

ABSTRACT

HUNTER, FRANCES STALLINGS. A Synthesis of Three Surface Surveys in Central Jordan and an Interpretation of Increased Settlement and Land Use in the Late Byzantine Era. (Under the direction of committee chair Dr. S. Thomas Parker.)

The Middle East in the Byzantine period is one of the least analyzed historic periods. Scholars assumed that this was a time of turmoil and unrest when people moved away from the frontiers Rome had previously controlled. New archaeological work is forming contrasting ideas. Evidence from three surface surveys by Burton MacDonald conducted in central and western Jordan, question former ideas of abatement. This thesis will begin with a historical narrative of the ancient Middle East from the Bronze through the Byzantine periods before discussing the surveys. Surface surveys, by nature, are less intensive than excavations because they only analyze surface evidence. These surveys, *the Wadi el Hasā Survey*, *the Southern Ghors and Northeast Arabah Survey* and *the Tafila-Busayra Survey* produced the first occupational evidence for the contiguous 2, 000 square kilometer area south of Wadi el Hasā. The geology, topography and climate of this area were important factors in land use, so each of these will be discussed relative to ancient land use. Primary sources provide information about this area, its inhabitants, settlement and land use of the region. Diodorus and Strabo are particularly informative. Secondary sources include ancient Middle East scholars Devin Butcher, G. W. Bowersock, Jodi Magness and S Thomas Parker. Methodology will lead discussions of data for each survey. Dates of ceramic artifacts from these surveys establish patterns and shifts in settlement. Parallels for pottery by A.D. Tushingham's work in Dibon and J.W.Hayes's *Late Roman Pottery* provide dating information for these ceramics. Stores of papyri found both in Nessana and Petra will be discussed in conjunction with archaeological evidence. Excavation work in surrounding

areas aid in reconstructing Byzantine sedentarization, as central and western Jordan was interconnected with these areas in ancient times. Archaeological excavations by Colt and Urman in the Negev, S. Thomas Parker's work at Lejjūn and Aila and several excavations in and around Petra will be used to compare settlement and land use in these related areas. Using the three surveys, excavation evidence from the Negev, Petra and nearby areas and support from ancient papyri, this thesis will argue for increased settlement and agricultural land use in this area of Jordan during the Byzantine Era. As a postscript, this thesis will offer thoughts about the implication of the surveys on future archaeological work in central Jordan.

A Synthesis of Three Surface Surveys in Jordan and an Interpretation of Increased Settlement
and Land Use in the Late Byzantine Era

by
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DEDICATION

For my mother

The first historian I ever knew

Ann Ware Stallings

(1936-1996)

BIOGRAPHY

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TABLE OF CONTENTS

LIST OF TABLES	vii
LIST OF FIGURES	viii
LIST OF PHOTOGRAPHS	xi
CHAPTER 1	1
A. Introduction	1
B. History – Intensification and Abatement.....	5
C. Overview of Surveys and Methods	18
I. History of Exploration.....	18
II. Wadi el Hasā Survey	22
III. Southern Ghors and Northeast Arabah Survey	25
IV. Tafila-Busayra Survey.....	27
D. Topography, Geography and Climate	33
E. Primary Sources.....	40
F. Secondary Sources.....	44
CHAPTER 2.....	47
A. Wadi el Hasā.....	47
I. Methods	47
II. Evidence	53
a. WHS Central and Eastern Universes.....	59
b. WHS Western Universe	62
B. Southern Ghors and Northeast Arabah.....	65
I. Methods	65
II. Evidence	68
C. Tafila-Busayra	77
I. Methods	77
II. Evidence	84

CHAPTER 3	96
A. Further Research.....	97
I. Pottery.....	97
II. Watermills and Grinding Stones in WHS	110
III. Mills and Grinding Stones.....	116
a. SGNAS.....	116
b. TBAS.....	118
B. Further Evidence	121
I. Negev.....	122
a. Nessana Papyri	122
b. Excavations in the Negev	126
II. Petra.....	130
a. Petra Papyri	130
b. Petra Archaeology	132
III. Limes Arabicus Project	134
IV. Aila	135
V. Archaeological Work in the Region after MacDonald.....	136
C. Synthesis and Conclusion.....	138
I. Synthesis of Information	138
II. Future Work.....	140
PHOTOGRAPHS	143
BIBLIOGRAPHY	152

