | 14 |
| 90 | 4E | 64x58 | SW | | 14 |
| 91 | 2A | 62x59 | N | obscure antennae | 14 |
| 92 | 4B | 77x75 | S | | 14 |
| 93 | 4D | 59x59 | E | curvilinear | 14 |
| 94 | 1B | 43x41 | S | | 14 |
| 95 | 3C | 63x58 | NW | diffuse | 23 |
| 96 | 2B | 63x45 | W | | 23 |
| 97 | 1B | 88x85 | E | irregular | 23 |
| 98 | 3C | 57x47 | W | | 23 |
| 99 | 4B | 51x43 | N | pentagon | 23 |
| 100 | 3C | 59x31 | E | | 23 |
| 101 | 3A | 72x53 | NE | | 23 |
| 102 | 4D | 69x33 | W | diffuse | 23 |
| 103 | 3A | 56x55 | SW | | 23 |
| 104 | 4D | 62x42 | SW | curvilinear | 23 |
| 105 | 2C | 47x28 | SE | | 26 |
| 106 | 2C | 47x42 | E | | 26 |
| 107 | 4B | 48x43 | N | pentagon | 26 |
| 108 | 4B | 79x69 | S | pentagon | 26 |
| 109 | 2B | 57x49 | E | | 26 |
| 110 | 3A | 37x32 | S | | 26 |
| 111 | 1B | 42x40 | SE | diffuse | 26 |
| 112 | 3A | 58x55 | SW | | 26 |
| 113 | 4E | 128x115 | S | | 26 |
| 114 | 3A | 91x70 | S | | 26 |
| 115 | 1B | 71x60 | SE | | 26 |
| 116 | 3A | 90x61 | E | | 26 |
| 117 | 4D | 60x37 | E | | 23 |
| 118 | 1B | 125x76 | E | | 23 |
| 119 | 4E | 92x71 | S | | 26 |
| 120 | 4A | 112x113 | E | | 26 |
| 121 | 1B | 68x55 | SE | | 26 |
| 122 | 4B | 84x56 | SE | pentagon | 26 |
| 123 | unknown | unknown | NW | eroded by wadi/cairn on antennae | 26 |
| 124 | unknown | unknown | E | cliff edge as trap | 26 |
| 125 | 4C | 131x82 | SE | | 26 |
| 126 | 3A | 40x37 | SE | | 26 |
| 127 | 3A | 68x56 | NW | diffuse | 35 |
| 128 | 4B | 61x51 | NW | pentagon | 35 |
| 129 | 2C | 70x67 | SE | | 35 |
| 130 | 5B | 220x134 | SE | irregular shape, mix of 1A/5B/border on 131 | 35 |
| 131 | 3A | 108x89 | SE | curvilinear/border on 130 (older?) | 35 |
| 132 | 1B | 64x60 | S | | 35 |
| 133 | unknown | unknown | NW | eroded or cliff trap | 35 |
| 134 | 1B | 68x64 | SE | | 35 |
| 135 | 1B | 112x70 | E | | 35 |

| | | | | | |
|---|---|---|---|---|---|
| 136 | 2C | 117x83 | SE | | 35 |
| 137 | 2D | 85x70 | SE | | 35 |
| 138 | 2C | 65x60 | SE | obscure antennae | 35 |
| 139 | 4D | 62x40 | NW | | 35 |
| 140 | 2B | 193x66 | NE | diffuse/obscure antennae | 35 |
| 141 | 3A | 66x45 | E | | 35 |
| 142 | 1B | 116x88 | SE | | 34 |
| 143 | 2A | 76x47 | SE | | 35 |
| 144 | 1B | 72x66 | NW | | 36 |
| 145 | 3A | 100x88 | SE | | 34 |
| 146 | 3A | 118x95 | S | internal wall division | 34 |
| 147 | 1B | 113x95 | NW | | 36 |
| 148 | 2C | 152x76 | S | | 36 |
| 149 | 3B | 105x81 | E | distal wall eroded | 36 |
| 150 | 3A | 70x65 | NW | diffuse | 24 |
| 151 | 1B | 114x107 | SW | | 34 |
| 152 | 2A | 61x58 | S | | 34 |
| 153 | 5B | 98x67 | E | | 34 |
| 154 | 2B | 94x90 | SE | | 34 |
| 155 | 3A | 50x40 | SE | | 25 |
| 156 | 3A | 65x59 | E | | 24 |
| 157 | 3A | 83x76 | NW | | 24 |
| 158 | 4B | 71x50 | E | pentagon | 14 |
| 159 | 4D | 44x28 | W | | 23 |
| 160 | 2D | 65x47 | NE | | 23 |
| 161 | 1B | 61x39 | NW | | 23 |
| **Soukhne** | **Type** | **Max size** | **Direction** | **Other** | **Area** |
| 1 | 3D | 55x46 | SE | | 54 |
| 2 | 3A | 88x100 | SE | | 54 |
| 3 | 3A | 102x108 | SE | | 54 |
| 4 | 3A | 102x116 | S | | 54 |
| 5 | Sock | 43x37 | SE | curved antennae | 55 |
| 6 | 3A | 98x85 | S | | 55 |
| 7 | 3A | 57x55 | NW | | 55 |
| 8 | 4E | 98x81 | S | | 55 |
| 9 | 3B | 67x110 | E | | 55 |
| 10 | 2C | 71x69 | SW | | 55 |
| 11 | Sock | 40x32 | S | curved antennae | 55 |
| 12 | 3A | 113x103 | SE | | 55 |
| 13 | 4D | 91x101 | SE | | 55 |
| 14 | unknown | unknown | NE | eroded | 55 |
| 15 | unknown | unknown | SE | eroded | 55 |
| 16 | unknown | unknown | SE | edge | 55 |
| 17 | 4D | 69x111 | SE | | 55 |
| 18 | 4B | 119x130 | SE | pentagon | 55 |
| 19 | 3B | 97x76 | S | | 57 |
| 20 | 2D | 72x57 | S | | 58 |
| 21 | 4D | 68x69 | S | | 58 |
| 22 | 3A | 103x77 | E | | 57 |

| | | | | | |
|---|---|---|---|---|---|
| 23 | 2D | 75x65 | S | | 57 |
| 24 | 3C | 60x53 | SE | | 57 |
| 25 | 4B | 62x67 | SE | | 57 |
| 26 | 3B | 58x44 | S | | 57 |
| 27 | 3A | 60x64 | SE | | 57 |
| 28 | 4B | 71x81 | SE | | 57 |
| 29 | Sock | 45x31 | SE | | 56 |
| 30 | 3A | 65x101 | S | | 56 |
| 31 | Sock | 30x23 | S | curved antennae | 56 |
| 32 | 4B | 67x84 | SE | | 56 |
| 33 | 3A | 97x78 | S | | 56 |
| 34 | 3A | 56x78 | SE | | 56 |
| 35 | 2D | 45x39 | S | | 56 |
| 36 | 3A | 78x103 | N | two traps in series | 56 |
| 37 | 4E | 64x67 | S | | 56 |
| 38 | 3A | 45x52 | SE | | 53 |
| 39 | 3B | 81x47 | S | | 53 |
| 40 | Sock | 33x27 | S | curved antennae | 58 |
| 41 | 2A | 56x54 | SE | | 58 |
| 42 | 3A | 53x47 | SE | | 58 |
| 43 | unknown | unknown | S | edge as trap | 58 |
| 44 | Sock | 38x35 | S | curved antennae | 58 |
| 45 | Sock | 29x35 | S | | 58 |
| 46 | 3A | 59x71 | SE | | 58 |
| 47 | unknown | 59x54 | S | diffuse | 58 |
| 48 | 3B | 63x65 | S | | 54 |
| 49 | 3C | 53x60 | S | | 57 |
| 50 | 4B | 42x59 | E | pentagon | 57 |
| 51 | Sock | 29x32 | SE | | 55 |
| 52 | 3C | 66x63 | SE | | 57 |
| 53 | 3A | 45x58 | NW | | 57 |
| 54 | 3B | 56x34 | S | | 56 |
| 55 | 3A | 55x51 | SE | | 56 |
| 56 | 3A | 54x66 | E | edged by wadi | 57 |
| 57 | 4B | 81x71 | SE | | 57 |
| 58 | unknown | 43x51 | W | diffuse trap | 57 |
| **Massive** | **Type** | **Max size** | **Direction** | **Other** | **Area** |
| 1 | 2A | 50x47 | W | | 59 |
| 2 | 3A | 68x70 | E | | 59 |
| 3 | 2A | 72x95 | NW | | 59 |
| 4 | 2C | 54x77 | SE | | 59 |
| 5 | 2D | 63x56 | N | eroded | 59 |
| 6 | 4D | 64x66 | SE | | 59 |
| 7 | 4A | 67x102 | SE | | 59 |
| 8 | 1A | 79x113 | E | valley as antennae | 59 |
| 9 | unknown | unknown | E | diffuse | 59 |
| 10 | 2D | 53x49 | S | | 59 |
| 11 | 4E | 52x41 | E | | 60 |
| 12 | 4D | 73x50 | SE | | 60 |

| | | | | | |
|---|---|---|---|---|---|
| 13 | 3C | 92x61 | NW | | 60 |
| 14 | 5A | 49x79 | NW | | 60 |
| 15 | 1B | 73x45 | N | | 60 |
| 16 | 3A | 69x71 | NW | | 60 |
| 17 | unknown | unknown | NW | diffuse | 60 |
| 18 | 3B | 67x50 | E | | 60 |
| 19 | 3A | 62x62 | E | | 60 |
| 20 | 3A | 57x69 | W | | 60 |
| 21 | 3A | 64x49 | S | | 60 |
| 22 | 3A | 78x100 | SE | | 60 |
| 23 | 3A | 48x58 | NW | | 60 |
| 24 | Sock | 55x75 | NW | | 60 |
| **Labidah** | **Type** | **Max size** | **Direction** | **Other** | **Area** |
| 1 | 4B | 77x70 | E | hexagon | 61 |
| 2 | 2C | 50x46 | SE | | 61 |
| 3 | 2D | 20x20 | SE | tiny trap | 61 |
| 4 | 3A | 59x64 | NW | | 61 |
| 5 | 3A | 35x48 | SE | | 61 |
| 6 | unknown | unknown | N | diffuse | 61 |
| 7 | unknown | unknown | NW | diffuse | 61 |
| 8 | 3A | 42x40 | S | | 61 |
| 9 | 3E | 26x17 | NE | diffuse | 61 |
| 10 | 3A | 26x28 | E | diffuse | 61 |
| 11 | 3A | 75x57 | S | | 61 |
| 12 | 4A | 53x63 | SE | | 61 |
| 13 | 3A | 105x63 | SE | | 61 |
| 14 | 2D | 78x108 | SE | | 61 |
| 15 | 4B | 52x68 | SE | | 61 |
| 16 | Sock | 59x36 | S | | 61 |
| 17 | 5A | 93x60 | SE | | 61 |
| 18 | Sock | 48x33 | SE | curved antennae | 61 |
| 19 | Sock | 33x21 | NW | curved antennae | 61 |
| 20 | 4B | 62x46 | SE | hexagon | 61 |
| 21 | 2D | 52x54 | SE | | 61 |
| 22 | 3A | 68x68 | E | | 61 |
| 23 | 3A | 48x50 | SE | | 61 |
| 24 | 3A | 65x55 | SE | diffuse | 61 |
| 25 | Sock | 33x27 | SE | | 61 |
| 26 | 3A | 83x57 | S | | 61 |
| 27 | 3A | 53x47 | S | | 61 |
| 28 | Sock | 27x30 | S | curved antennae | 61 |
| 29 | Sock | 29x27 | SE | | 61 |
| 30 | Sock | 25x17 | NW | diffuse | 61 |
| 31 | 2A | 49x51 | SE | | 61 |
| 32 | 3A | 85x76 | E | | 61 |
| 33 | 3A | 44x44 | SE | | 61 |
| 34 | 3A | 27x35 | NW | entrance crossing wadi | 61 |
| 35 | Sock | 29x36 | S | curved antennae | 61 |
| 36 | 3B | 75x70 | S | | 61 |

| | | | | | |
|---|---|---|---|---|---|
| 37 | 3A | 50x54 | SE | diffuse | 61 |
| 38 | 2A | 60x47 | NW | | 61 |
| 39 | 1B | 49x55 | NE | obscure antennae | 61 |
| 40 | 2D | 75x125 | SE | | 61 |
| 41 | 2C | 75x74 | E | diffuse | 61 |
| 42 | 1B | 103x74 | E | | 61 |
| 43 | 3A | 103x85 | W | partly eroded | 61 |
| 44 | 3A | 73x80 | W | partly eroded | 61 |
| 45 | 3A | 58x46 | SE | | 61 |
| 46 | 1B | 76x57 | S | | 61 |
| 47 | 2A | 39x39 | S | curved antennae | 61 |
| 48 | 3A | 54x56 | SE | | 61 |
| 49 | 5A | 32x67 | SE | irregular | 61 |
| 50 | 1B | 61x37 | SE | irregular | 61 |
| 51 | 4B | 54x55 | SE | | 61 |
| 52 | 1B | 90x51 | S | | 61 |
| 53 | Sock | 47x28 | SE | looks like 5B | 61 |
| 54 | unknown | unknown | E | eroded | 61 |
| **Eastern** | **Type** | **Max size** | **Direction** | **Other** | **Area** |
| 1 | 3A | 72x45 | SE | | 48 |
| 2 | 1B | 61x52 | W | | 48 |
| 3 | 3A | 75x70 | SE | | 48 |
| 4 | 3A | 73x55 | SE | | 48 |
| 5 | 1B | 62x45 | SE | | 48 |
| 6 | 3D | 75x55 | SE | | 48 |
| 7 | 3A | 94x65 | SE | | 48 |
| 8 | 3A | 60x62 | SE | | 48 |
| 9 | 4B | 65x73 | S | | 48 |
| 10 | 3A | 115x95 | SE | | 48 |
| 11 | unknown | (edge) | SE | | 48 |
| 12 | 4B | 90x85 | S | | 48 |
| 13 | unknown | unknown | unknown | | 48 |
| 14 | 4A | 70x50 | S | pentagon | 48 |
| 15 | 3A | 105x115 | N | | 48 |
| **Desert** | **Type** | **Max size** | **Direction** | **Other** | **Area** |
| 1 | 2B | 125x93 | S | | 49 |
| 2 | unknown | unknown | SE | eroded | 49 |
| 3 | 4B | 56x48 | S | pentagon | 49 |
| 4 | 3D | 115x95 | S | | 49 |
| 5 | 3A | 96x84 | S | | 49 |
| 6 | 3A | 105x97 | NE | under no. 5 | 49 |
| 7 | unknown | unknown | N | eroded | 49 |
| 8 | 3A | 48x47 | S | | 49 |
| 9 | 2A | 53x44 | S | sharp turn into trap | 46 |
| 10 | 2B | 100x65 | S | | 47 |
| 11 | 4B | 130x105 | SE | pentagon | 47 |
| 12 | 3A | 70x65 | S | obscure antennae | 46 |
| 13 | 3A | 77x68 | S | annex in N (thus 100x68) | 46 |
| 14 | 3A | 62x60 | NW/SE | obscure antennae | 46 |

**Directions:**

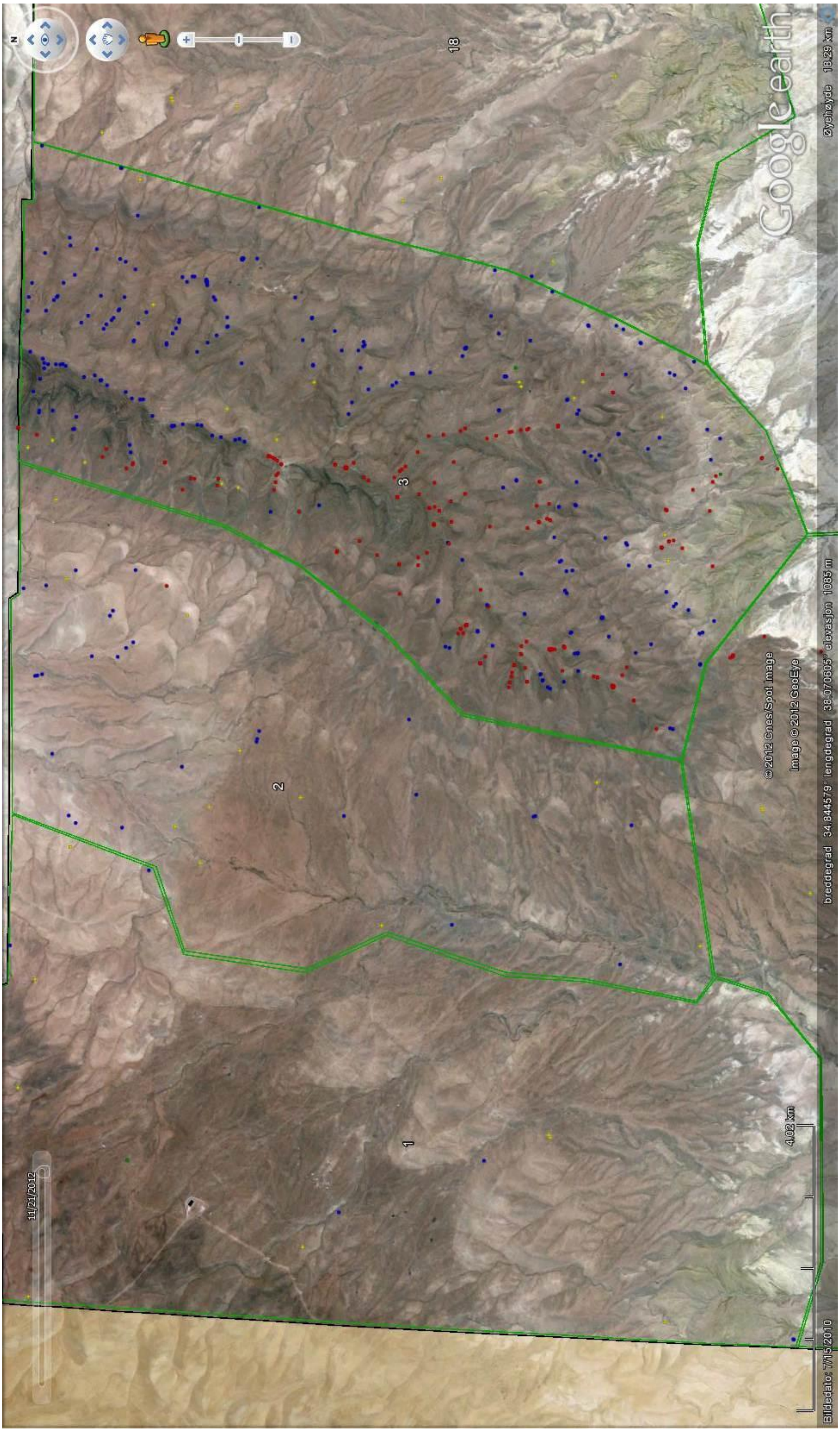
| | | |
|---|---|---|
| E | 62 | 15 % |
| SE | 149 | 35 % |
| S | 78 | 18 % |
| SW | 18 | 4 % |
| W | 29 | 7 % |
| NW | 57 | 13 % |
| N | 12 | 3 % |
| NE | 18 | 4 % |
| unknown | 1 | 0 % |
| NW/SE | 1 | 0 % |
| W/E | 1 | 0 % |
| Total | 426 | 100 % |

**Types:**

| | |
|---|---|
| 1A | 3 |
| 1B | 69 |
| 2A | 15 |
| 2B | 11 |
| 2C | 18 |
| 2D | 13 |
| 3A | 121 |
| 3B | 18 |
| 3C | 10 |
| 3D | 11 |
| 3E | 4 |
| 4A | 6 |
| 4B | 34 |
| 4C | 1 |
| 4D | 23 |
| 4E | 13 |
| 5A | 6 |
| 5B | 6 |
| 2C? | 1 |
| 3A? | 1 |
| Sock | 18 |
| unknown | 24 |
| Total | 426 |

## 8.4 Appendix 4: Area maps and Palmyrene structures

| **Page** | **Area names** | **Area no.** |
|---|---|---|
| III | Jebel Shaar / Wadi Khabar / Jebel Merah | 1 / 2 / 3 |
| IV | Wadi Massadeh | 4 |
| V | Jebel Abyad W | 5 |
| VI | Al Matna | 6 |
| VII | Jebel Abyad E / Wadi Takara | 7 / 9 |
| VIII | Jazal / Jebel Homr ej Jazal | 8 / 10 |
| IX | Al Diwa | 11 |
| X | Western Palmyra | 12 |
| XI | Tulul Rwaissate / Jebel Haiyane | 13 / 14 |
| XII | Jebel Tar en Nuwaysir | 15 |
| XIII | Jebel Marbat el Hassane | 16 |
| XIV | Wadi Abyad | 17 |
| XV | Wadi Rahawi | 18 |
| XVI | Jebel Abu Rujmein | 19 |
| XVII | Duhur Nuqur el Habiye | 20 |
| XVIII | Jebel Safra / Dahr el Qettar | 21 / 22 |
| XIX | Jebel Mohamed ibn Ali | 23 |
| XX | Palmyra / Bir Mounsef | 24 / 25 |
| XXI | Jebel Duwara | 26 |
| XXII | Dahr el Moussoum | 27 |



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2
1
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Image © 2012 GeoEye
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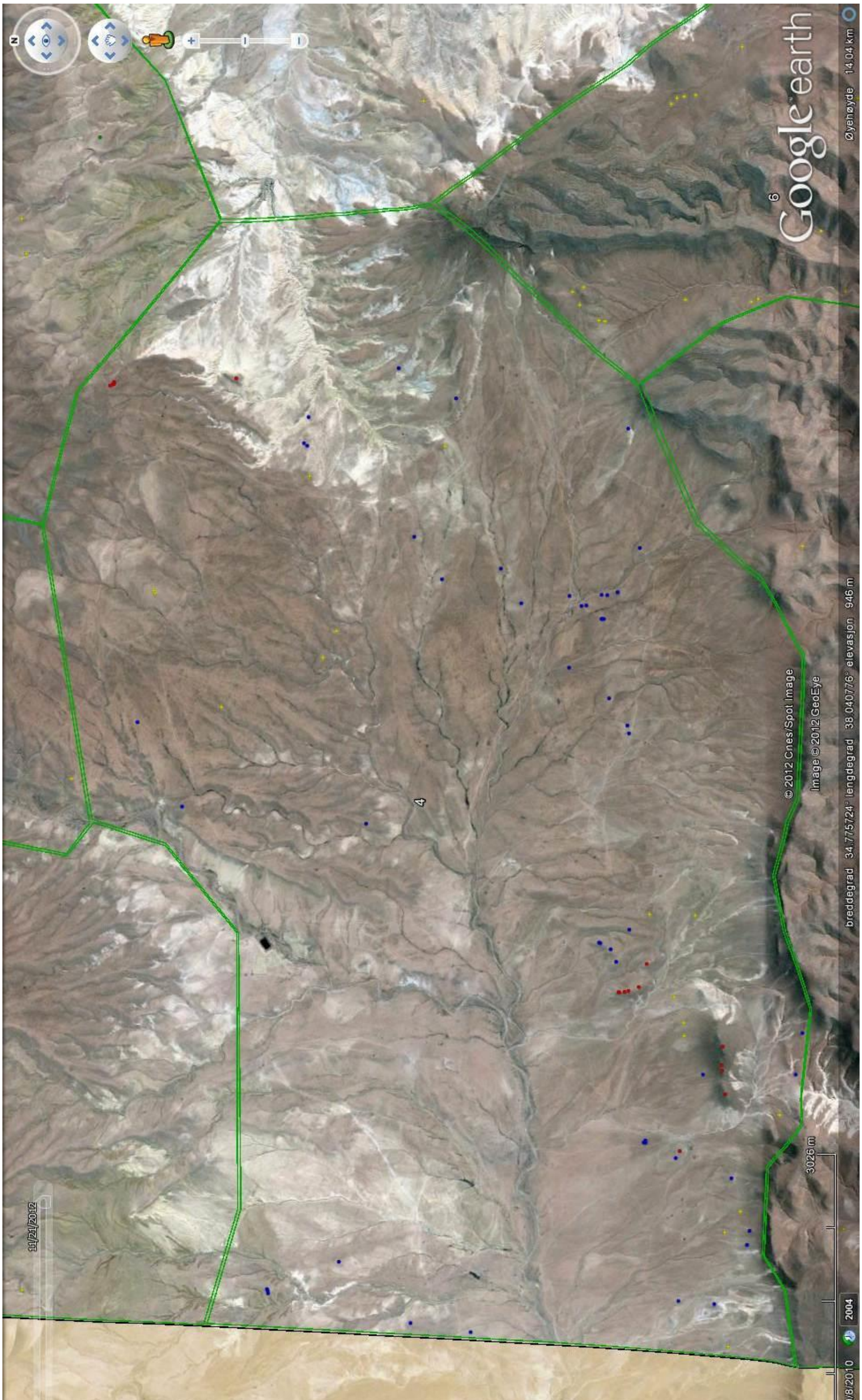
4.02 km
11/21/2012
Bildedato: 7/15/2010



Google earth
© 2012 Cnes/Spot Image
Image © 2012 GeoEye
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3026 m
2004
Bildedato: 9/8/2010
11/21/2012

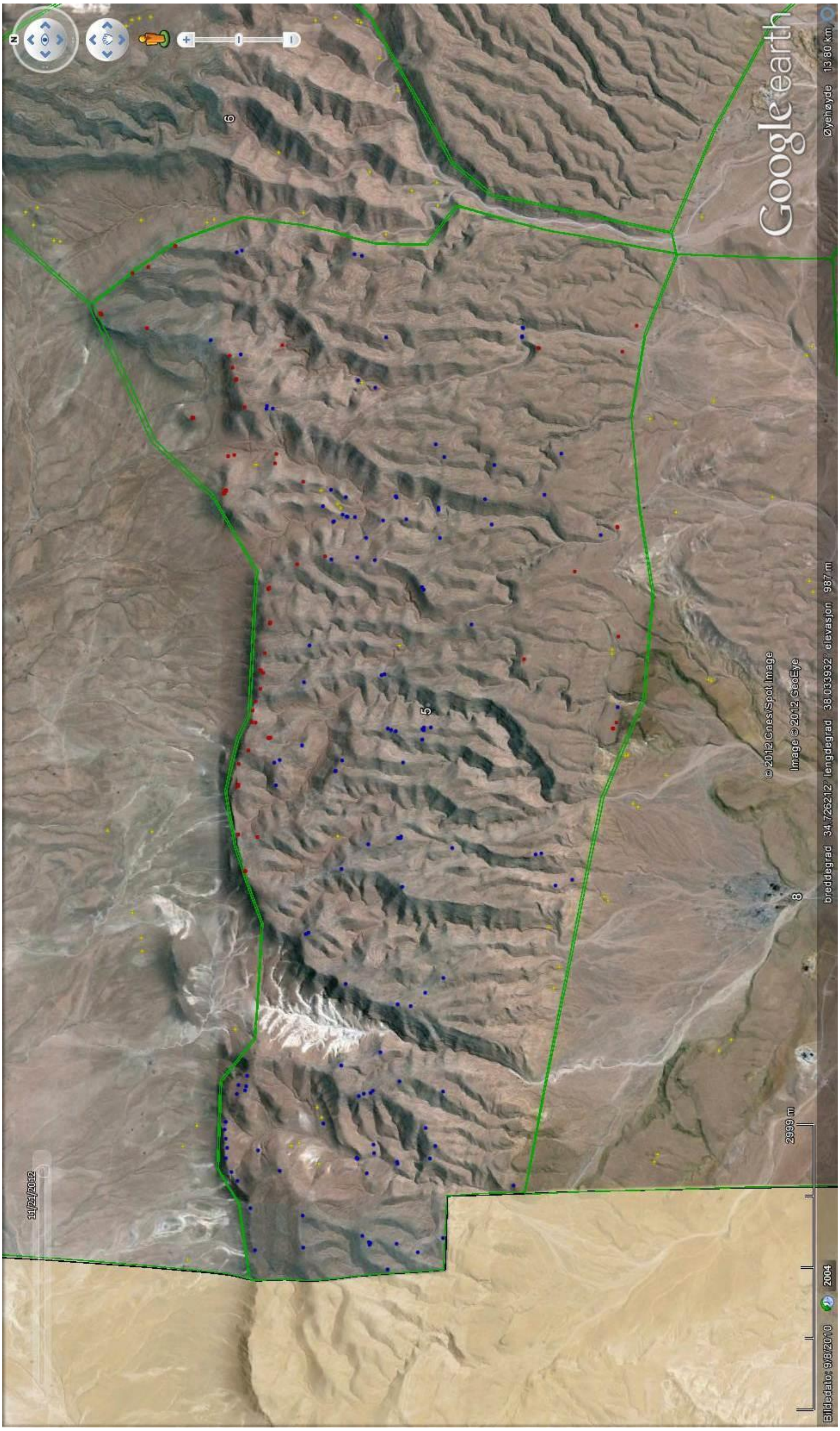

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Image © 2012 GeoEye
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Google earth
2999 m
Bildedato: 9/8/2010
2004
11/21/2012

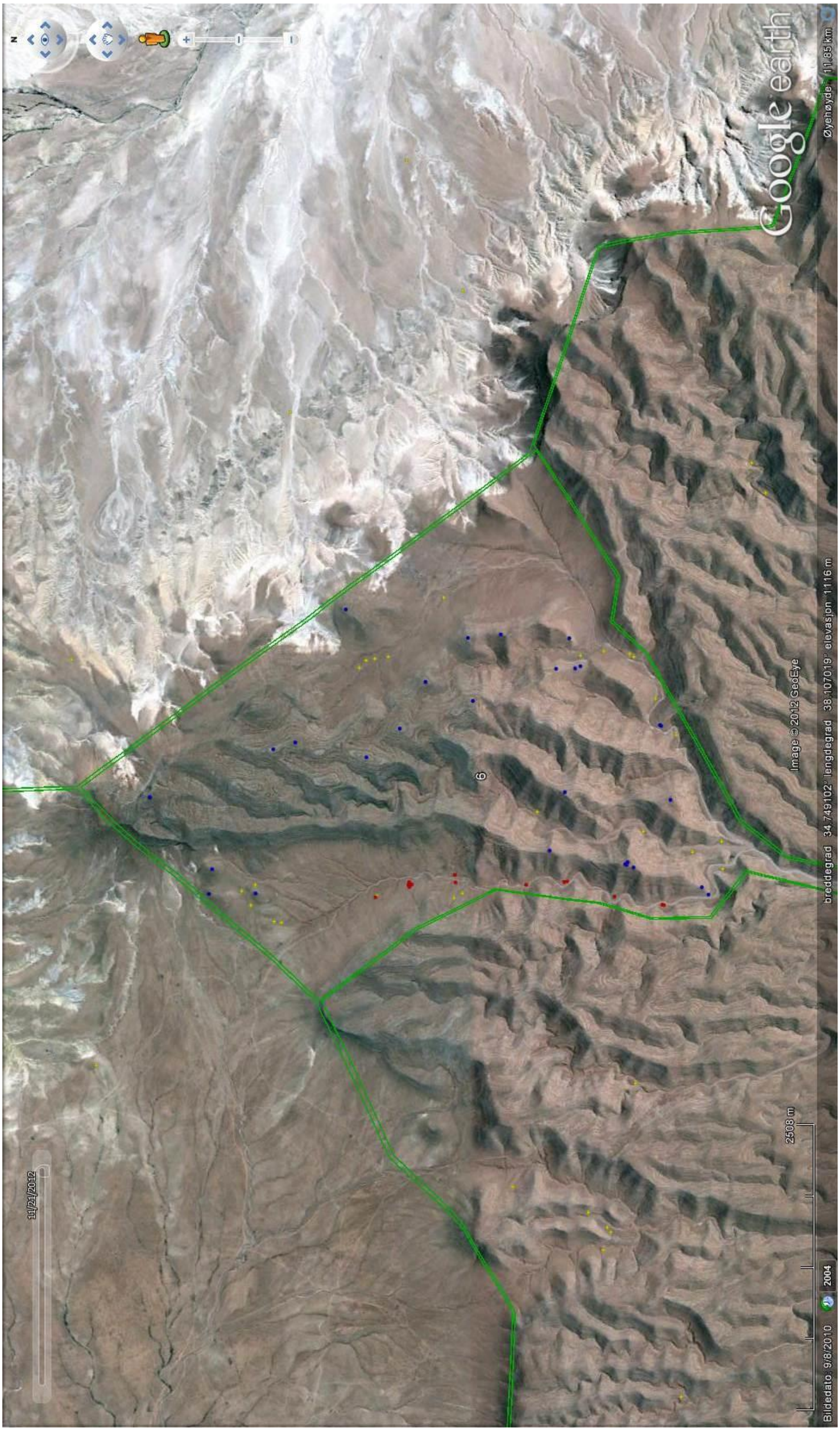
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Image © 2012 GeoEye
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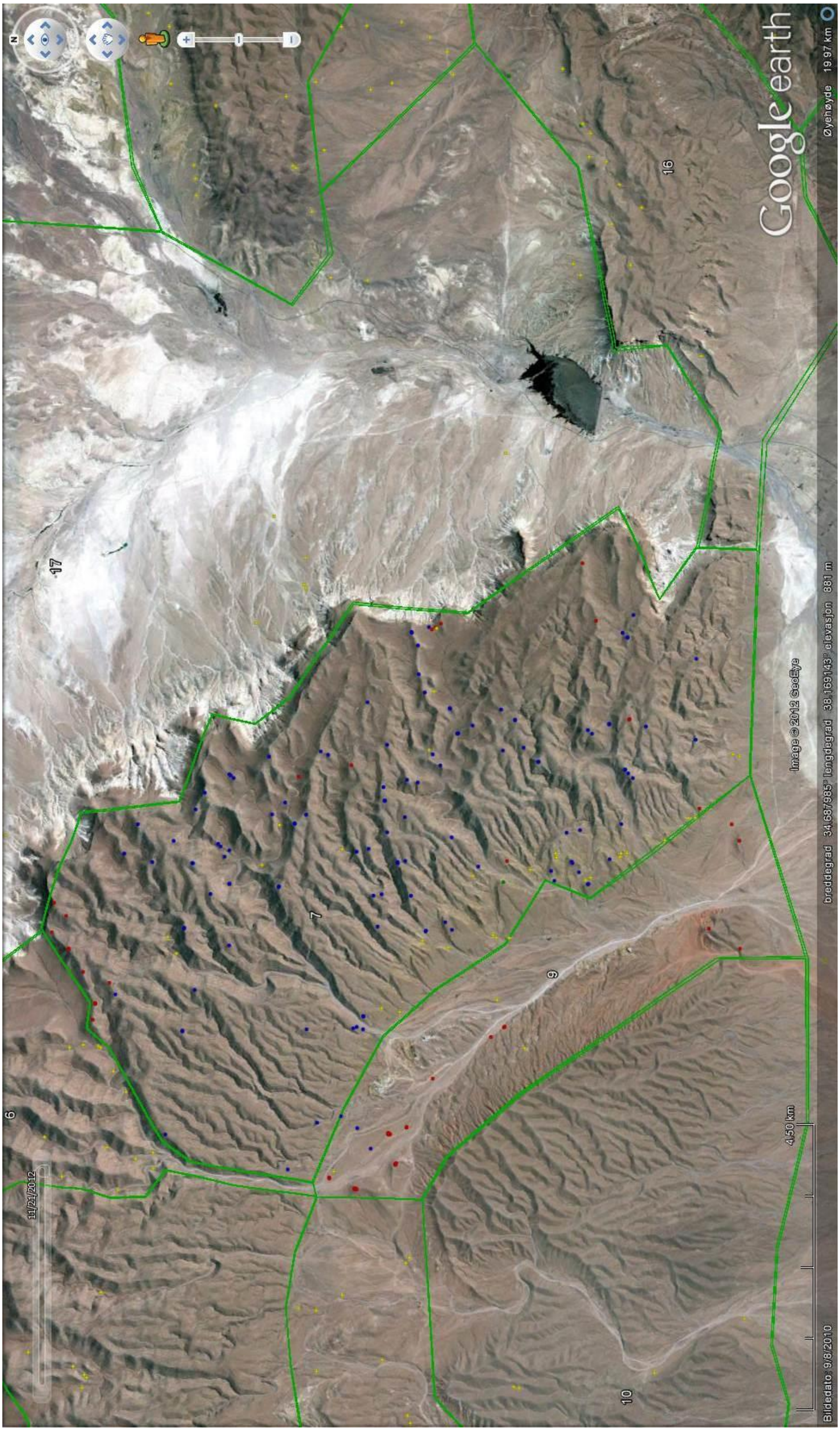
2004
11/21/2012
2508 m
6


17
16
7
9
6
10
4.50 km
11/21/2012
Image © 2012 GeoEye
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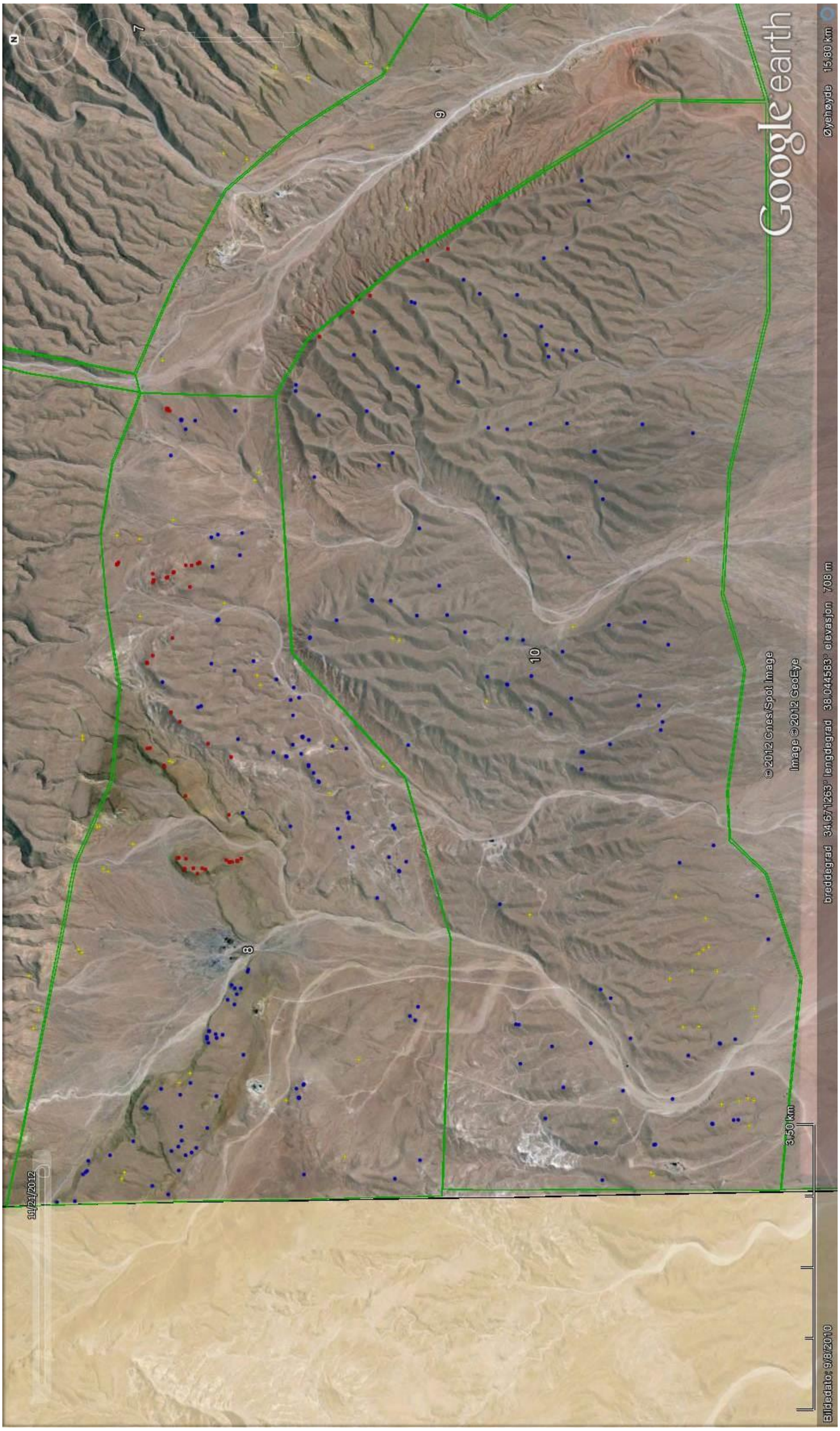
Google earth



7
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8
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Google earth
© 2012 Cnes/Spot Image
Image © 2012 GeoEye
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Øyenøyde 15.80 km
3.50 km
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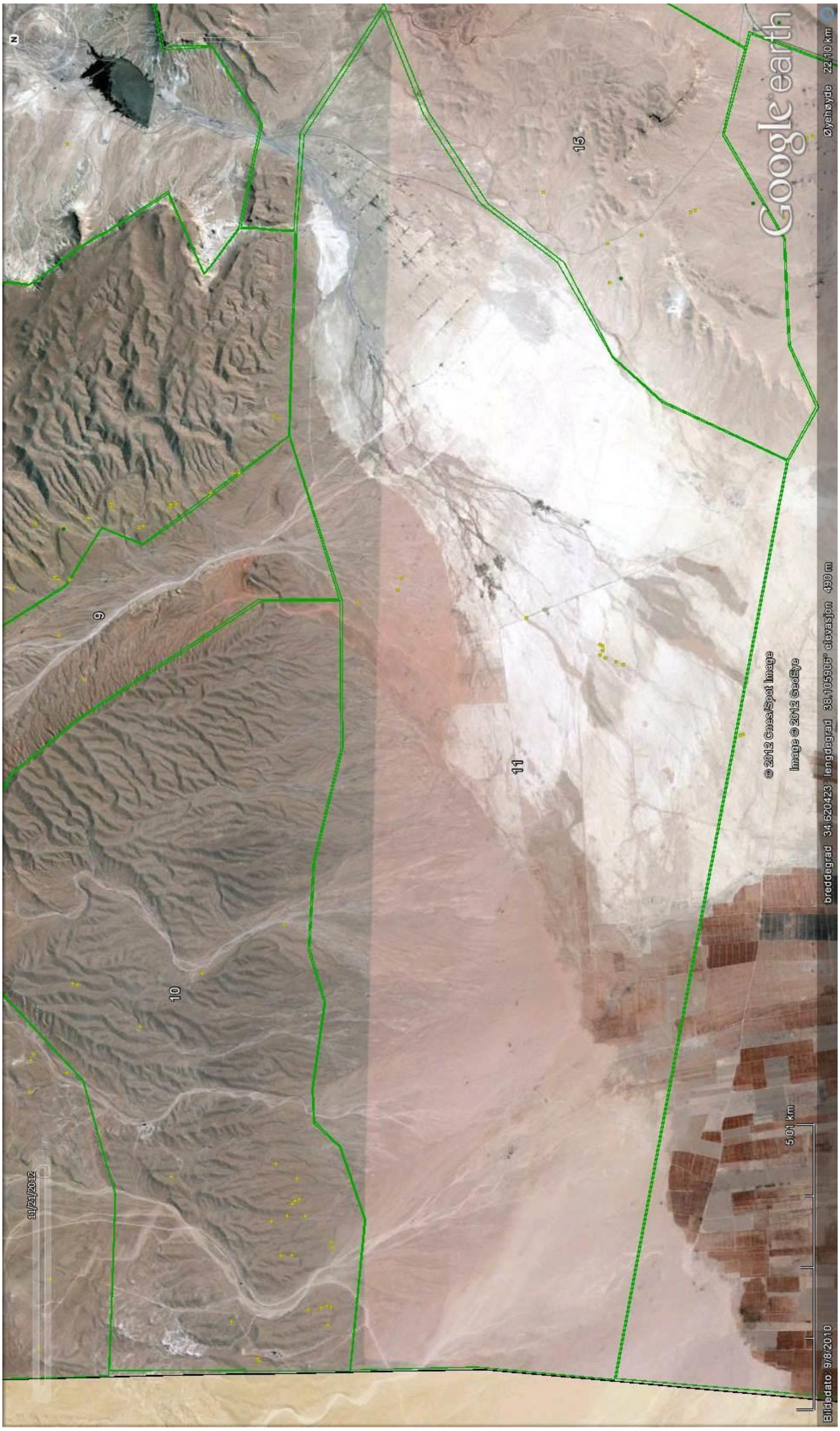
11/21/2012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11
10
© 2012 Cnes/Spot Image
Image © 2012 GeoEye
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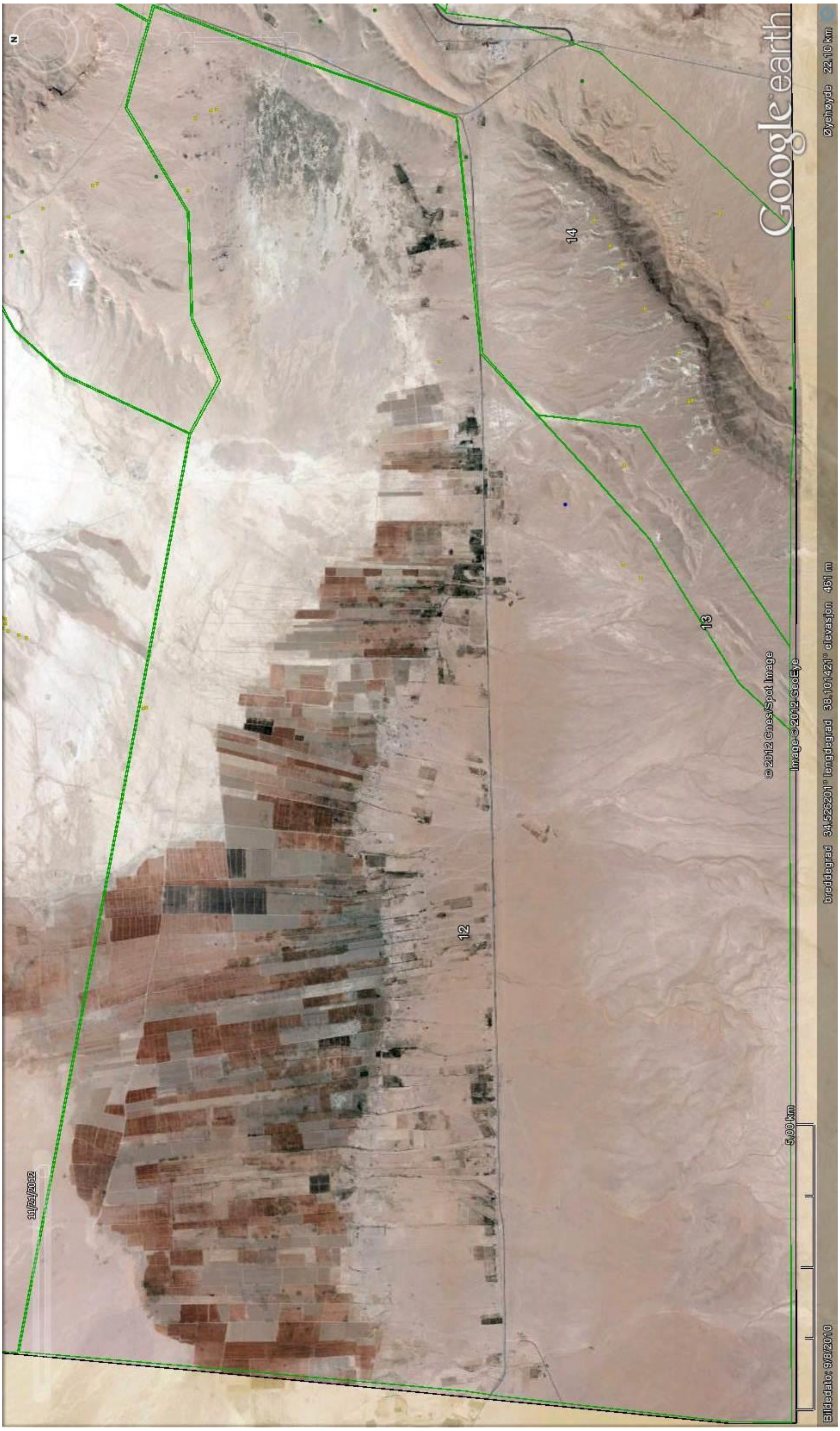
5.01 km
11/21/2012
Google earth


14
13
12
© 2012 Cnes/Spot Image
Image © 2012 GeoEye
Google earth
5,00 km
11/21/2012
Bildedato: 9/8/2010
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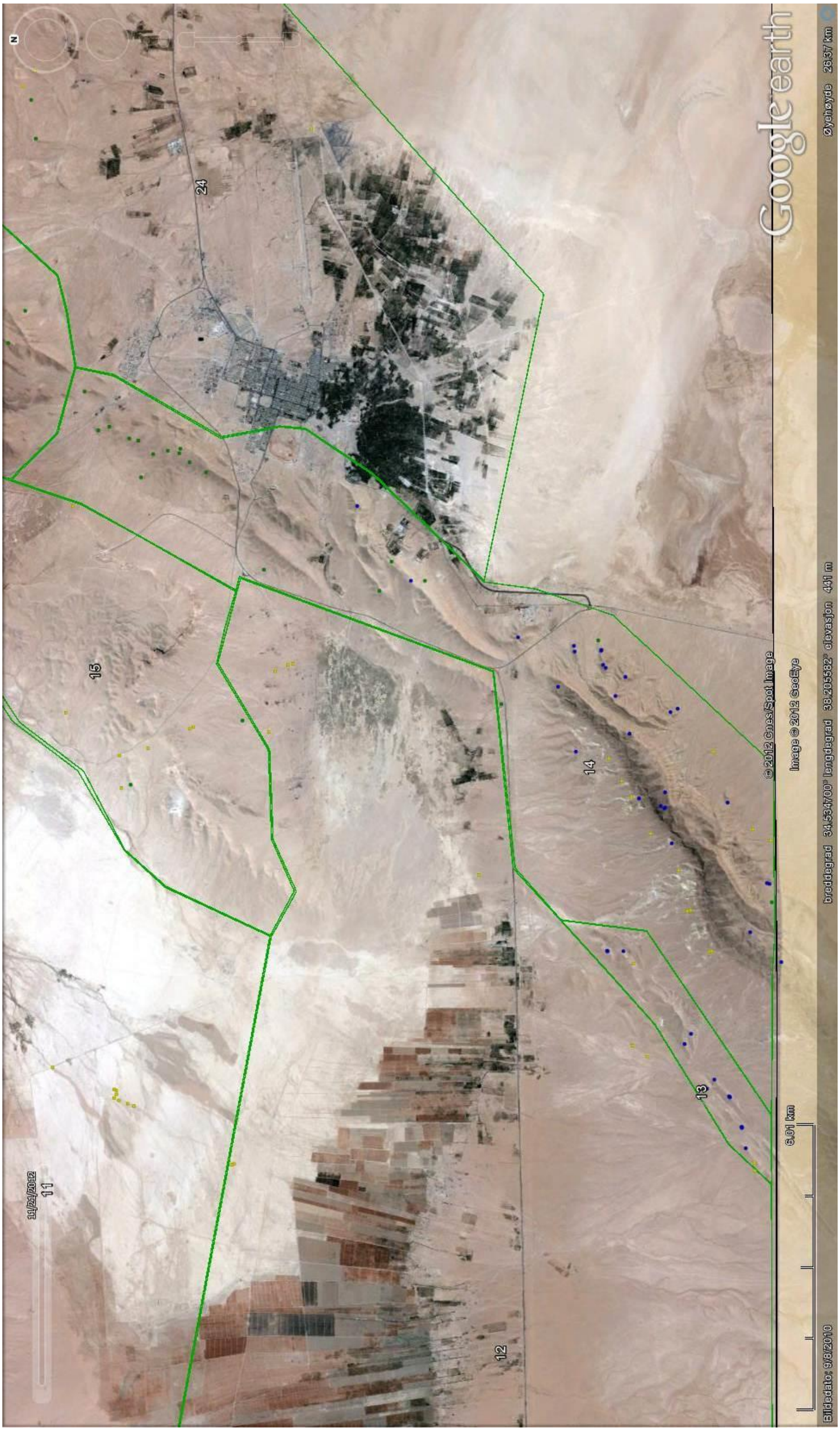
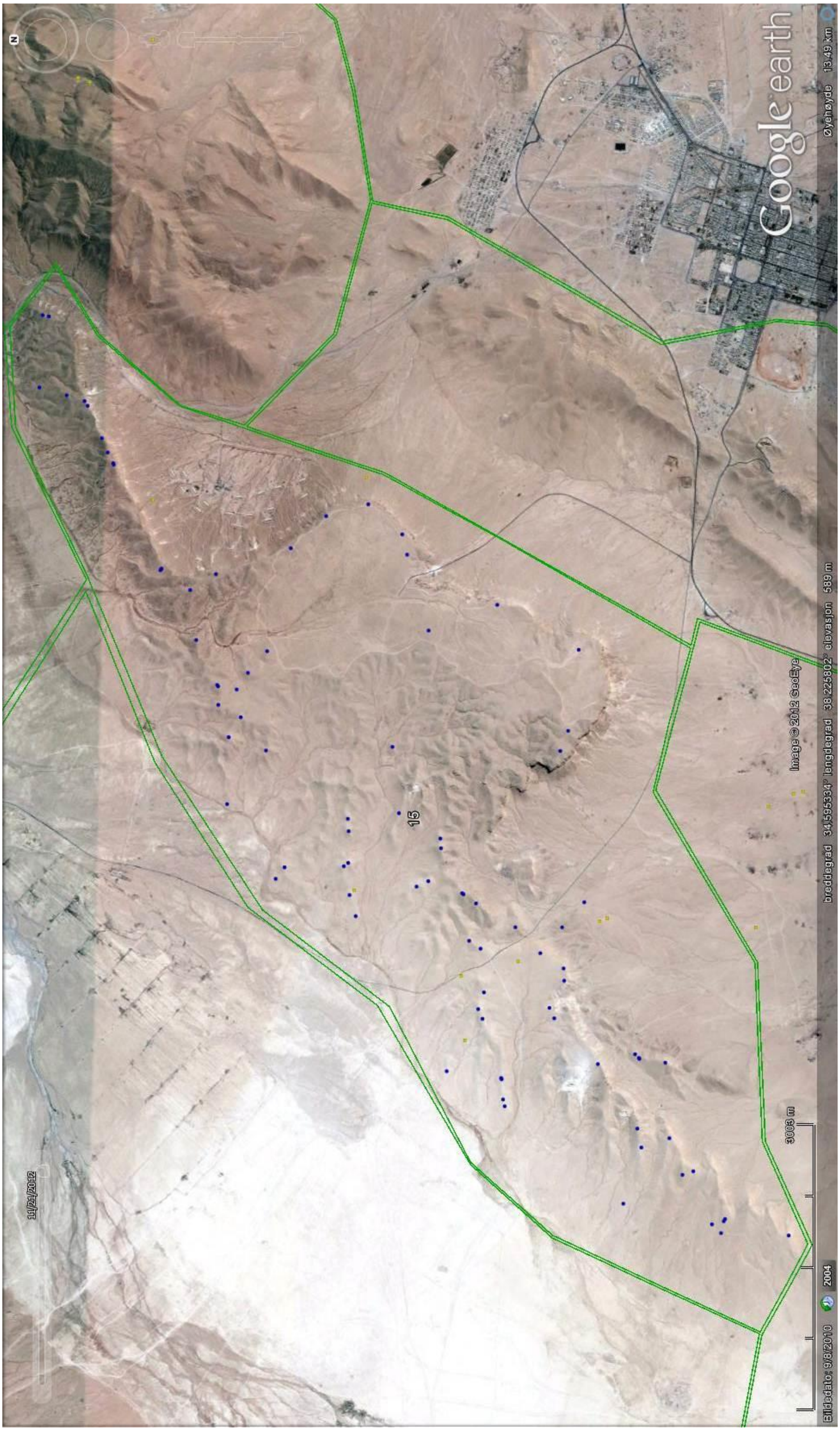
Øyenøyde 22,10 km

X


24
15
14
13
12
11
6.01 km
© 2012 Cnes/Spot Image
Image © 2012 GeoEye
Google earth
Bildedato: 9/8/2010
11/21/2012



Google earth
Øyehøyde 13,49 km
15
Image © 2012 GeoEye
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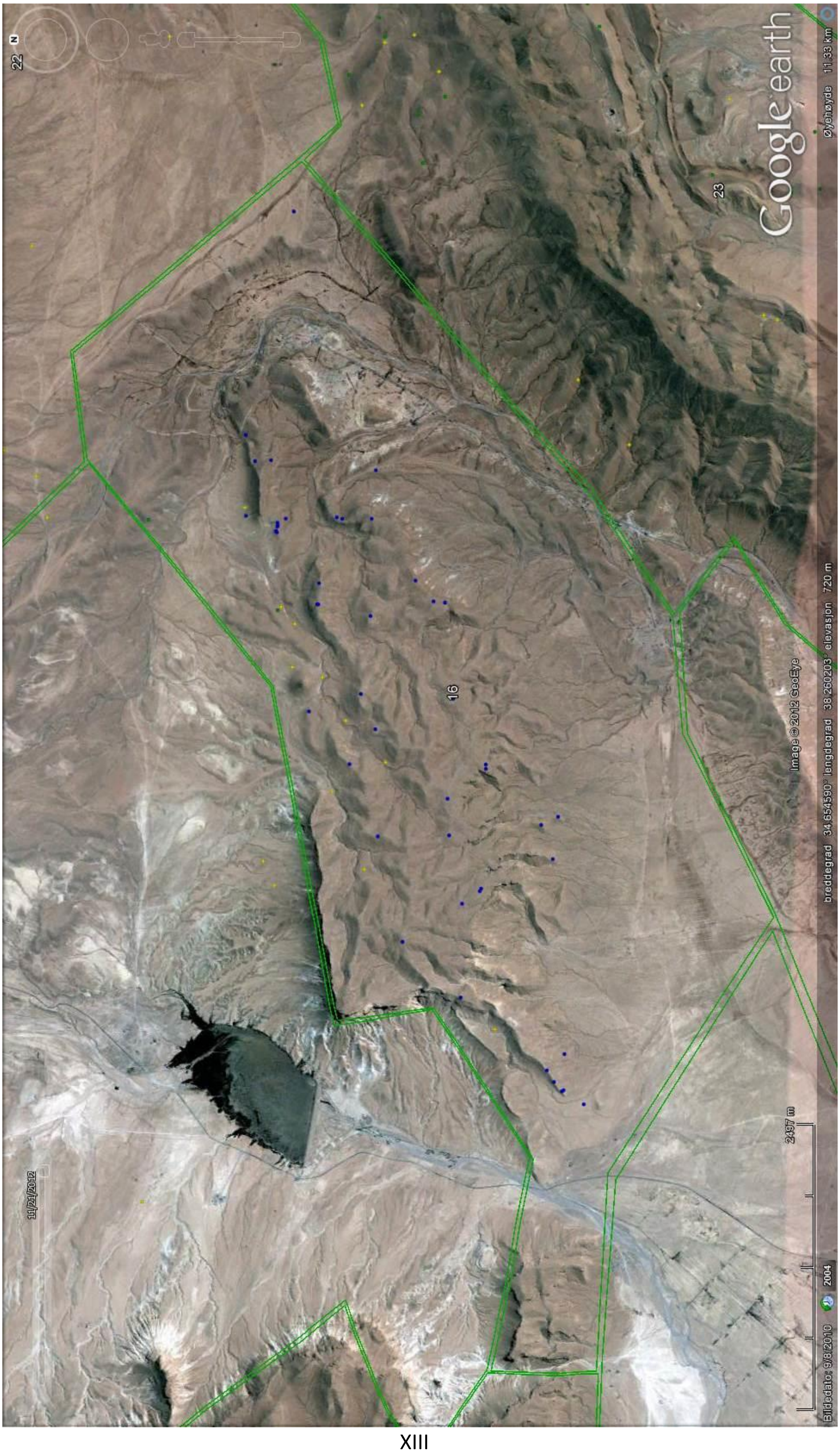
2004
11/21/2012



22
16
23
Google earth
Image © 2012 GeoEye
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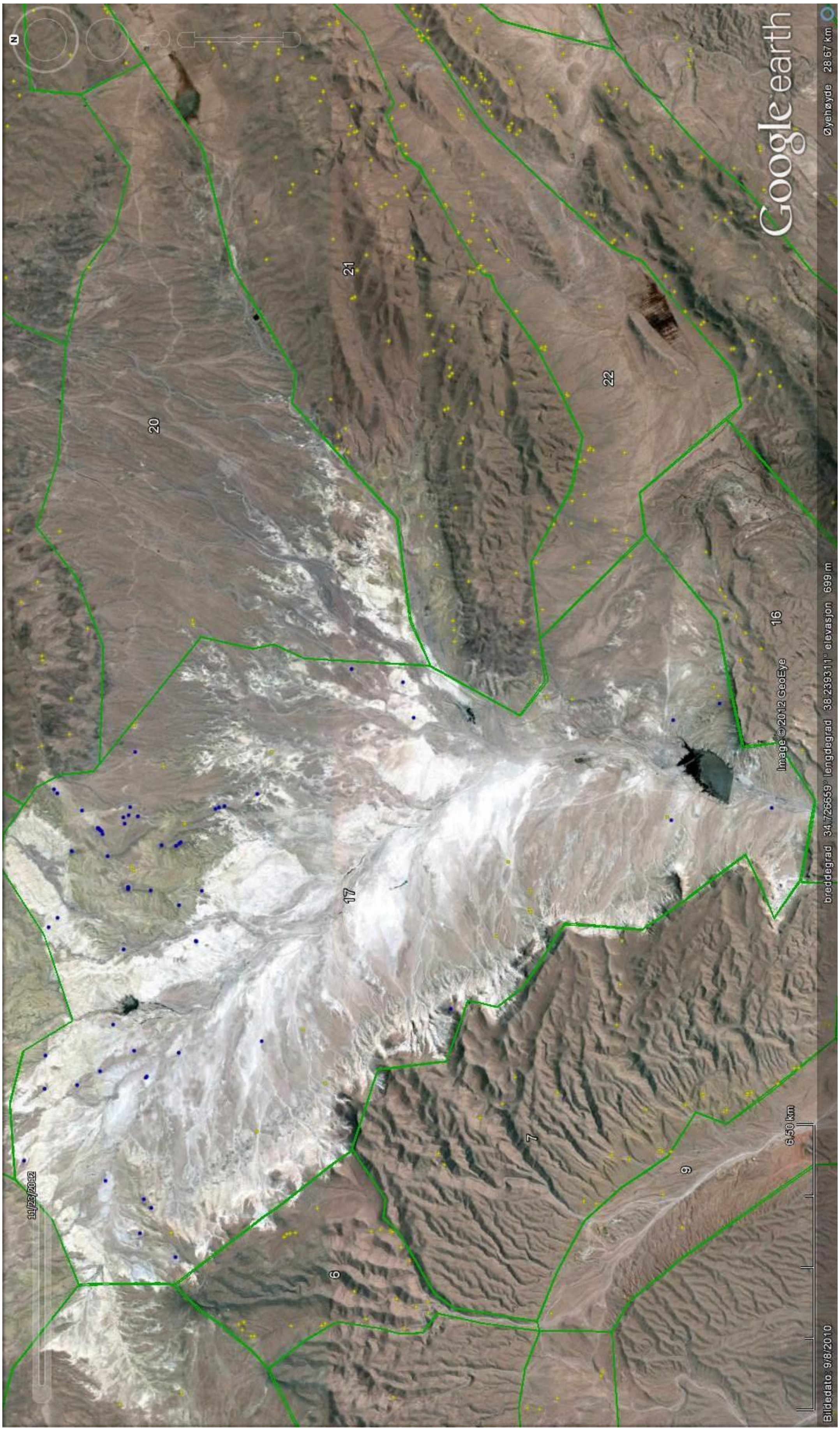
2004
2497 m
11/21/2012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22
16
17
7
9
6
Google earth
Image © 2012 GeoEye
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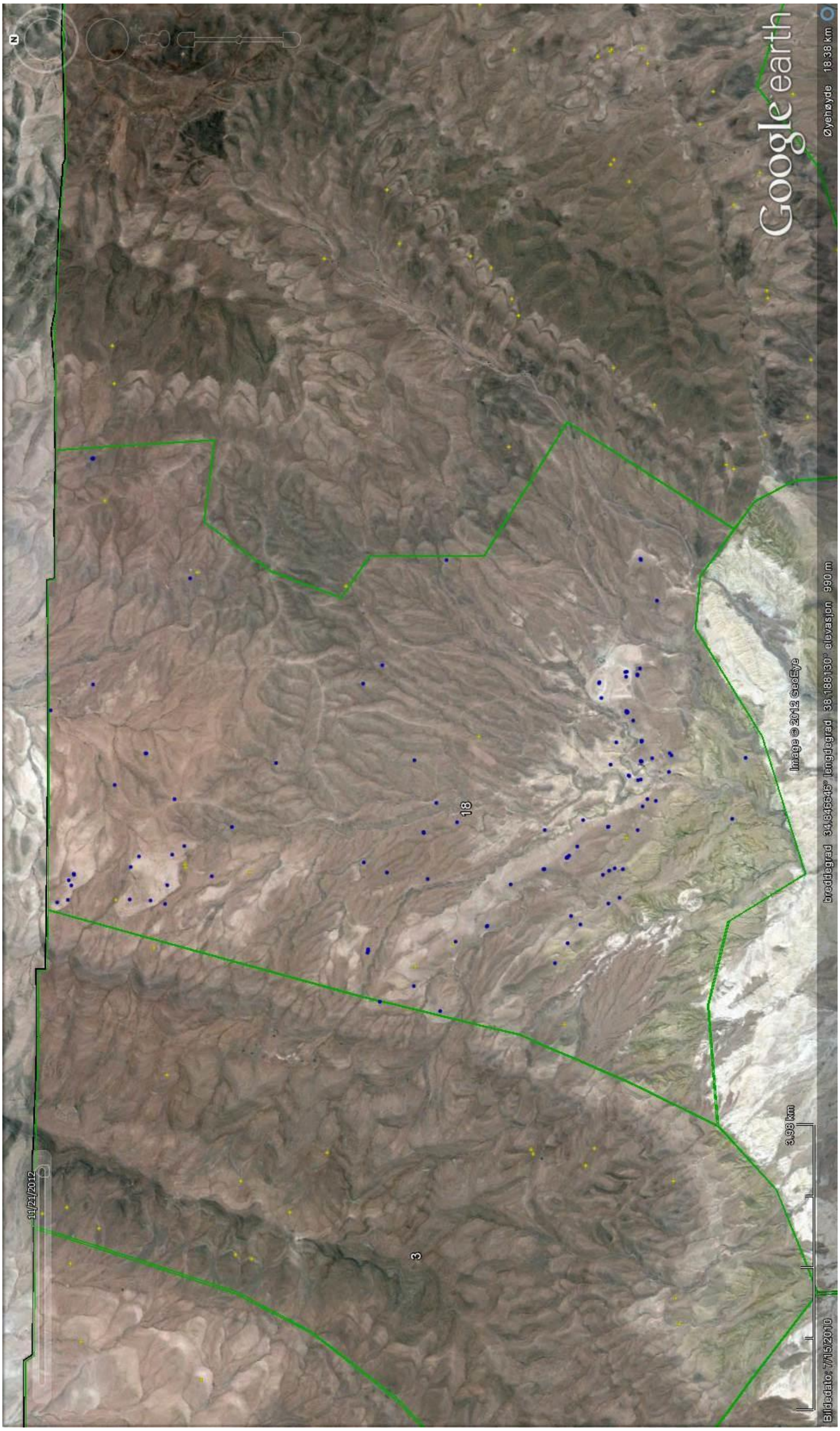
11/23/2012
6.50 km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Google earth
Image © 2012 GeoEye
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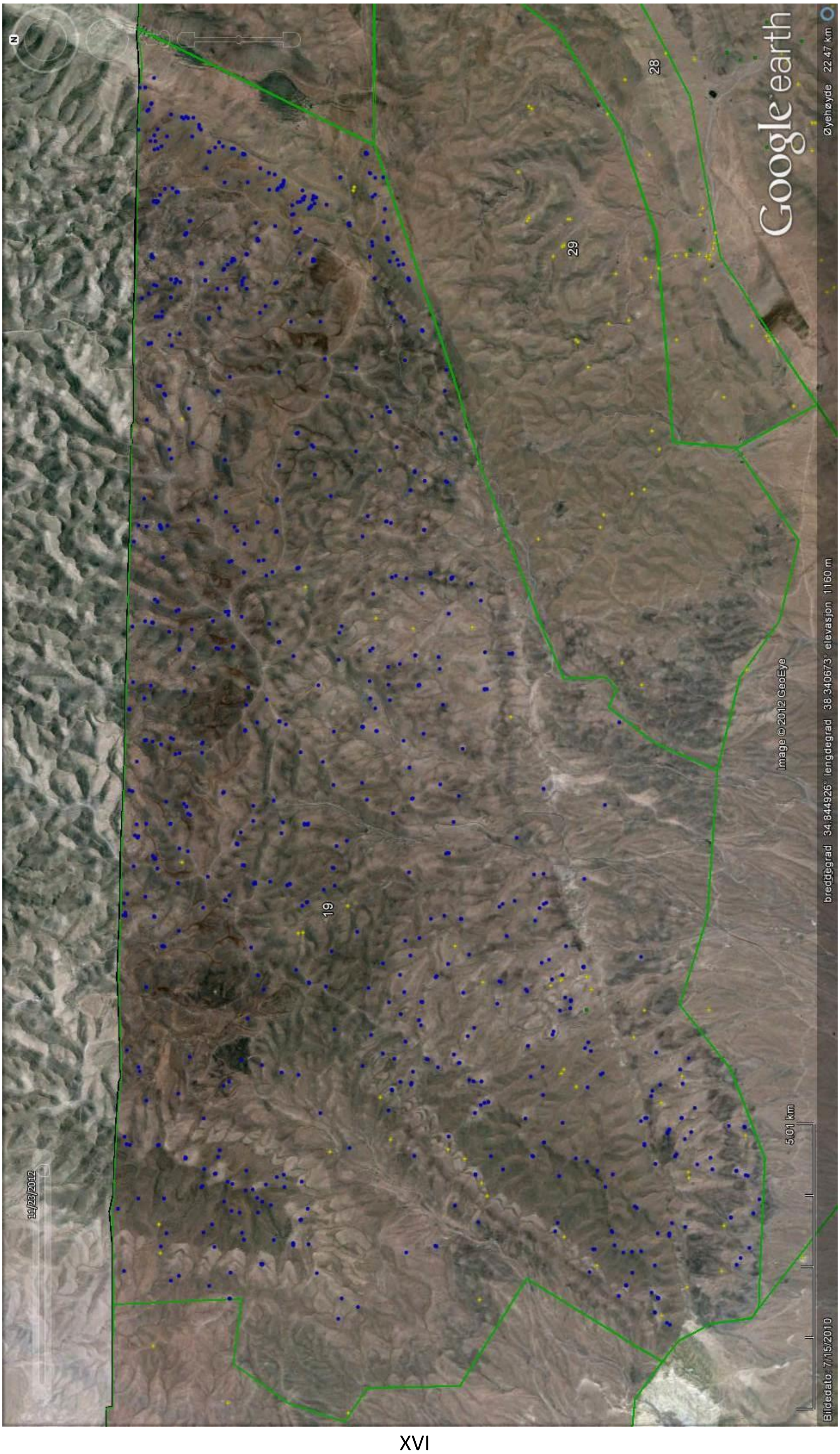
11/21/2012
3,98 km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29
Google earth
Image © 2012 GeoEye
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11/23/2012

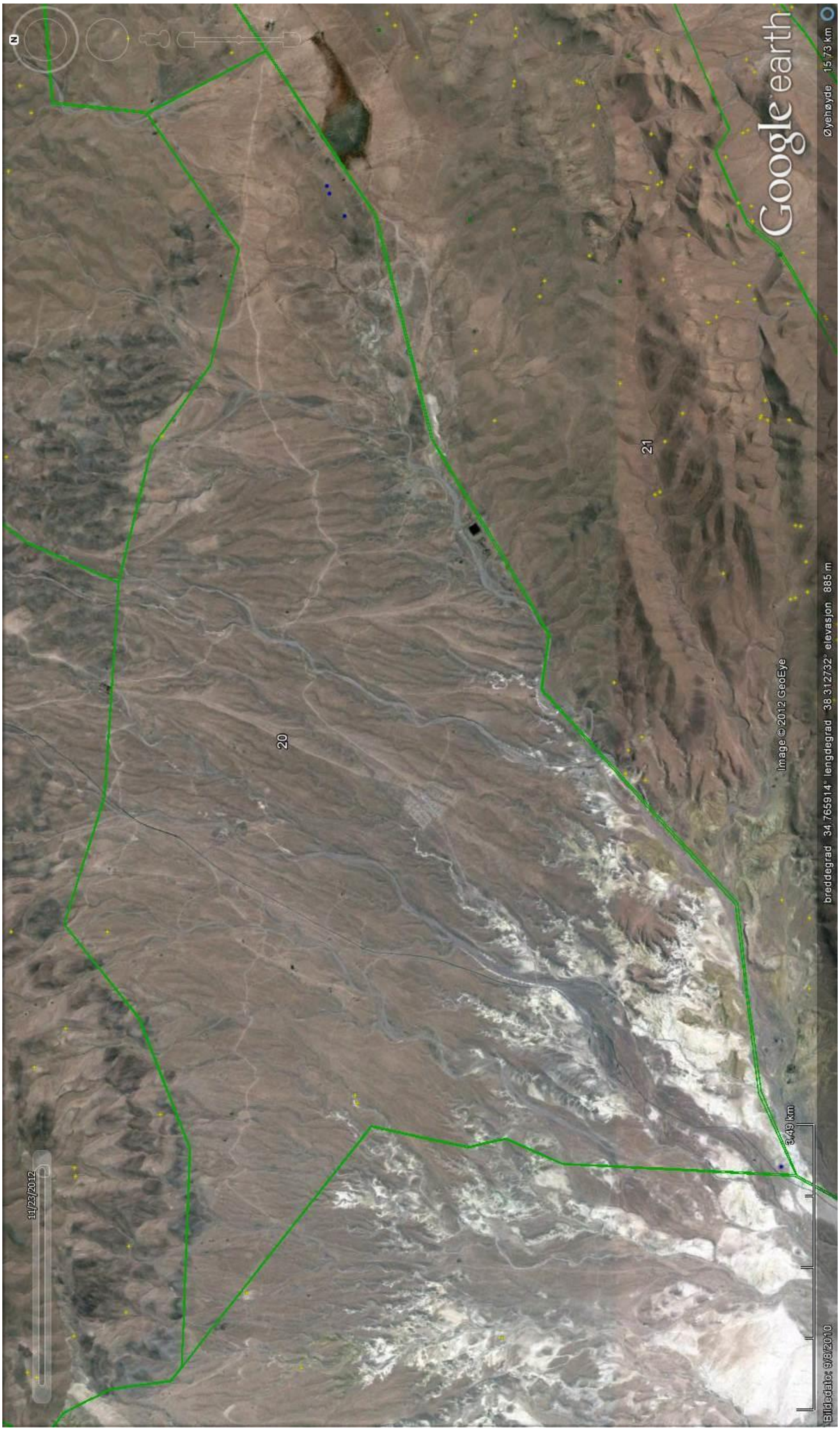
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Image © 2012 GeoEye
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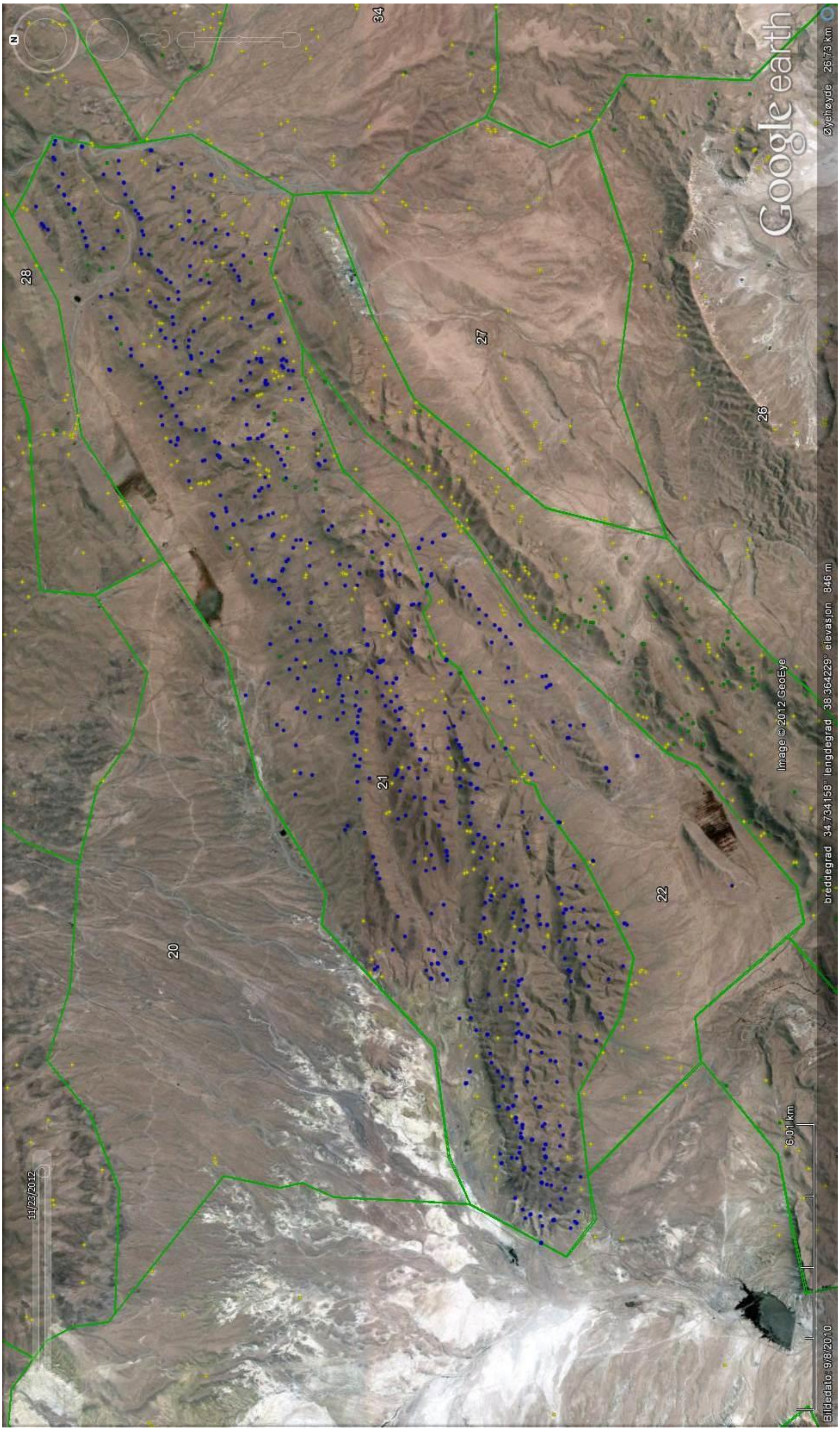
11/23/2012
3.49 km


34
28
27
26
21
22
20
Google earth
Image © 2012 GeoEye
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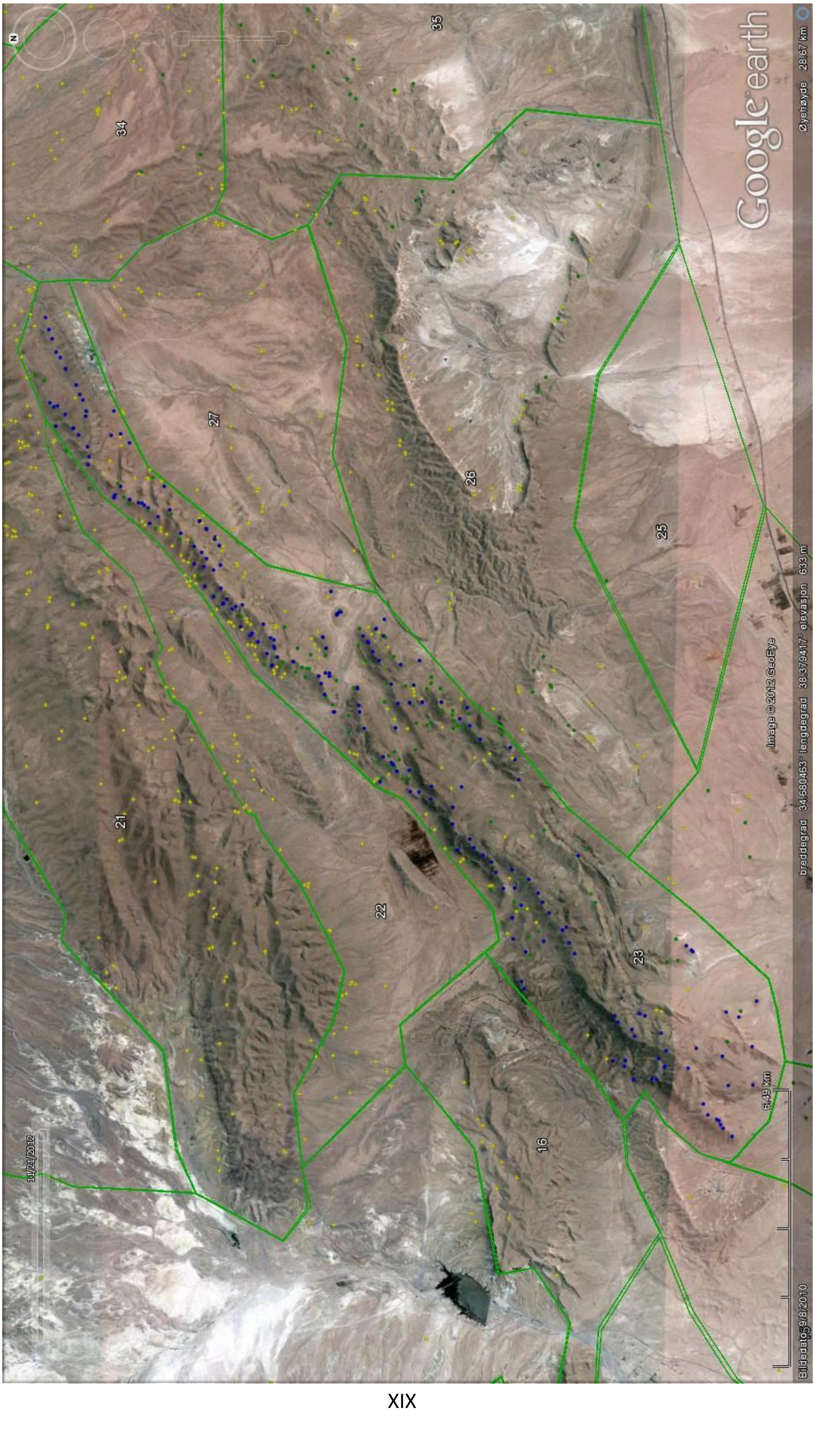
11/23/2012
6.01 km



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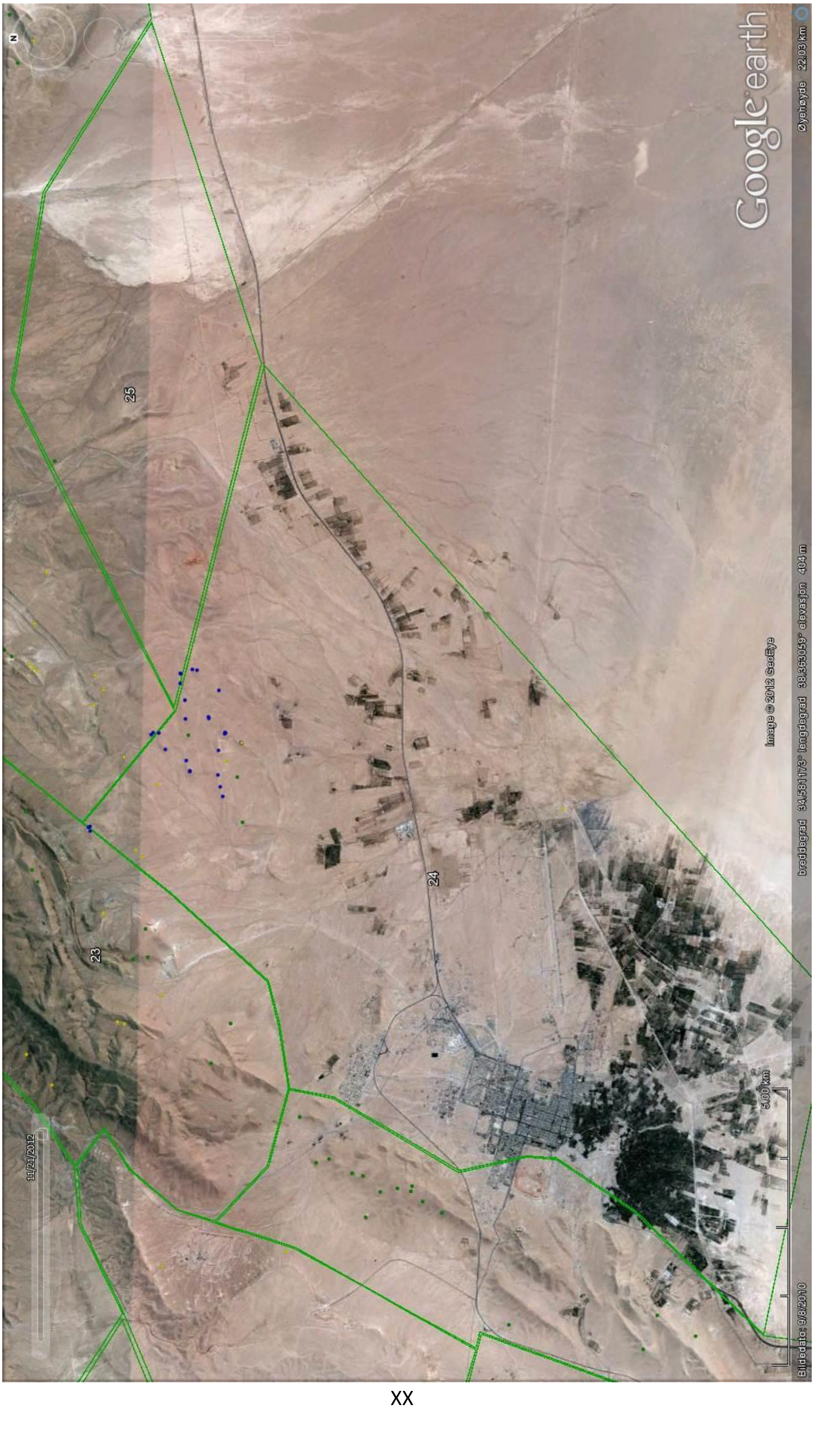
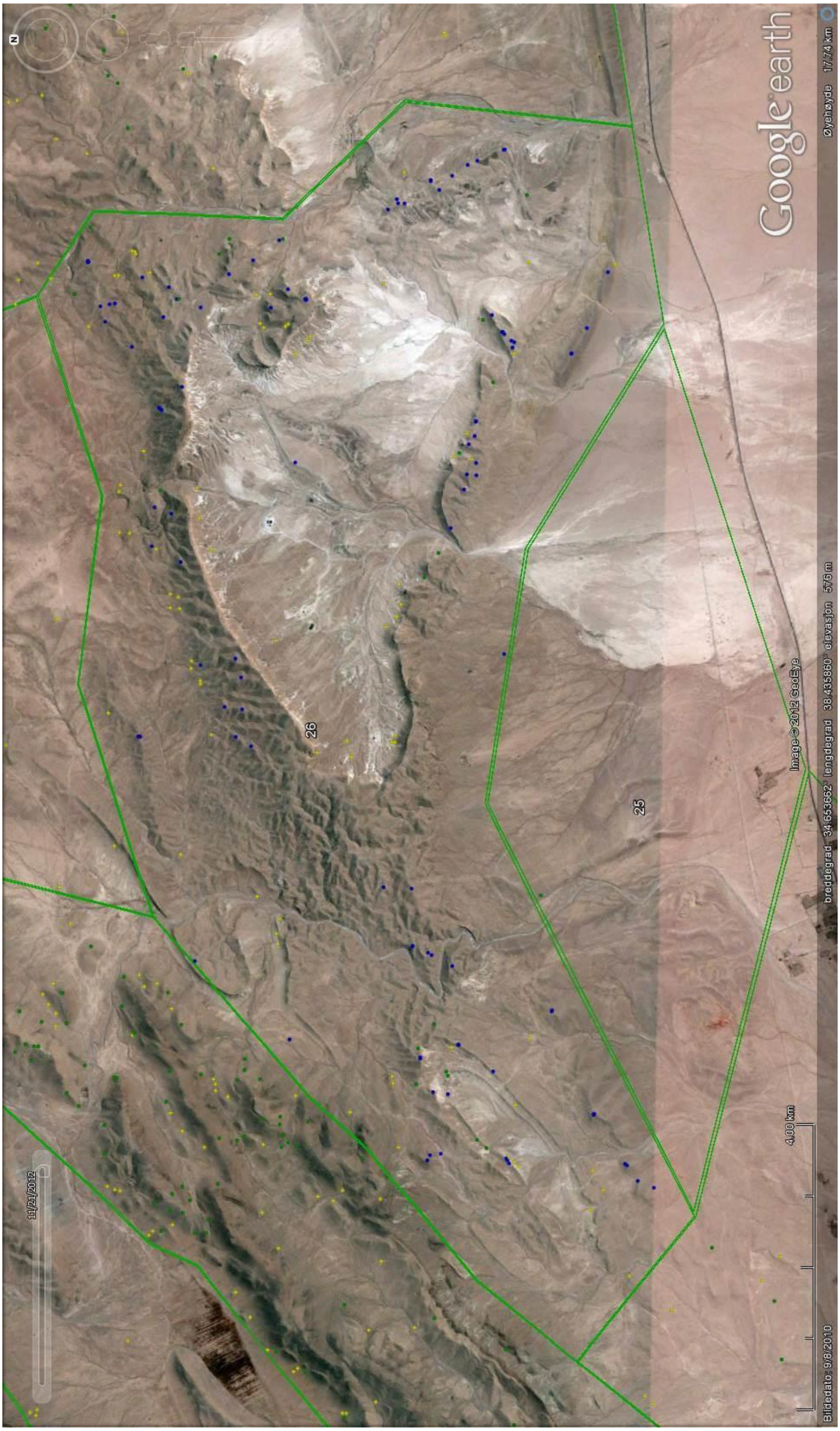
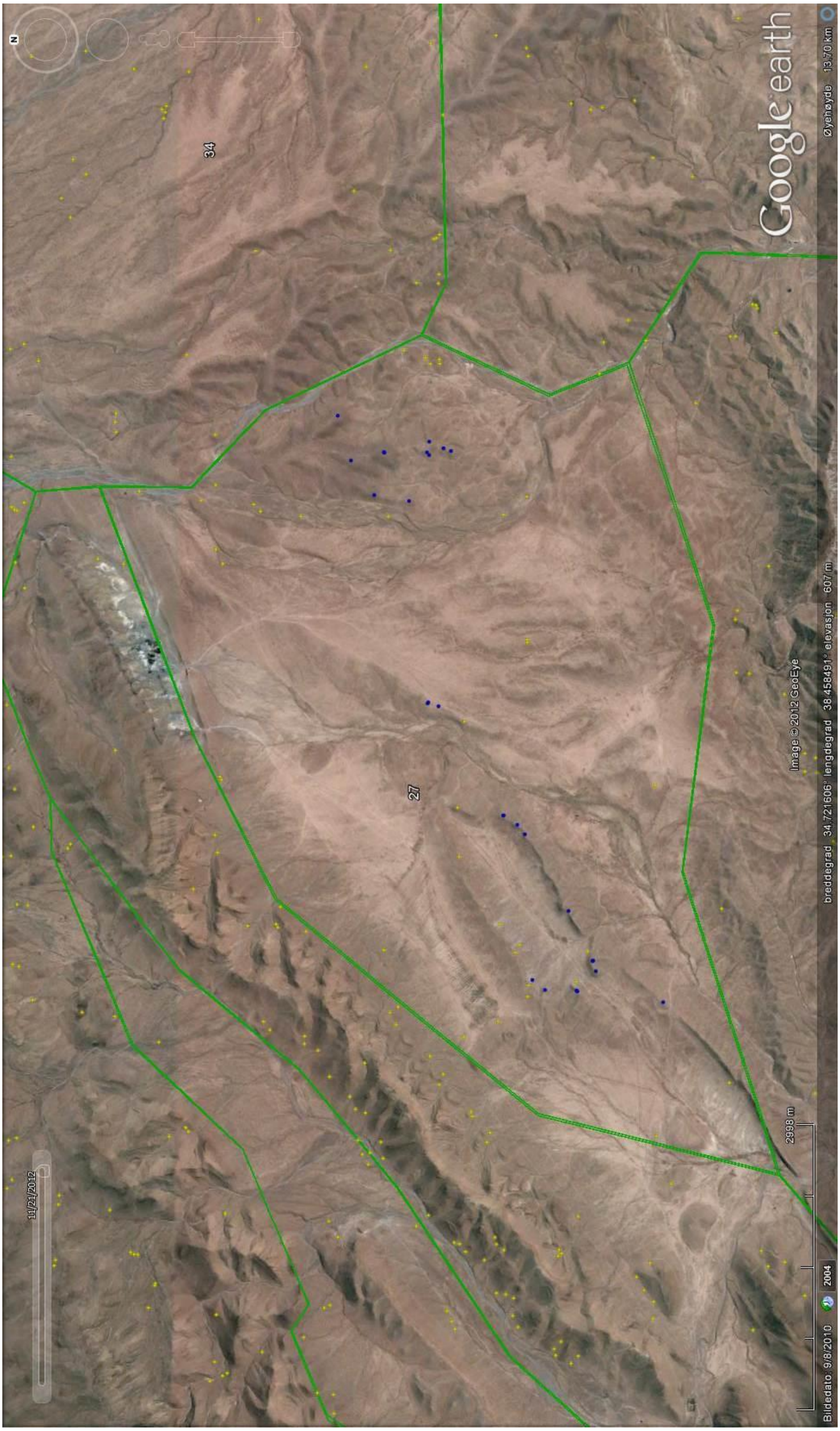
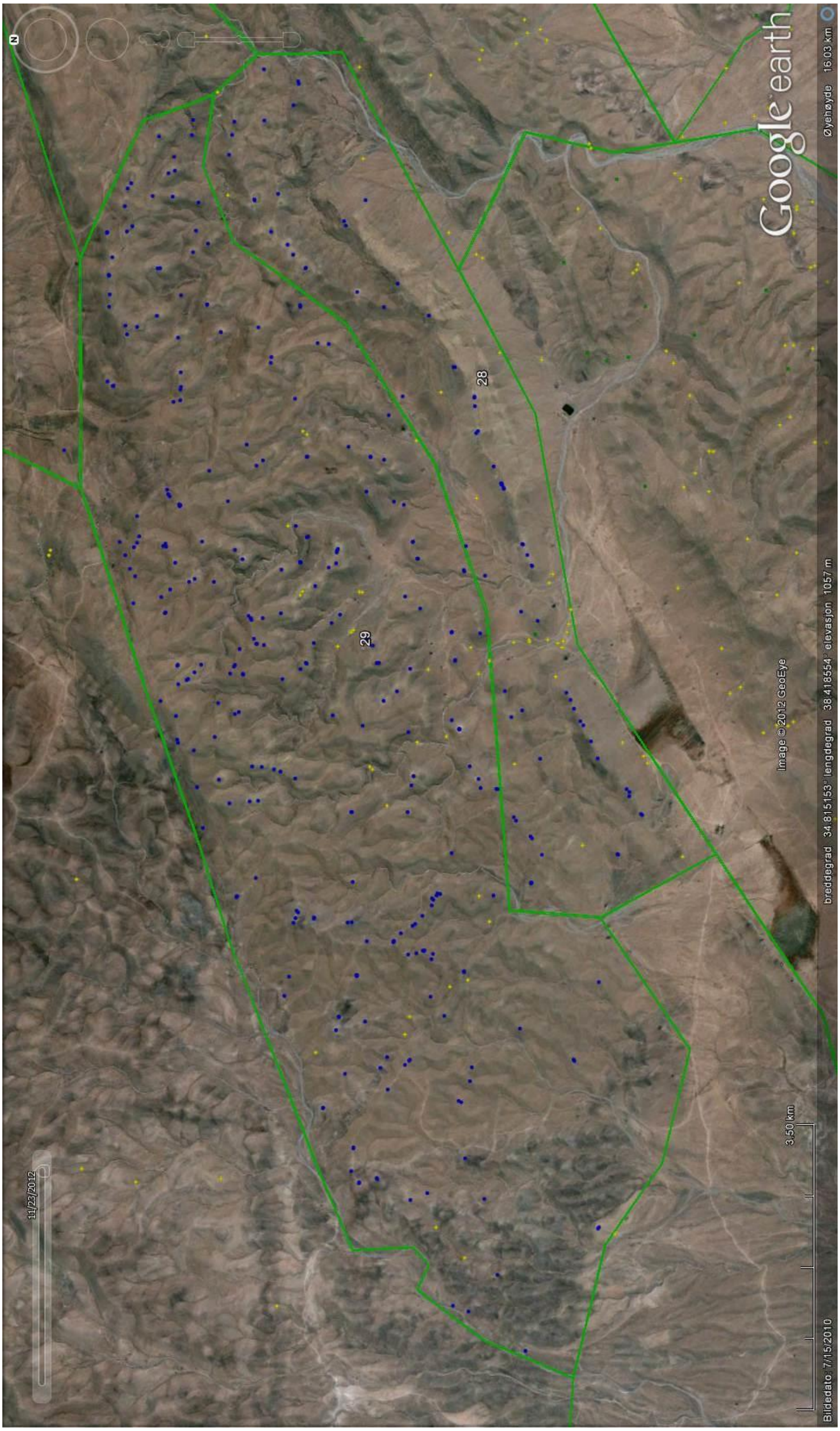
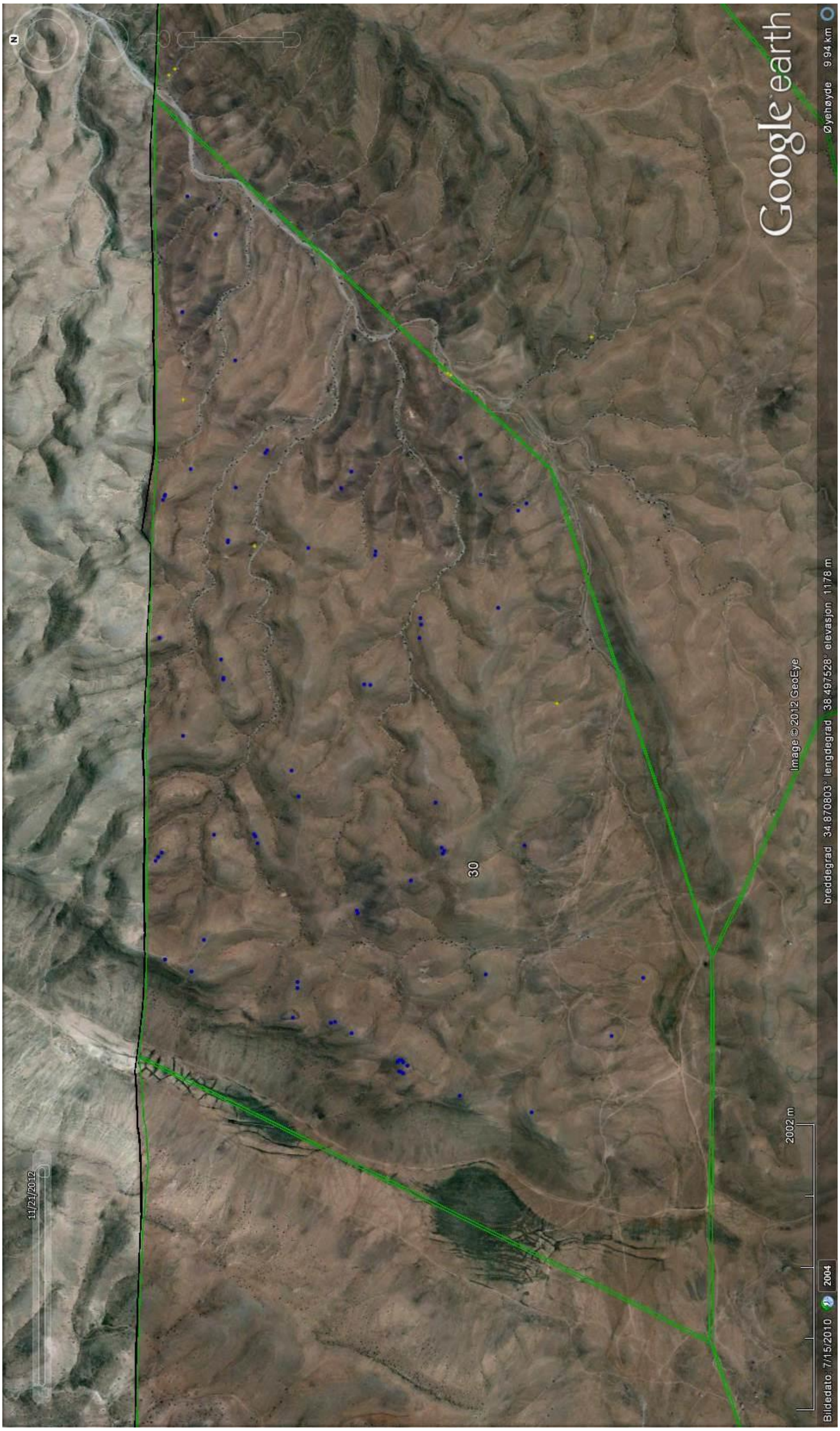
35
27
26
25
21
22
23
16
6.49 km
11/21/2012
Google earth
Image © 2012 GeoEye
breddegrad 34.680463° lengdegrad 38.379417° elevasjon 633 m
Øyehøyde 28.67 km
Bildedato 9/8/2010

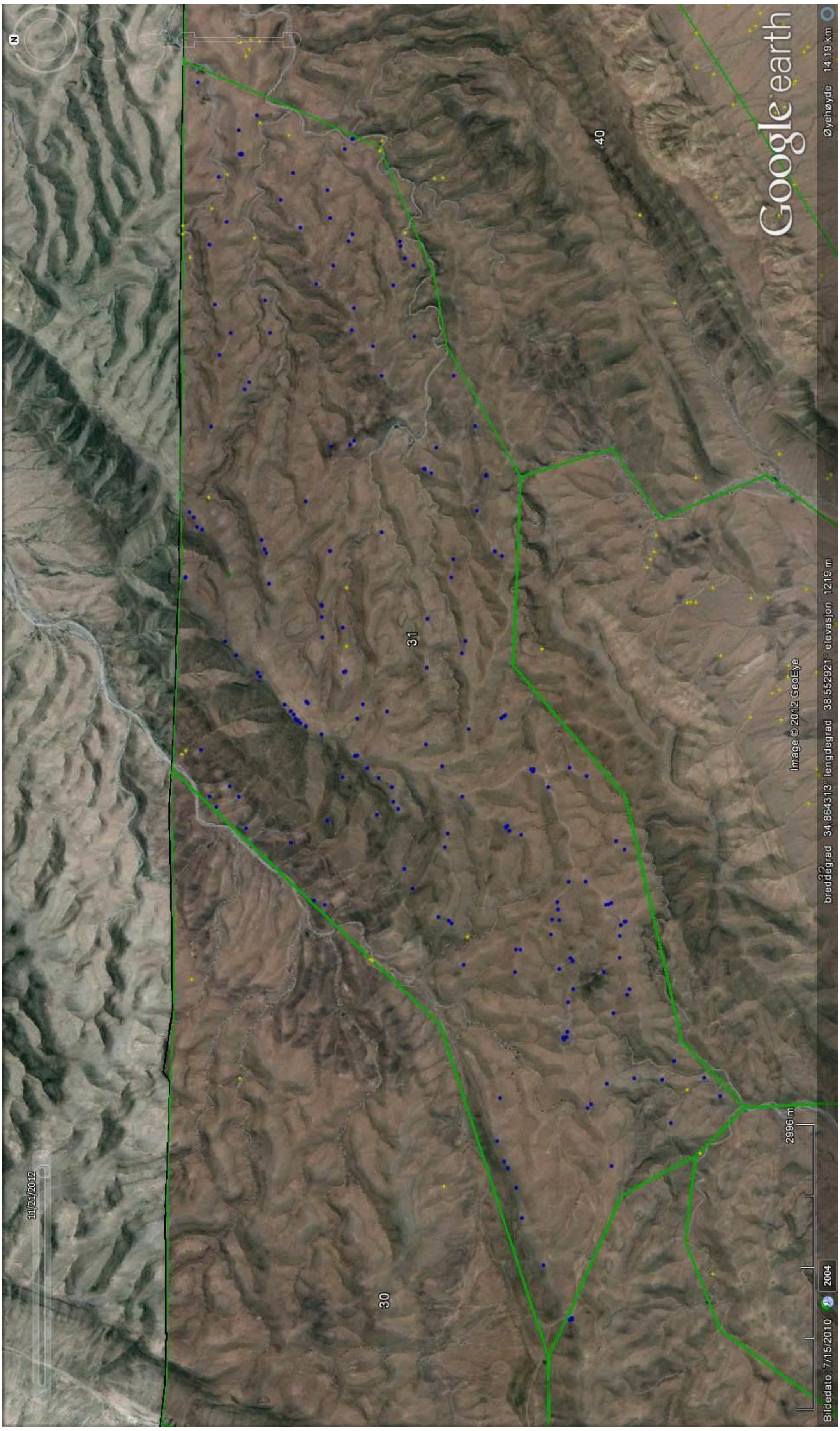

25
24
23
11/21/2012
5,00 km
Image © 2012 GeoEye
Google earth
Bildedato: 9/8/2010
breddegrad 34,581173° lengdegrad 38,363059° elevasjon 404 m
Øyehøyde 22,03 km


26
25
Image © 2012 GeoEye
breddegrad 34.653662° lengdegrad 38.435860° elevasjon 576 m
Øyenøyde 17.74 km
Bildedato: 9/8/2010
4.00 km
11/21/2012
Google earth

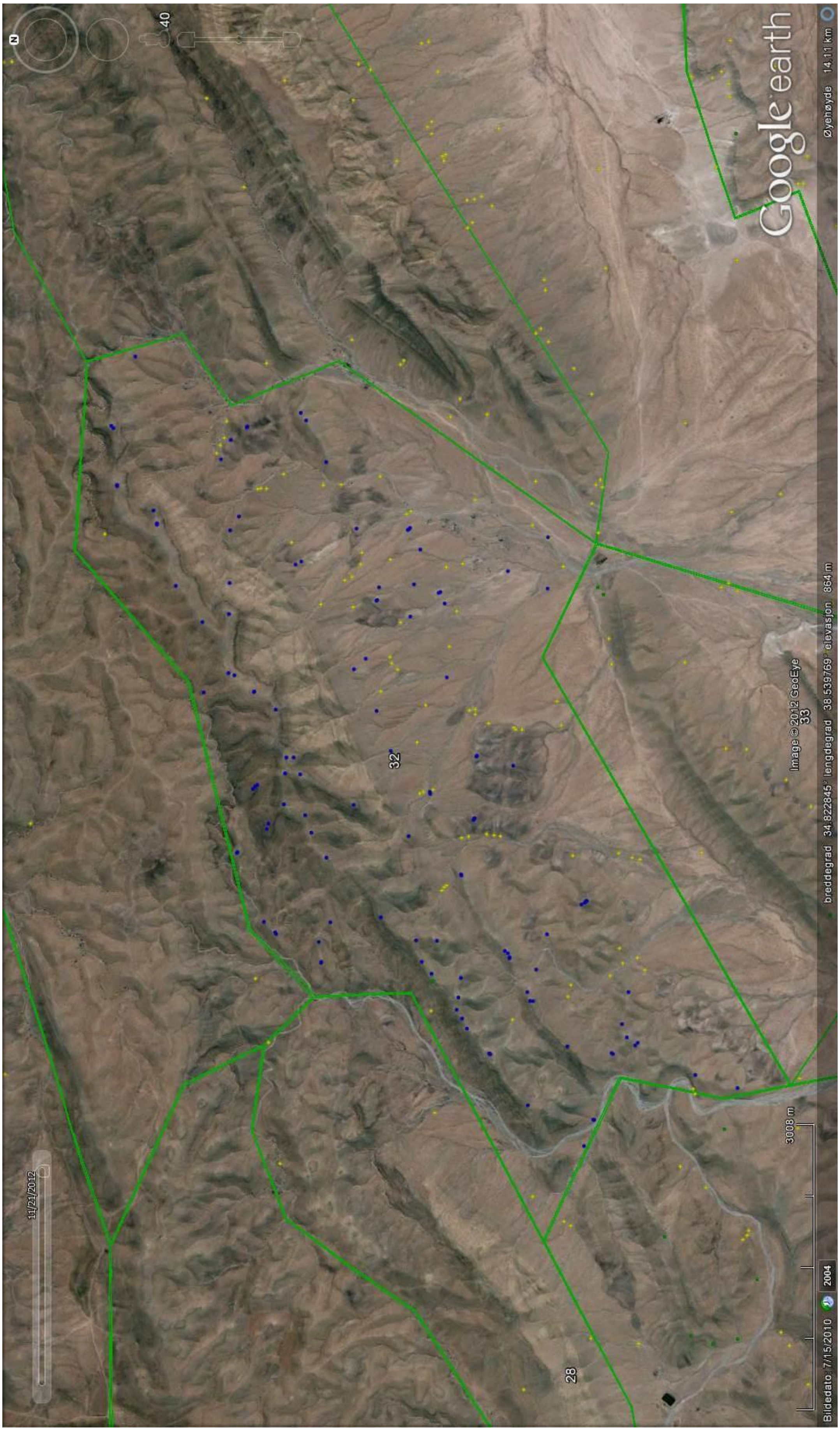

34
27
Google earth
Image © 2012 GeoEye
breddegrad 34.721606° lengdegrad 38.458491° elevasjon 607 m
Øyenøyde 13.70 km
2998 m
Bildedato: 9/8/2010
2004
11/21/2012

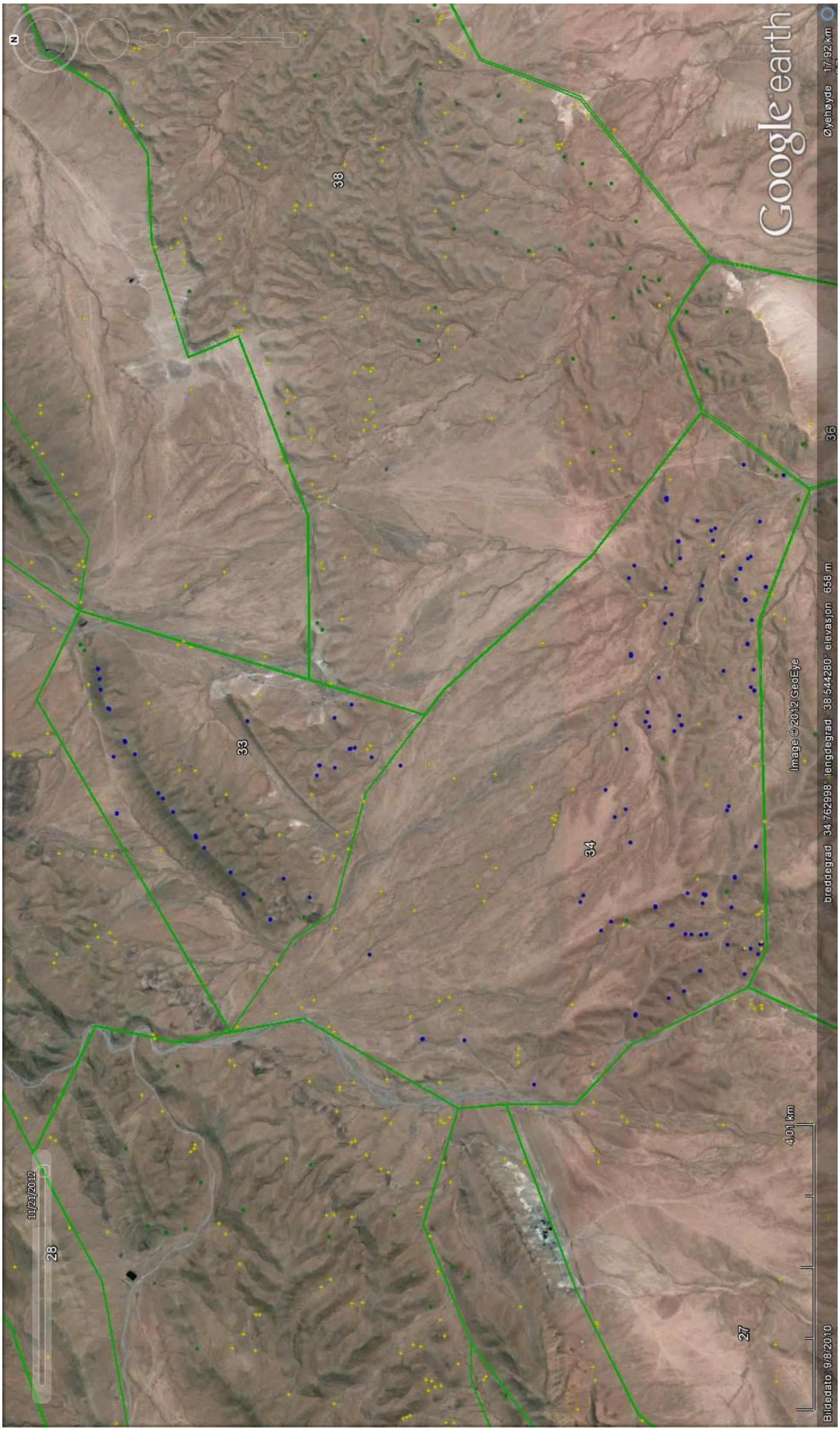

N
28
29
Image © 2012 GeoEye
Google earth
breddegrad 34.815153° lengdegrad 38.418554° elevasjon 1057 m
Øyenøyde 16.03 km
Bildedato 7/15/2010
11/23/2012
3.50 km


Google earth
Image © 2012 GeoEye
30
2002 m
11/21/2012
2004
Bildedato: 7/15/2010
breddegrad 34.870803° lengdegrad 38.497528° elevasjon 1178 m
Øyehøyde 9.94 km

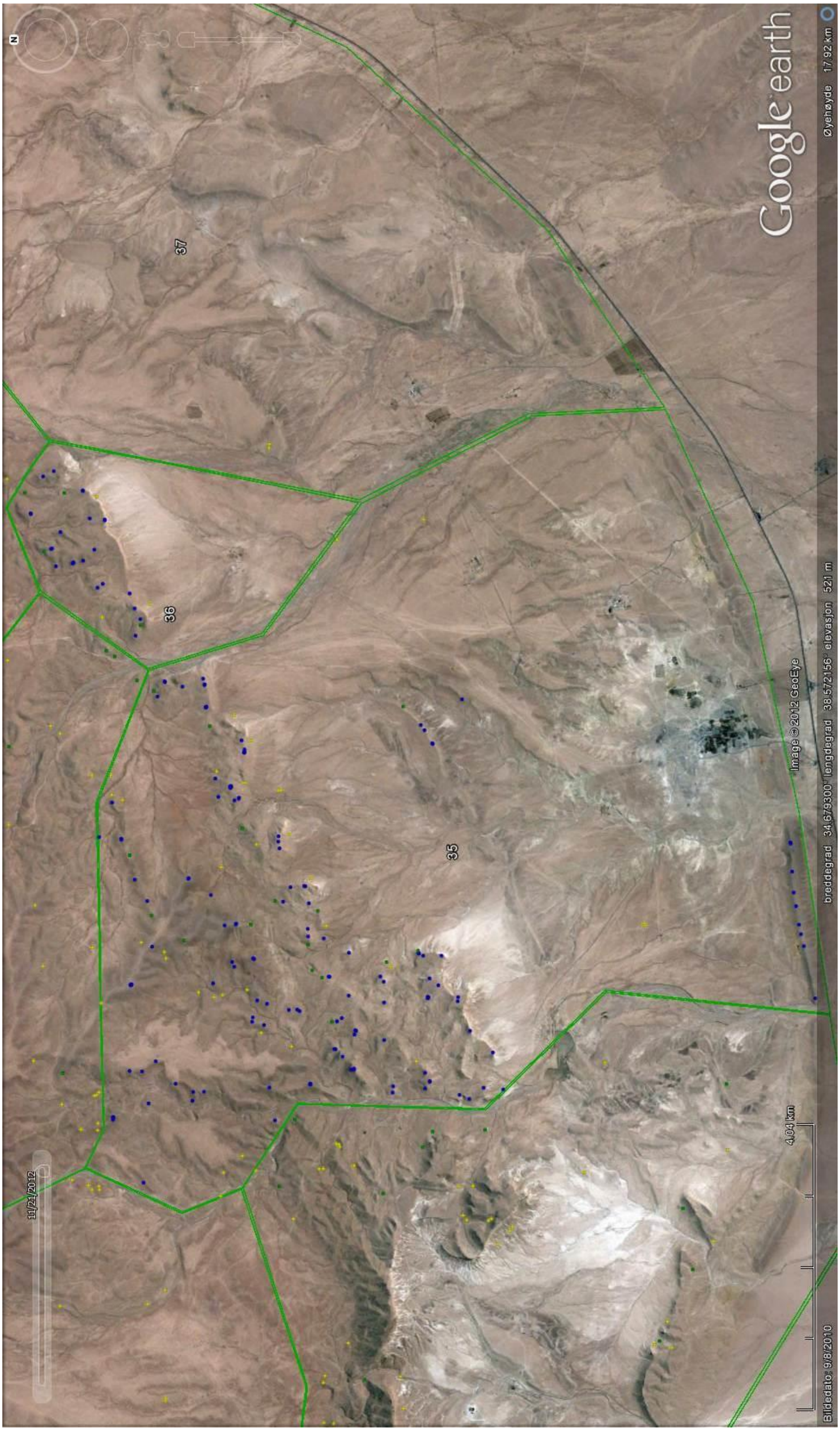


31
30
40
Google earth
Image © 2012 GeoEye
Bildedato: 7/15/2010
2004
2996 m
11/21/2012

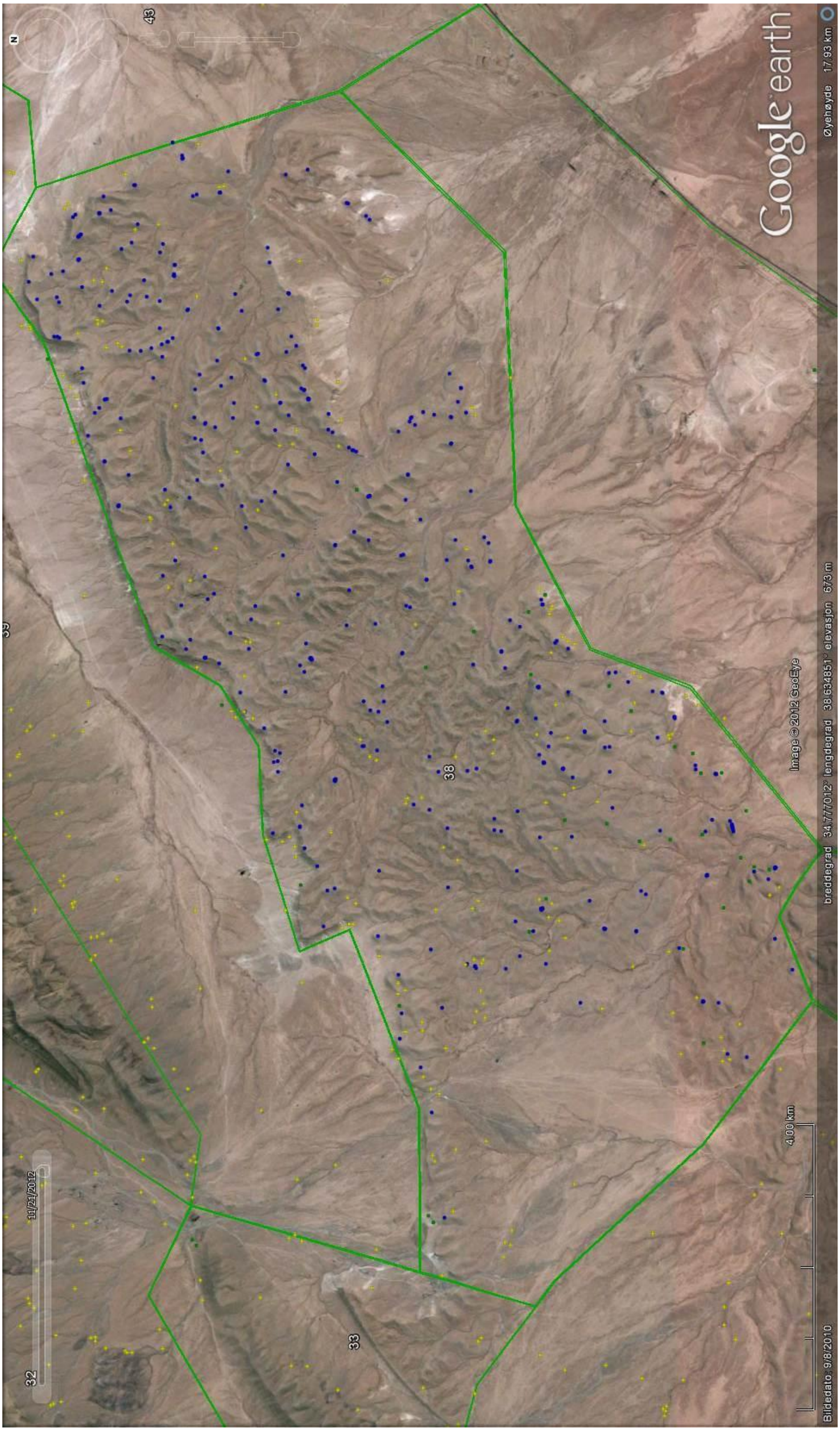

40
32
33
28
Image © 2012 GeoEye
Google earth
breddegrad 34.822845° lengdegrad 38.539769° elevasjon 864 m
Øyehøyde 14.11 km
Bildedato 7/15/2010
2004
11/21/2012
3008 m



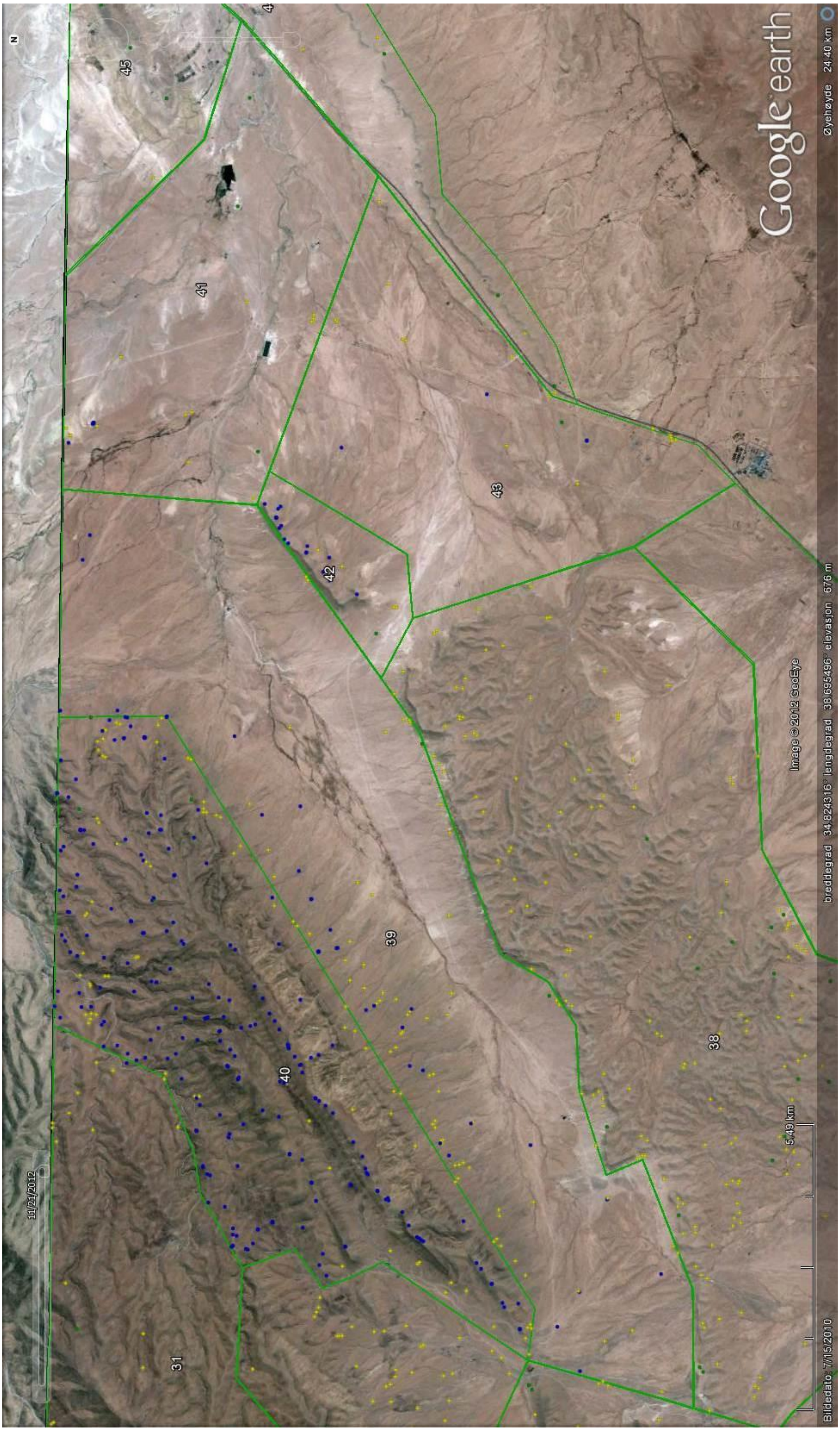
38
33
34
36
28
27
Google earth
Image © 2012 GeoEye
breddegrad 34.762998° lengdegrad 38.544280° elevasjon 658 m
Øyehøyde 17.92 km
Bildedato 9/8/2010
11/21/2012
4.01 km

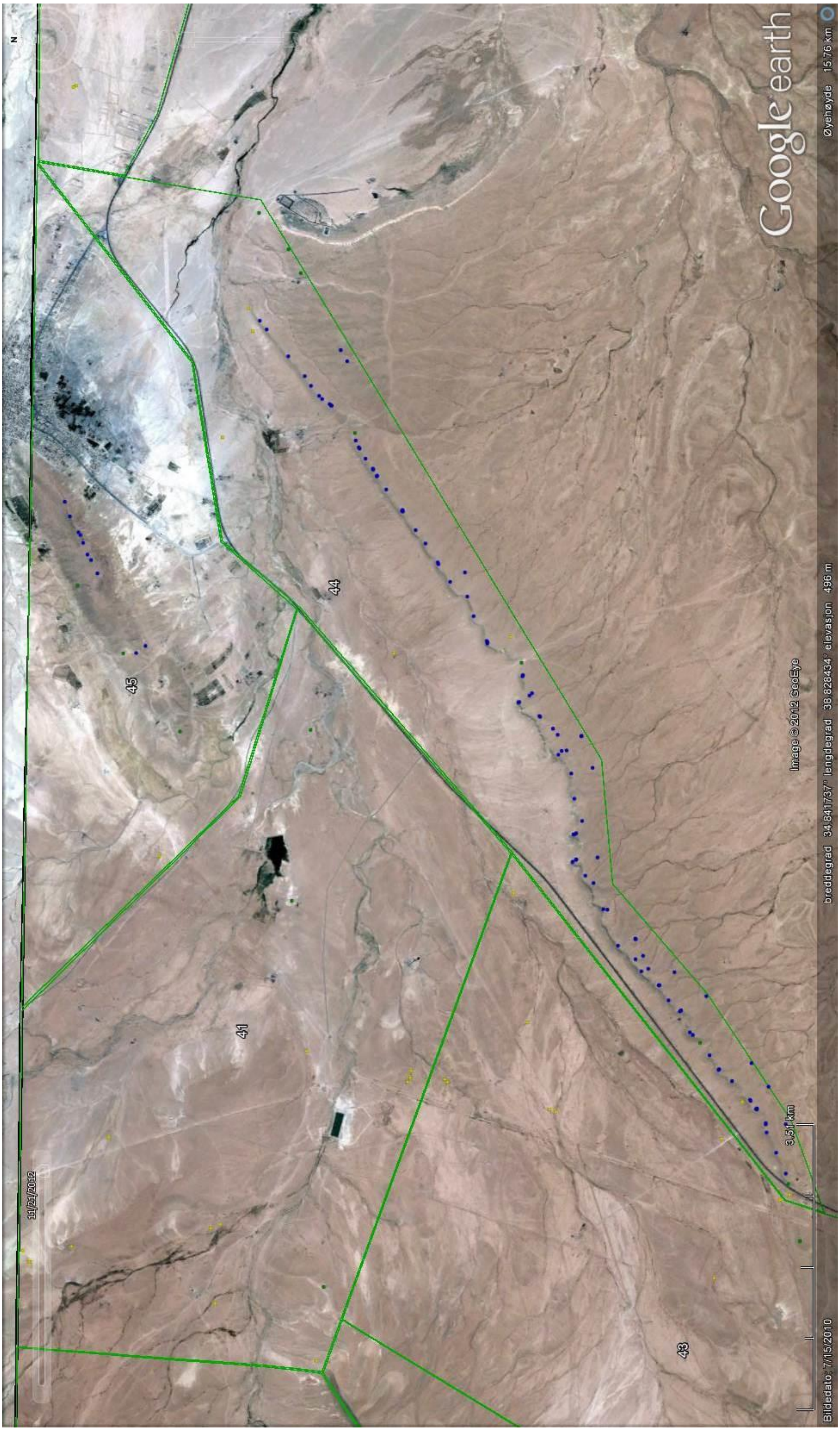

37
36
35
Google earth
Image © 2012 GeoEye
breddegrad 34.679300° lengdegrad 38.572156° elevasjon 521 m
Øyehøyde 17.92 km
4.04 km
11/21/2012
Bildedato: 9/8/2010

33
34
35
36
37
38
11/21/2012
5.50 Km
Image © 2012 GeoEye
Google earth
Bildedato 9/8/2010
breddegrad 34.716202° lengdegrad 38.665634° elevasjon 520 m
Øyehøyde 24.30 km

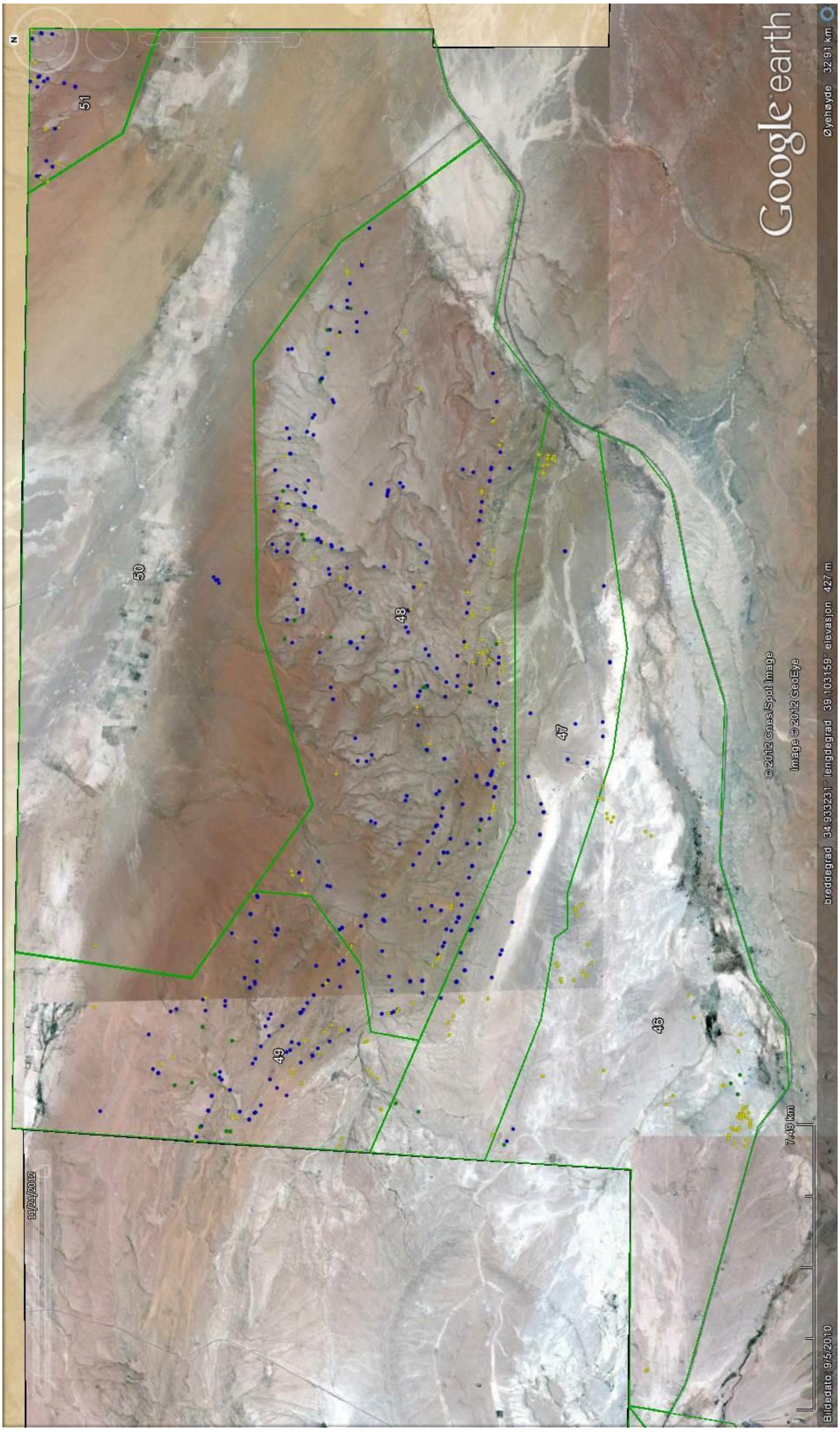

43
39
38
33
32
11/21/2012
4.00 km
Image © 2012 GeoEye
breddegrad 34.777012° lengdegrad 38.634851° elevasjon 673 m
Øyehøyde 17.93 km
Bildedato: 9/8/2010
Google earth

XXX

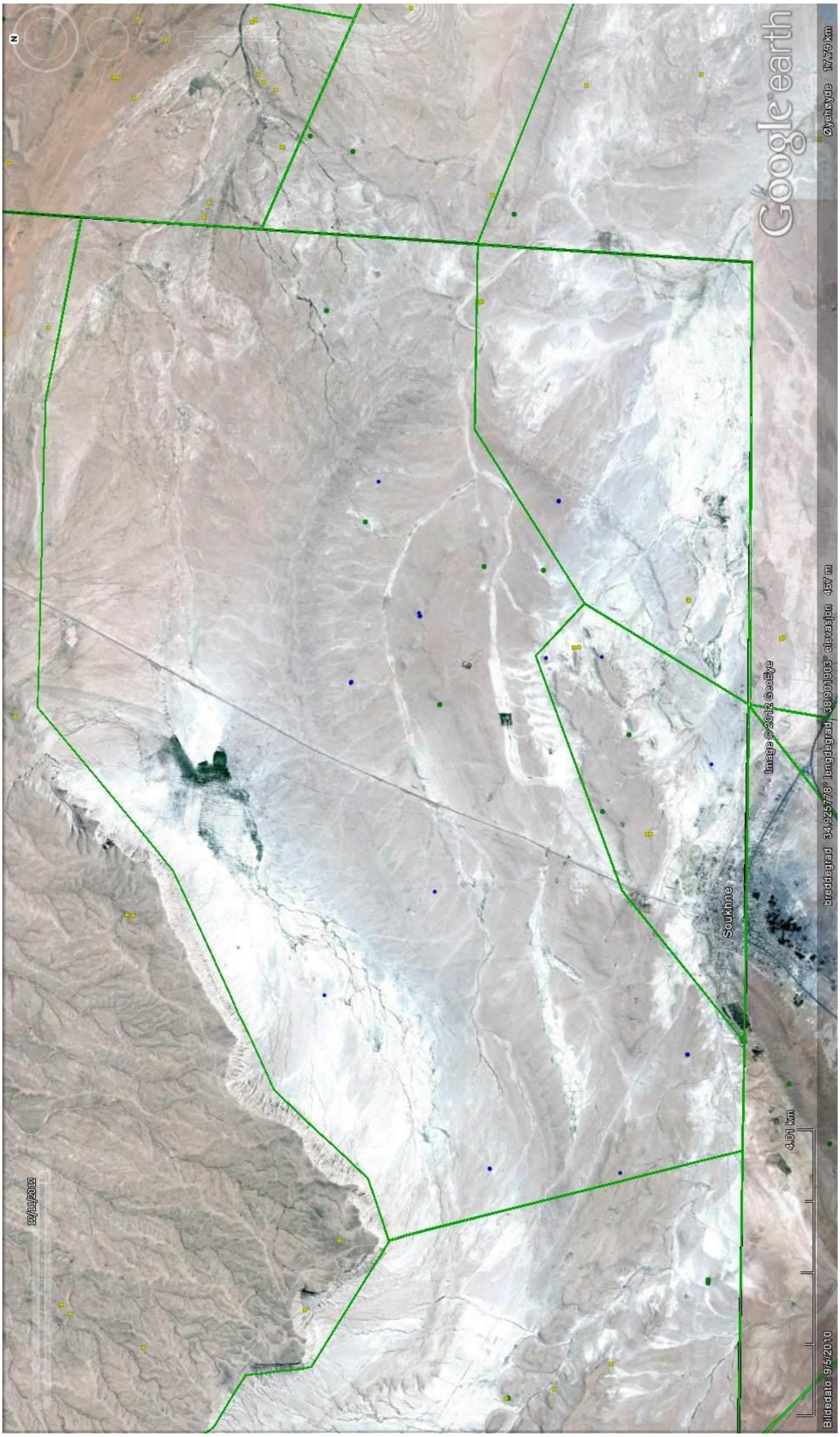

N
45
41
42
43
39
40
38
31
11/21/2012
5.49 km
Image © 2012 GeoEye
Google earth
Bildedato: 7/15/2010
breddegrad 34.824316° lengdegrad 38.695496° elevasjon 676 m
Øyehøyde 24.40 km



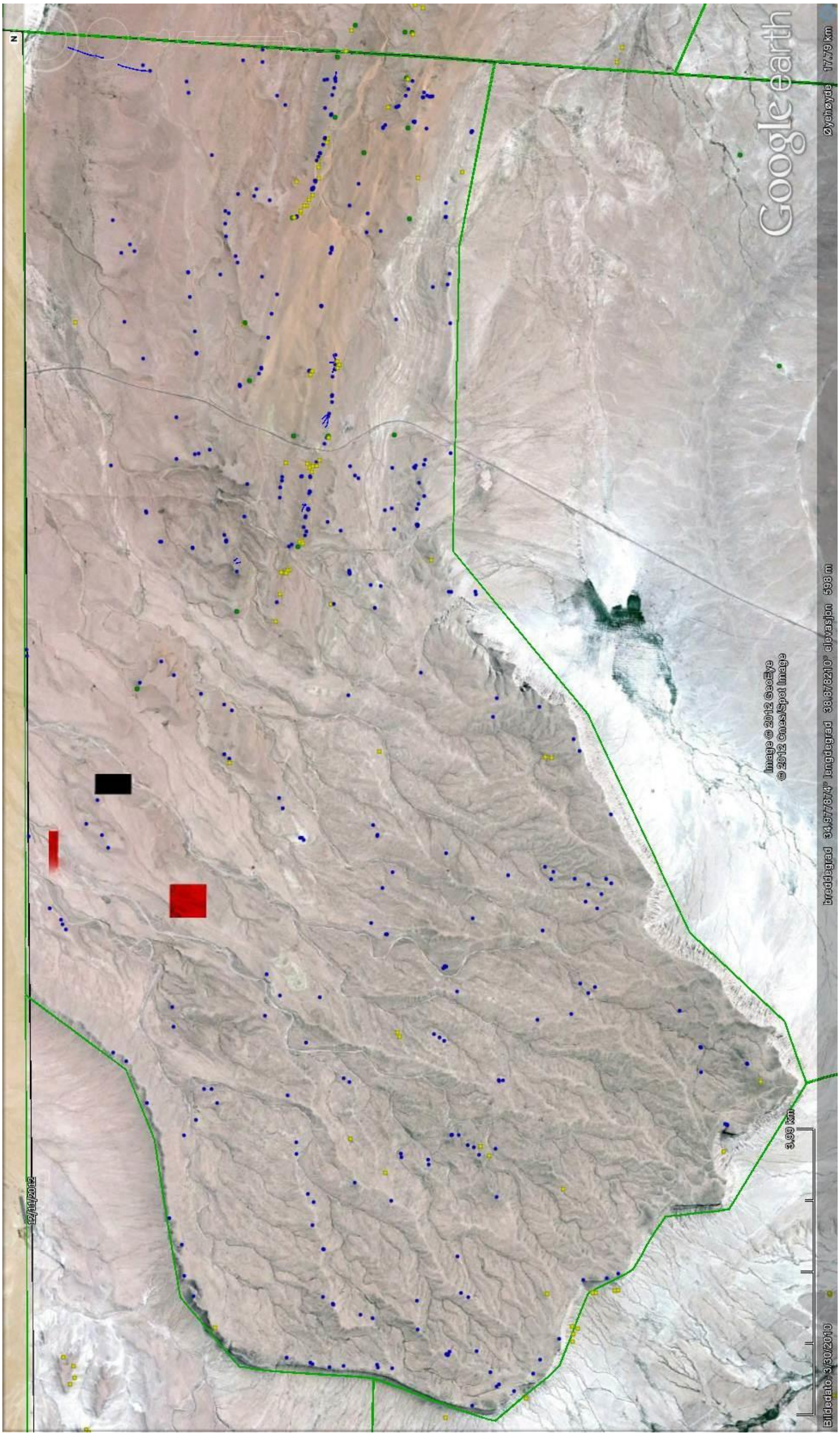
44
45
41
43
3.51 km
11/21/2012
Image © 2012 GeoEye
breddegrad 34.841737° lengdegrad 38.828434 elevasjon 496 m
Bildedato: 7/15/2010
Google earth
Øyenøyde 15.76 km

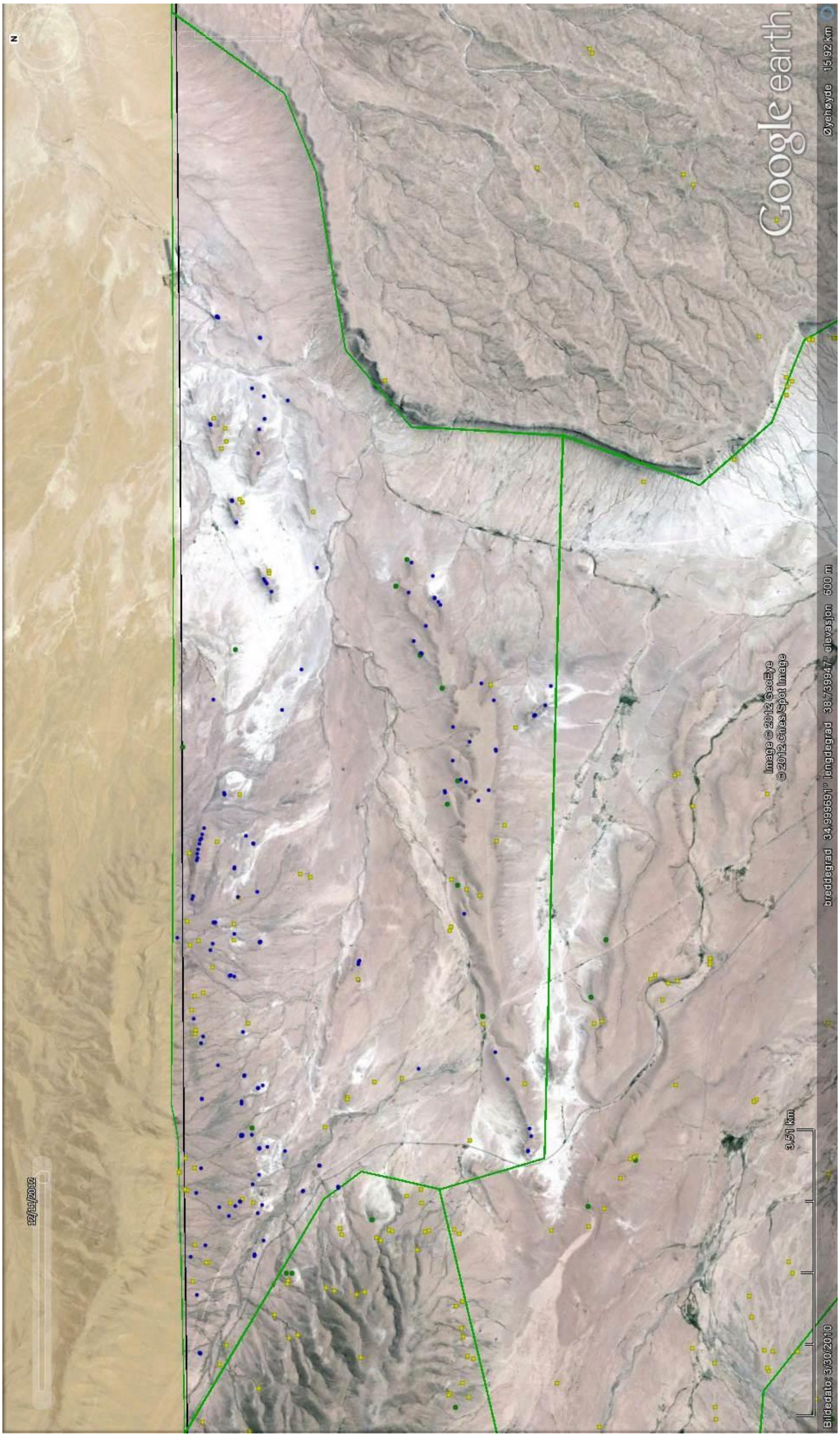


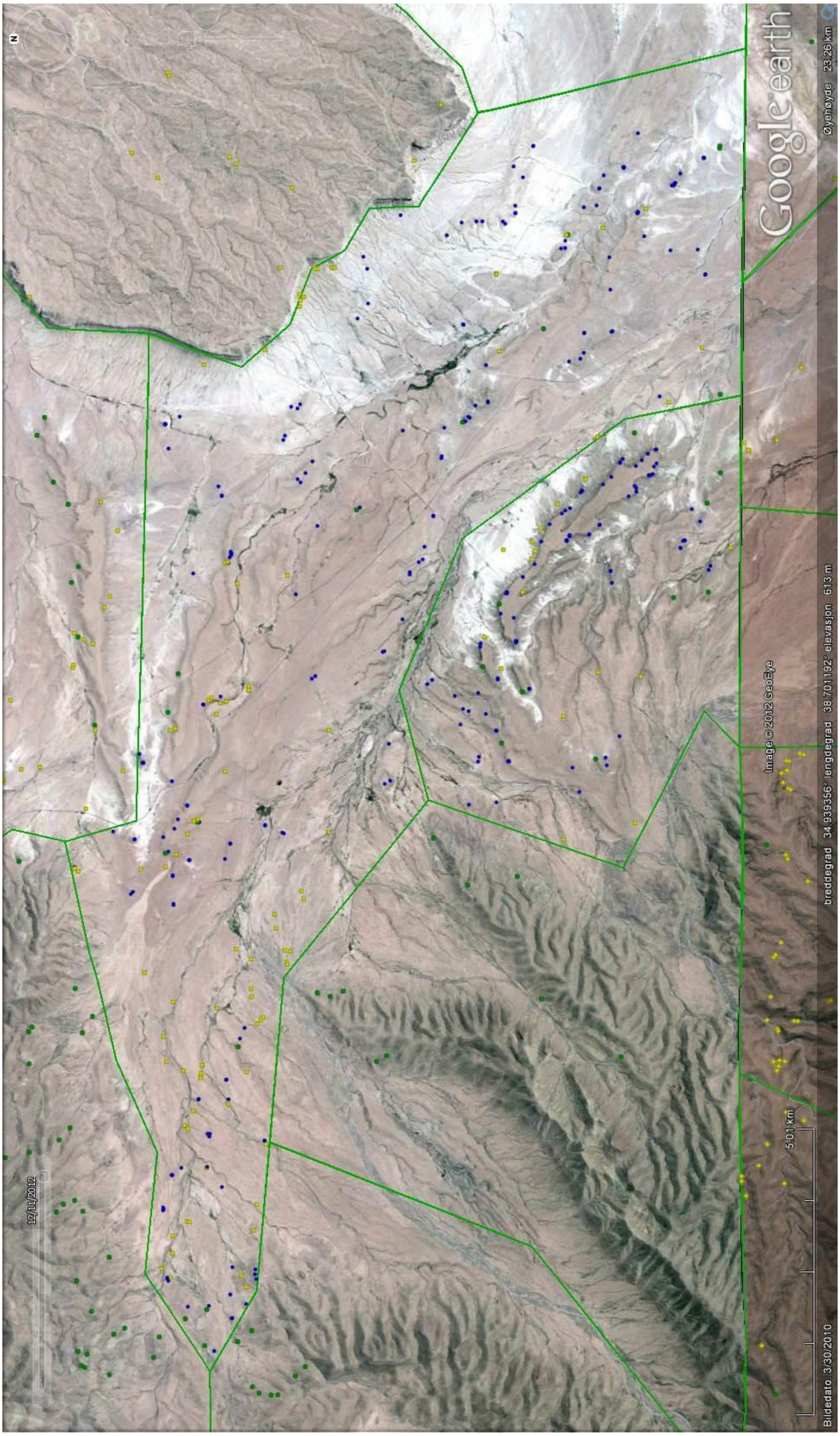
51
50
48
47
49
46
© 2012 Cnes/Spot Image
Image © 2012 GeoEye
breddegrad 34.933231° lengdegrad 39.103159° elevasjon 427 m
Google earth
Øyehøyde 32.91 km
Bildedato 9/5/2010
11/21/2012
7.49 km



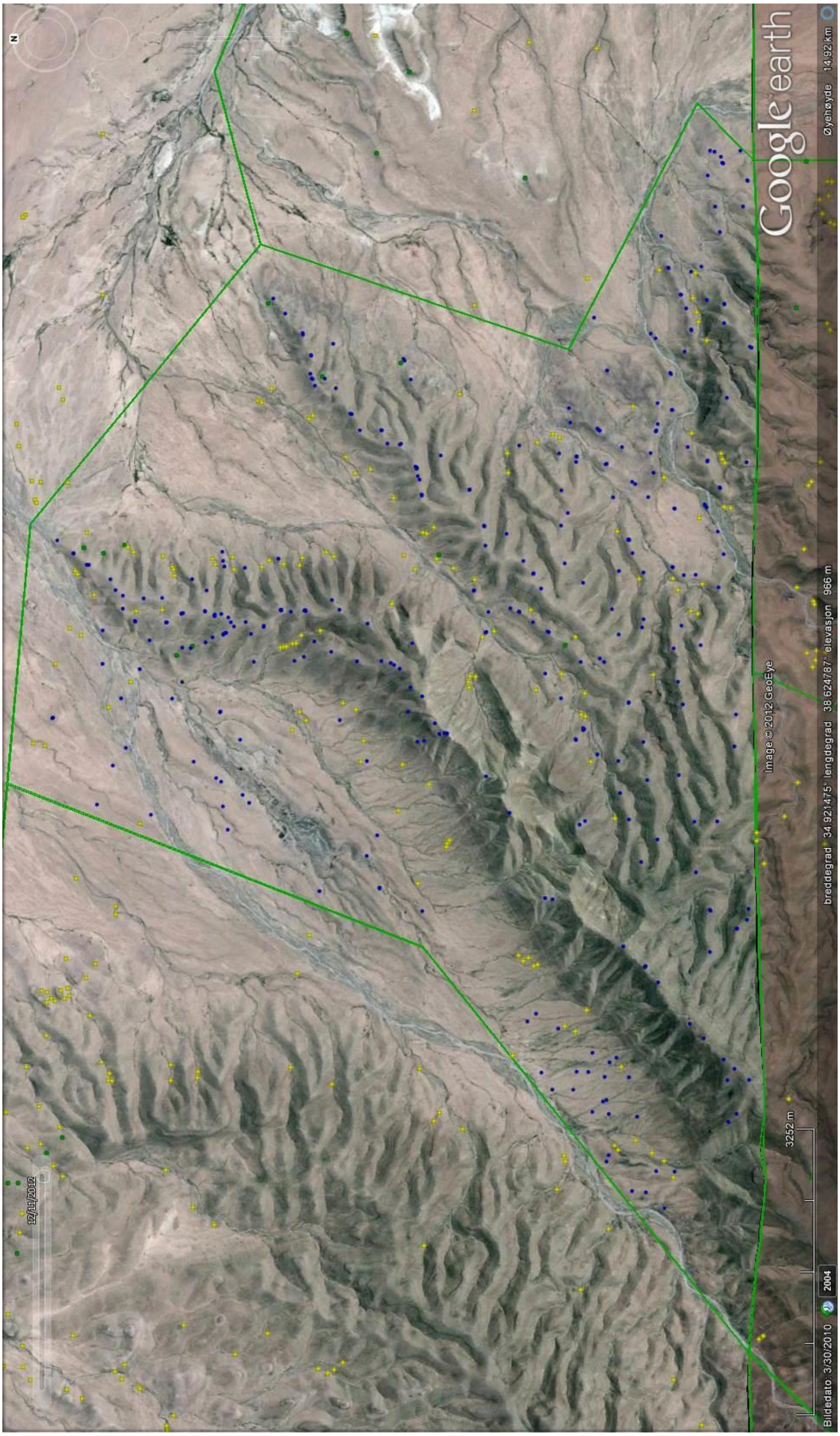
Soukhne
Image © 2012 GeoEye
Google earth
Øyehøyde 17,79 km
4,01 km
12/11/2012
Bildedato 9/5/2010

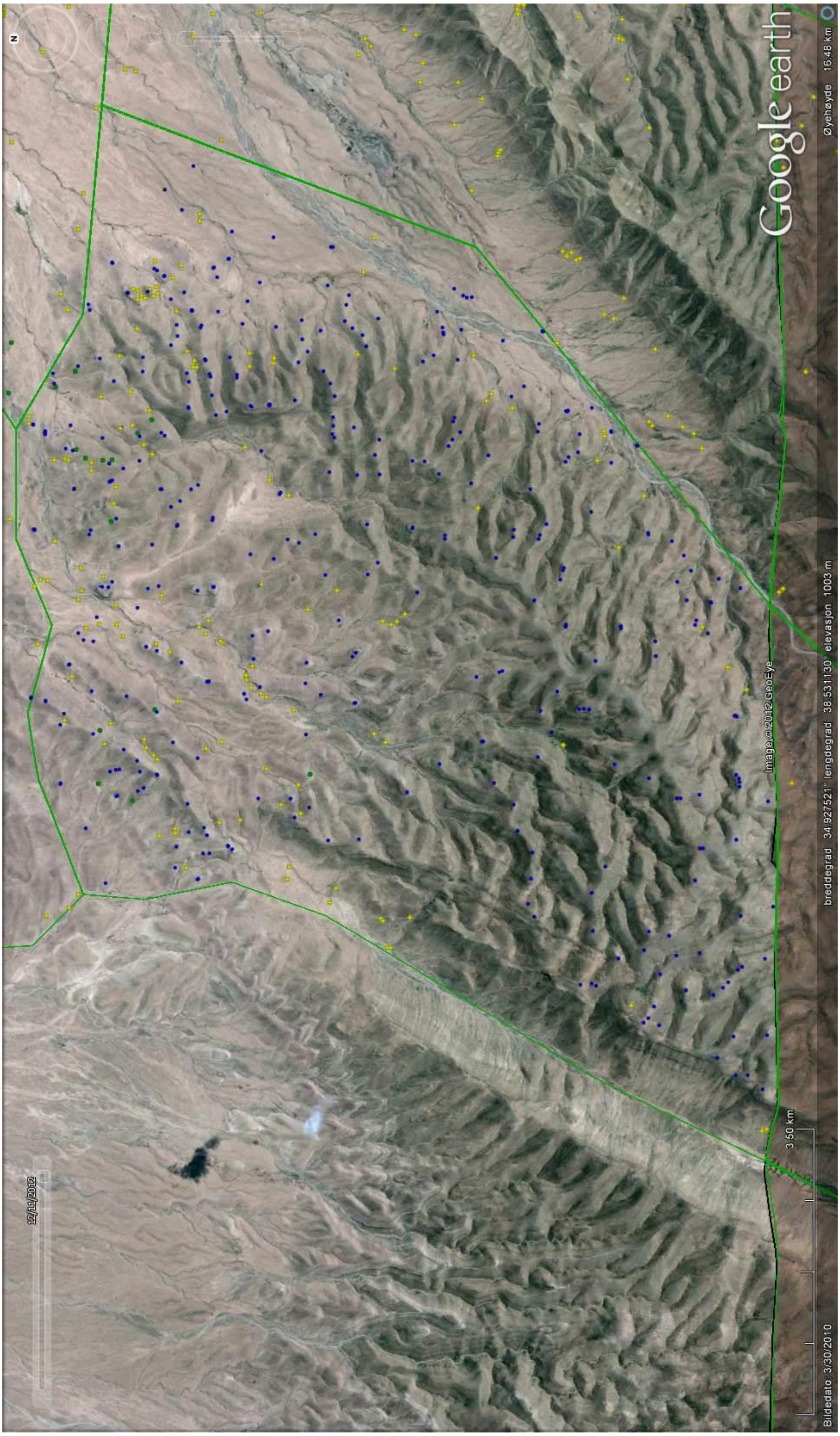

Google earth
Image © 2012 GeoEye
© 2012 Cnes/Spot Image

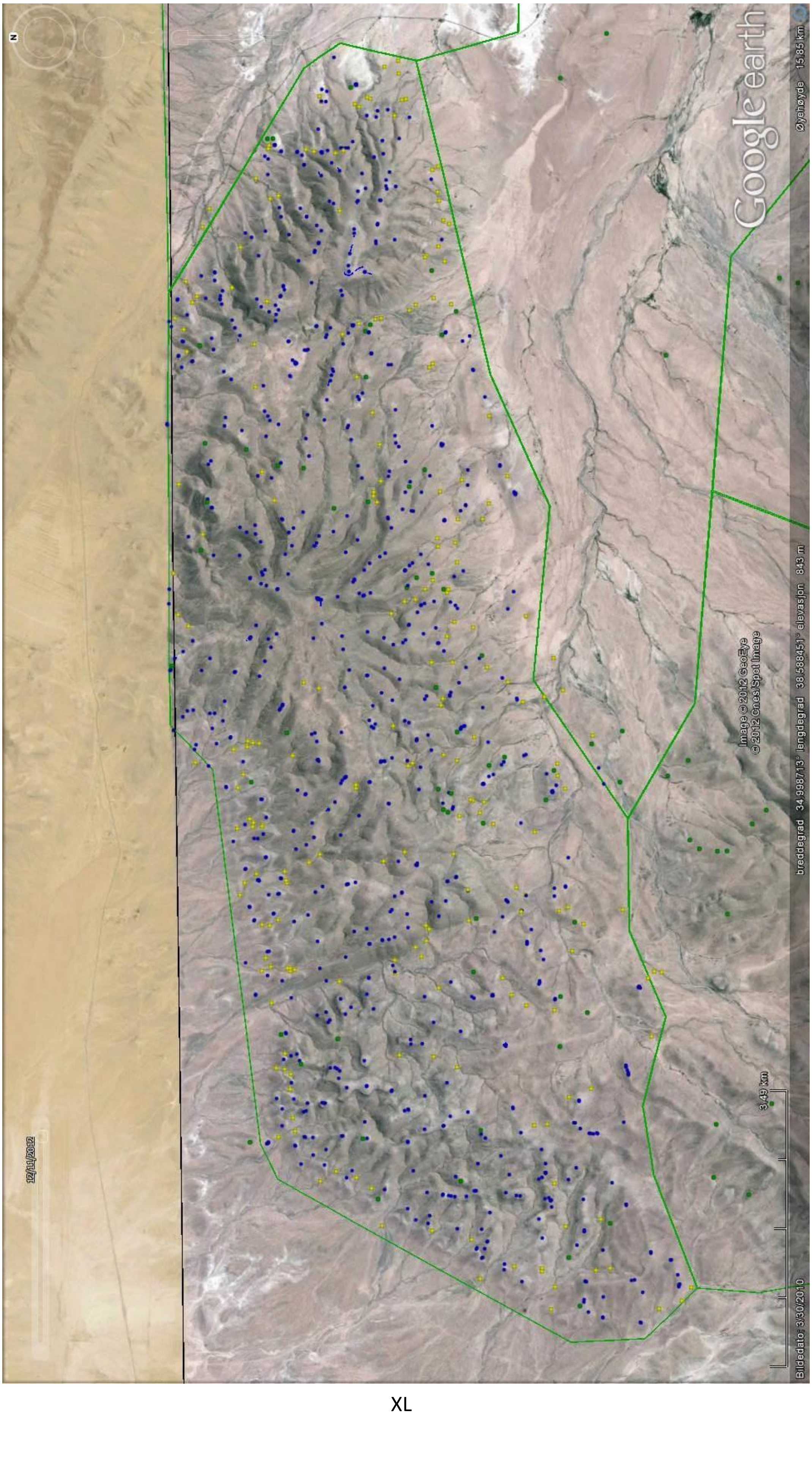

Google earth
Image © 2012 GeoEye
© 2012 Cnes/Spot Image
breddegrad 34.999691° lengdegrad 38.739947° elevasjon 600 m
Øyehøyde 15.92 km
Bildedato: 3/30/2010
12/11/2012
3.51 Km
N



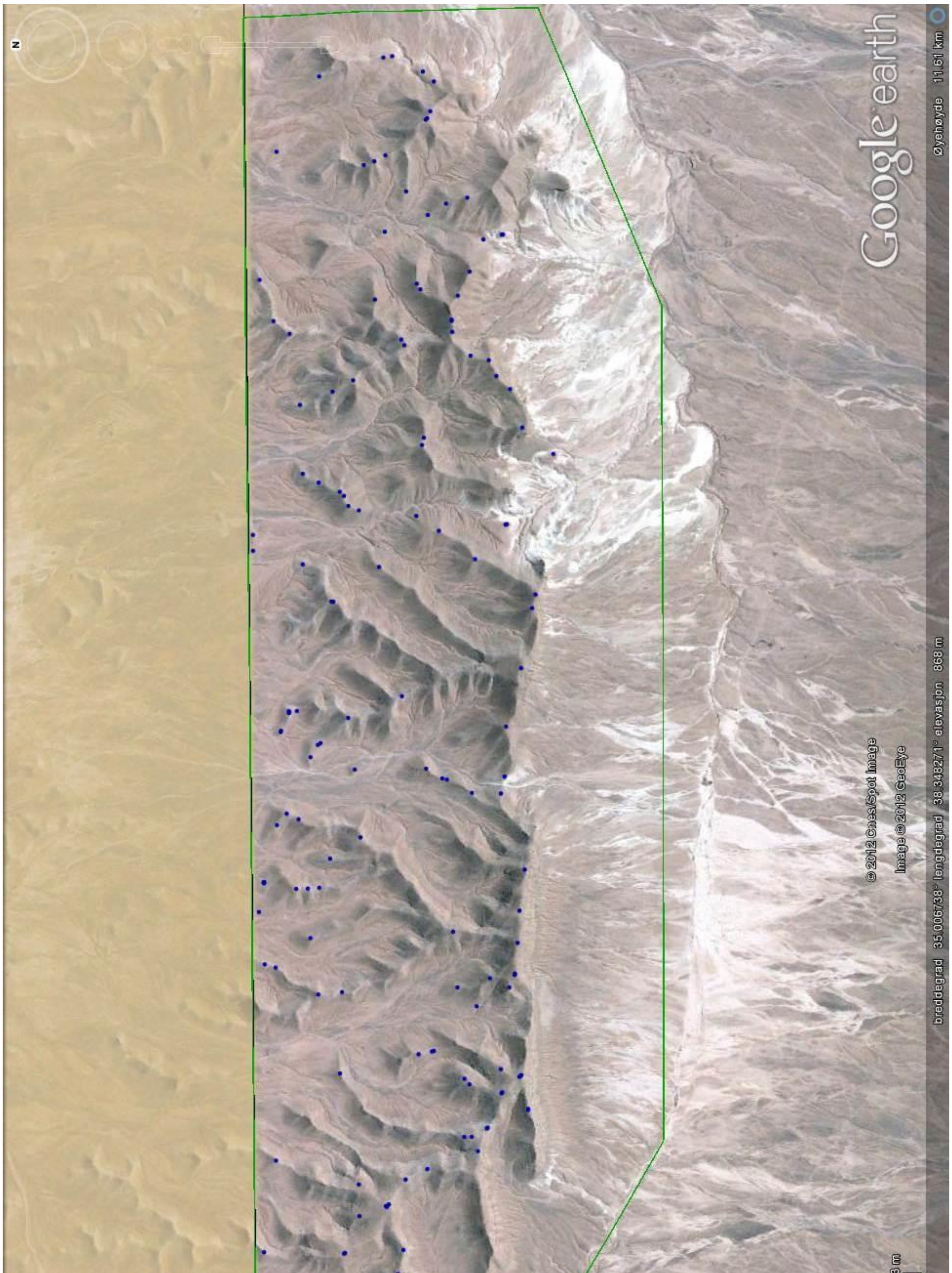
Google earth
Image © 2012 GeoEye
Bildedato: 3/30/2010
breddegrad 34.939356° lengdegrad 38.701192° elevasjon 613 m
Øyehøyde 23.26 km
5.01 km
12/11/2012


Google earth
Image © 2012 GeoEye
breddegrad 34.921475° lengdegrad 38.624787° elevasjon 966 m
Øyehøyde 14.92 km
Bildedato: 3/30/2010
2004
3252 m
12/11/2012
N

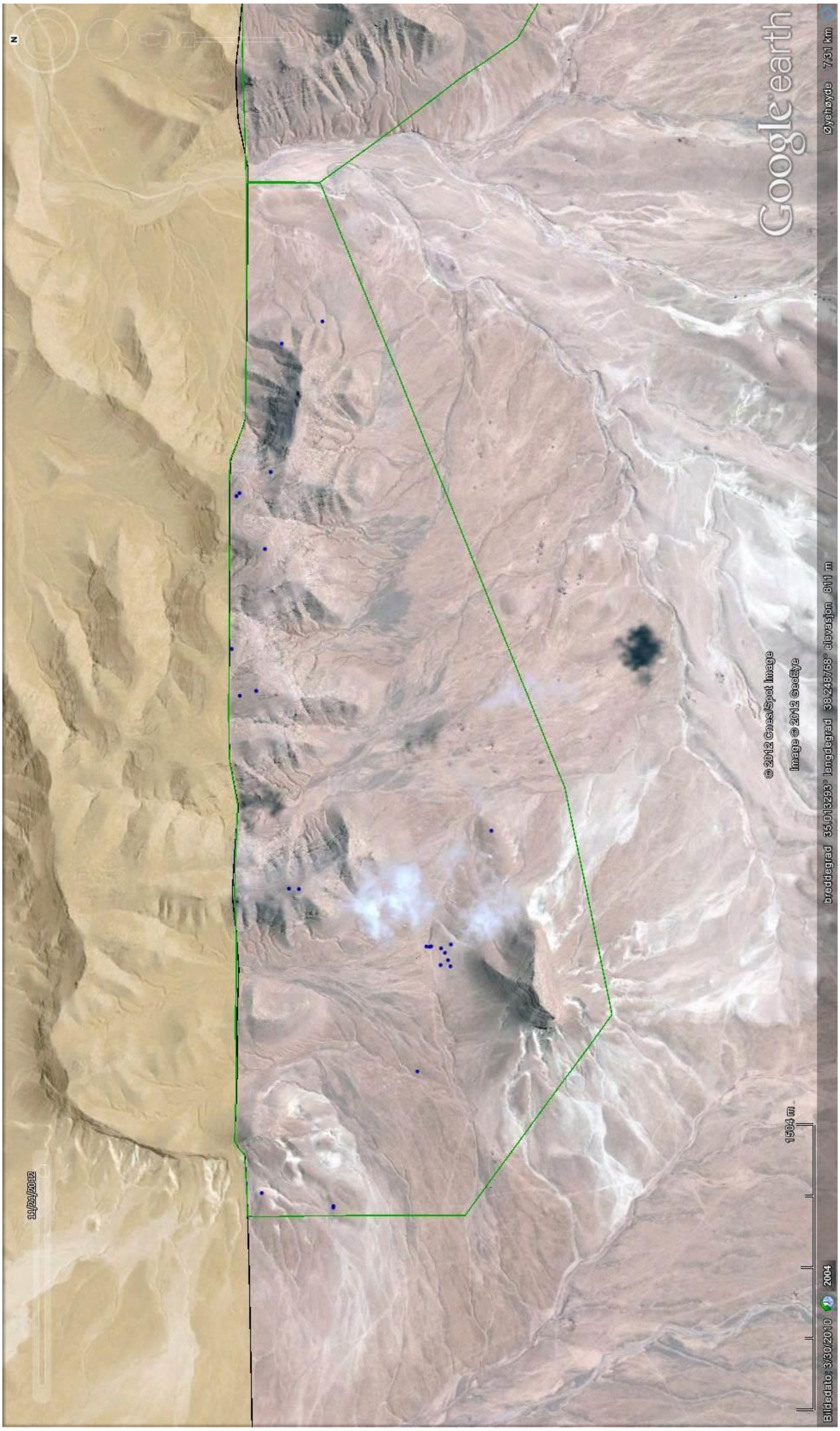

Google earth
Øyehøyde 16.48 km
breddegrad 34.927521° lengdegrad 38.531130° elevasjon 1003 m
Image © 2012 GeoEye
3.50 km
Bildedato 3/30/2010
12/11/2012


Google earth
Image © 2012 GeoEye
© 2012 Cnes/Spot Image
breddegrad 34.9987713° lengdegrad 38.588451° elevasjon 843 m
Øyehøyde 15.85 km
Bildedato: 3/30/2010
3.49 km
12/14/2012

XL



Google earth
Øyenøyde 11.61 km
© 2012 Cnes/Spot Image
Image © 2012 GeoEye
breddegrad 35.006738° lengdegrad 38.348271° elevasjon 868 m
2503 m
Bildedato: 3/30/2010
2004
11/21/2012



© 2012 Cnes/Spot Image
Image © 2012 GeoEye
breddegrad 35.013293° lengdegrad 38.248768° elevasjon 811 m
Øyehøyde 7.31 km
Google earth
Bildedato: 3/30/2010
2004
1504 m
11/24/2012
N

**ERRATA**

*(Pg. = Page, § = paragraph, → = should be)*

Pg. viii, line 1: Pastoral herd → Herd on pasture

Pg. 1, §4, line 7: as tower-like → tower-like

Pg. 2, §1, line 5: publications was and is → publications were and are

Pg. 2, §1, line 8: when is grew → when it grew

Pg. 4, §2, line 5: this has changed in during → this has changed in

Pg. 4, §2, line 5: and its → and their

Pg. 4, §2, line 8: question here concers → question here concerns

Pg. 5, §1, line 1: mobil pastoralism → mobile pastoralism

Pg. 5, §1, line 6: mobile grups → mobile groups

Pg. 5, §1, line 7: mainly through pasturing → mainly through the pasturing

Pg. 5, §2, line 2: will widen → will be widened

Pg. 6, §2, line 3: in many of which → many in which

Pg. 6, §3, line 6: provided it → provided they

Pg. 6, §3, line 8: relevany → relevant

Pg. 7, §1, line 1: Amorite → Amorrite

Pg. 7, §1, line 5: whether it refer → whether it refers

Pg. 7, §2, line 8: in all context → in all contexts

Pg. 8, §1, line 2: matters is → matters are

Pg. 8, §1, line 3: land use of → land use in

Pg. 9, §2, line 3: (cf. 0) → (cf. 1.2.1)

Pg. 9, §4, line 3: as follows:1) → As follows: 1)

Pg. 10, §1, line 11: basis such questions → basis of such questions

Pg. 10, §2, line 4: show the specific → show how the specific

Pg. 14, §1, line 7: the region been → the region was

Pg. 14, §1, line 14: powerful dynamic → powerful dynamic force

Pg. 14, §2, line 6: joined on its right → joined on its left

Pg. 15, §1, line 6: lay dry → lie dry

Pg. 16, §1, line 8: scattered around in the → scattered around the

Pg. 17, §1, line 1: utilizing → utilising

Pg. 18, §1, line 2: as for certain → as of certain

Pg. 19, §2, line 12: character its summers → character of its summers

Pg. 20, §1, line 7: Palmyrene, than is the case → Palmyrene than the case is

Pg. 20, §1, line 13: consequently partially covering → which consequently partially covered

Pg. 22, §2, line 6: needed to barley → needed to grow barley

Pg. 27, §3, line 13: fauna have → fauna has

Pg. 28, §2, line 6: while the Euphrates → while in the Euphrates

Pg. 32, §1, line 4: surge of integrationof → surge in the integration of

Pg. 35, §2, line 2: It also received → It also receives

Pg. 36, §2, line 12: which h they → which they

Pg. 40, §1, line 12: regime, than → regime than

Pg. 43, §1, line 2: and increase → and an increase

Pg. 46, §1, line 12: its interplay with other atmospheric processes could have → the interplay with other atmospheric processes could have had

Pg. 47, §1, line 21: same time less seasonal → same time turning less seasonal

Pg. 48: The entire page has been moved from pg. 55, resulting in the corresponding errata that fig 2.14 and 2.15 have switched reference numbers.

Pg. 48, §1, line 3: the complexity if these → the complexity of these

Pg. 50, §3, line 2: - is another issue → – is another issue

Pg. 51, §1, line 2: as high resolution site → as a high-resolution site

Pg. 53, §2, line 11: was correlated → were correlated

Pg. 54, §2, line 8: that climate returned → that the climate returned

Pg. 54, §2, line 23: that there decreases → that decreases

Pg. 57, §2, line 19: does indicate forests → does indicate that forests

Pg. 71, §1, line 8: (cf. 4.5.5) for a discussion → (cf. 4.5.5 for a discussion

Pg. 76, §2, line 4: and argue → and I will argue

Pg. 77, Figure 3.1, line 6: Sinjar as Saggar → Sinjar was known as Saggar

Pg. 80, §1, line 7: can all fit scenarios → can fit all scenarios

Pg. 83, §1, line 7: fact have been → fact has been

Pg. 86, §3, line 5: was been left out → has been left out

Pg. 89, §1, line 9: has been published → was published

Pg. 89, §2, line 1: (cf. 0) → (cf. 1.2.1)

Pg. 89, §2, line 6: Amorite → Amorrite

Pg. 90, §1, line 7: are highly significant → is highly significant

Pg. 90, §2, line 12: vast bureaucratic need → vast bureaucracy

Pg. 91, §1, line 1: referring to both the pastoralist economy of the ancient town and suggestive → referring to the pastoralist economy of the ancient town and are suggestive

Pg. 91, §2, line 14: hiatus a smaller collection have → hiatus, a smaller collection has

Pg. 91, §2, line 16: the Mari archives is → the Mari archives are

Pg. 91, §2, line 19: Mari texts and → Mari texts

Pg. 95, §2, line 5: Amorite components → Amorrite components

Pg. 95, §2, line 5: become common → became common

Pg. 97, §1, line 2: which comprise → which comprises

Pg. 100, §2, line 5: Amorite chiefs → Amorrite chiefs

Pg. 103, §1, line 12: void of → devoid of

Pg. 105, §1, line 1: an Amorite dynasty → an Amorrite dynasty

Pg. 111, §1, line 9: Yamhad, was married → Yamhad and was married

Pg. 115, §1, line 2: the region has → the region have

Pg. 115, §1, line 14: mobile groups has been → mobile groups have been

Pg. 115, §1, line 15-16: bechronologically → be chronologically

Pg. 116, §2, line 5: the monuments varies → the monuments vary

Pg. 118, §1, line 8: the Palmyrena project suffer → the Palmyrena project suffers

Pg. 120, §3, line 1: has indeed → have indeed

Pg. 144, §3, line 9: spurs and → spurs, and

Pg. 147, §3, line 2: actually are → actually being

Pg. 147, §3, line 6: still incorporate → still incorporates

Pg. 151, §1, line 5: steppe –stone → steppe – stone

Pg. 160, §2, line 2: can and in effect also *was* → can be and in effect also *were*

Pg. 160, §2, line 3: has been presented → have been presented

Pg. 164, §2, line 3: - are more → – are more

Pg. 166, Note 12, line 6: with tumuli called → with tumuli is called

Pg. 167, §1, line 1: having relatively → having a relatively

Pg. 167, §1, line 2: known routes and local natural → its known routes, and its local natural

Pg. 167, Note 13, line 2: Soukhne → Suhne

Pg. 170, §1, line 6: **Figure 4.27Feil! Fant ikke referansekilden.** → **Figure 4.27**

Pg. 170, Figure 4.28, line 5: photo - along → photo – along

Pg. 178, Figure 4.32, line 4: slopes and small wadis → slopes, and small wadis

Pg. 185, §1, line 10: developments or external → developments, or external

Pg. 192, §3, line 10: Hassie and Homs → Hassie, and Homs

Pg. 194, §1, line 1: Palmyreneen → Palmyrene

Pg. 195, §1, line 1: this study– → this study –

Pg. 197, §1, line 21: very few of this → very few examples of this

Pg. 198, §1, line 16: south of the al-Assad lake → south of Lake Assad

Pg. 199, §2, line 3: was probably → were probably

Pg. 199, §4, line 5: trapezoidal and axe-shaped → trapezoidal, and axe-shaped

Pg. 202, §1, line 11: conceivalble → conceivable

Pg. 206, Figure 4.49, line 2: there was → there were

Pg. 210, §1, line 4: as platform s → such as platforms

Pg. 210, §1, line 12: exposure, and → exposure and

Pg. 213, §1, line 6: to single-aliquot → to the single-aliquot

Pg. 213, §1, line 8: bleaching or → bleaching, or

Pg. 214, §2, line 6: yield for → yield

Pg. 214, §2, line 8: material and → material

Pg. 217, §1, line 2: surveys in → surveys from

Pg. 217, §1, line 10: shaft-tombs or cists tombs → shaft tombs or cist tombs

Pg. 219, §1, line 4: attribute → attributed

Pg. 220, §1, line 16: which is containing → which contains

Pg. 222, §1, line 1: was attributed → were attributed

Pg. 223, §4, line 3: do in fact have → do have

Pg. 223, §4, line 8: group or → group, or

Pg. 224, §2, line 5: structures or → structures, or

Pg. 226, Figure 4.58, line 4: same pattern → same result

Pg. 227, §1, line 5: stretches → stretches

Pg. 228, §1, line 8: suggest a → suggest

Pg. 229, §1, line 22: material or → material, or

Pg. 229, §1, line 25: construction and → construction, and

Pg. 234, §2, line 8: high carrying → high-carrying

Pg. 235, §1, line 3: did certainly → certainly did

Pg. 235, §1, line 19: sedenterised → sedentarised

Pg. 235, §1, line 27: comes → come

Pg. 237, §4, line 8: characterizing → characterising

Pg. 238, §2, line 2: current → the current

Pg. 238, §3, line 11: the mobile life → the mobile lifestyle

Pg. 240, §2, line 3: middle range → middle-range

Pg. 245, §1, line 24: allocation is → allocation are

Pg. 247, §1, line 3: well be → well have been

Pg. 254, §2, line 6: **Feil! Fant ikke referansekilden. → Figure 5.3**

Pg. 254, §2, line 7: haracterised → characterised

Pg. 254, §2, line 16: inJebel → in Jebel

Pg. 255, Figure 5.5, line 1: land-use → land use

Pg. 259, §2, line 2-3: views were sometimes been put forward, such as these ones → views such as these ones were sometimes put forward

Pg. 259, §4, line 1: probably has been → probably have been

Pg. 259, §4, line 4: low-lever → low-level

Pg. 259, §4, line 13: sets in → set in

Pg. 260, §1, line 29: the as a raiding mechanism → raiding as a procurement mechanism

Pg. 261, §1, line 5: there is → there are

Pg. 271, §5, line 3: to this → to

Pg. 282, §1, line 27: this → the latter

Pg. 284, §1, line 21: storage → store

Pg. 285, §2, line 6: this → in this

Pg. 285, Text 5.15, line 1: lord → Lord

Pg. 290, §2, line 9: portrays → portray

Pg. 294, §2, line 10: can → can put

Pg. 308, §1, line 29: which it → which they

Pg. 316, Figure 5.12, line 5: Talhaym → Talhayum

Pg. 317, Figure 5.13, line 1: Tribal competition → While tribal competition

Pg. 318, §1, line 8: **5.11Feil! Fant ikke referansekilden. → 5.11**

Pg. 319, §1, line 6: the only → the only other

Pg. 319, §2, line 15: lead → led

Pg. 323, §1, line 7: is outdated → are outdated

Pg. 325, §3, line 4: internment → interment

Pg. 330, §1, line 11: summarized → summarised

Pg. 331, §1, line 6: summarized →summarised

Pg. 334, §2, line 7: convincinly → convincingly

Pg. 335, §1, line 9: lead → led

Pg. 336, §2, line 12: stress, could → stress could

Pg. 338, §2, line 7: advantageous climtaes → advantageous climates

Pg. 340, §2, line 8: The end commodity → The end commodities

Pg. 341, §2, line 10: Then, there → Then there

Pg. 341, §2, line 20: by mobil pastoralists → by mobile pastoralists

Pg. 342, §1, line 7: resource → resource

Pg. 342, §1, line 20: is uncertain → are uncertain

Pg. 342, §2, line 1: which is represented → which are represented

Pg. 342, §2, line 3: also be means → also by means

Pg. 343, §1, line 13: do → does

Pg. 344, §2, line 14: archeology → archaeology

Pg. 345, §1, 6: (Kennedy 2011) → (Kennedy & Bishop 2011)

Pg. 351, missing reference: Deadman, W. M. (2012). Defining the Early Bronze Age landscape: a remote sensing-based analysis of Hafit tomb distribution in Wadi Andam, Sultanate of Oman. *Arabian Archaeology and Epigraphy* 23, pp. 26-34.