LIST OF TABLES

Table 1.	Wadi el Hasā Sites by Period	57
Table 2.	WHS Site Types	58
Table 3.	WHS Sherd Count	58
Table 4.	SGNAS Sites by Period.....	74
Table 5.	SGNAS Site Types	75
Table 6.	SGNAS Sherd Count.....	76
Table 7.	TBAS Sites by Period.....	95
Table 8.	TBAS Site Types	95
Table 9.	WHS Sherds per Mill Site per Era	115

LIST OF FIGURES

Figure 1.	The Ancient Middle East..... “Map of Arabia” <i>Roman Arabia</i> , G. W. Bowersock, (Cambridge: Harvard University Press, 1983), facing 1	1
Figure 2.	The Three Survey Areas Combined “The Roman Frontier East of the Dead Sea” <i>Roman Frontier in Central Jordan</i> , S. Thomas Parker, (Washington DC: Dumbarton Oaks, 2006), 23	4
Figure 3.	The Wadi el Hasā Survey Region “General Map of WHS Area” <i>The Wadi el Hasāa Archaeological Survey</i> , Burton MacDonald, (Ontario: Wilfrid Laurier University Press, 1988), 2.	24
Figure 4.	The Southern Ghors and Northeast Arabah Survey Region..... “Southern Ghors and Northeast Arabah Archaeological Survey Territory” <i>The Southern Ghors and Northeast Arabah Archaeological Survey</i> , Burton MacDonald, (Sheffield, England: J.R. Collis Publications, 1992), 2.	26
Figure 5.	Tafila-Busayra Survey Region “General map of WHS Area” <i>WHS</i> , 3.	29
Figure 6.	Geological Map of Wadi el Hasā, Southern Ghors And NE Arabah “Geological Map of WHS” <i>WHS</i> , 28.	33
Figure 7.	Geological Map of Tafila-Busayra “Geological Map of Tafila-Busayra” <i>Tafila-Busayra Archaeological Survey</i> , Burton MacDonald, (Boston: American Schools of Oriental research, 2004), 21	35
Figure 8.	Wadi el Hasā Survey Universes “General Map of WHS Area” <i>WHS</i> , 3.	48
Figure 9.	WHS Western Universe, Pedestrian Transects “West Universe transects” <i>WHS</i> , 14.	50

Figure 10.	WHS Eastern Universe, Pedestrian Transects..... “East Universe quadrats” <i>WHS</i> , 16.	52
Figure 11.	WHS, Central and Eastern Universes, Byzantine Sites..... “Byzantine/Islamic Site Map” <i>WHS</i> , 239.	61
Figure 12.	WHS, Western Universe, Byzantine Sites “Byzantine/Islamic Site Map” <i>WHS</i> , 239.	64
Figure 13.	SGNAS Region “SGNAS Territory” <i>SGNAS</i> , 2.	67
Figure 14.	Tafila-Busayra Archaeological Survey Region..... “General Map of WHS Area” <i>WHS</i> , 3.	77
Figure 15.	TBAS Zones “Locations of via nova Traiana” <i>TBAS</i> , 5.	78
Figure 16.	TBAS Random Squares..... “TBAS Territory and Topographical Zones” <i>TBAS</i> , 3.	79
Figure 17.	Busayra Random Squares..... “Zone Busayra” <i>TBAS</i> , 4.	80
Figure 18.	Site Global Interpolation, Power 1 “Site Global Interpolation Power 1” <i>TBAS</i> , 68.	82
Figure 19.	Site Local Interpolation, Power 4..... “Site Local Interpolation, Power 4” <i>TBAS</i> , 70.	82
Figure 20.	Random Square Pottery Global Interpolation, Power 1 “Random Square Pottery Global Interpolation, Power 1” <i>TBAS</i> , 72.	83
Figure 21.	Random Square Pottery Local Interpolation, Power 4..... “Random Square Pottery Local Interpolation, Power 4” <i>TBAS</i> , 72.	83
Figure 22.	TBAS Sites “All Site of TBAS” <i>TBAS</i> , 5.	85
Figure 23.	WHS Approximate Western Universe “General Map of WHS” <i>WHS</i> , 3.	99

Figure 24.	Byzantine Sites with Published Pottery, Western Universe..... “WHS Byzantine Map” <i>WHS</i> , 239.	103
Figure 25 a-b.	WHs Site 23 and Tushingam Pottery	104
Figure 26 a-b.	WHS Site 172 and Tushingam Pottery.....	105
Figure 27 a-b.	WHS Site 223 and Tushingam Pottery.....	106
Figure 28 a-b.	WHS Site 1, Site 6 and Hayes Pottery	107
Figure 29 a-b.	WHS Site 6 and Tushingam Pottery.....	108
Figure 30 a-b.	WHS Site 6 and Tushingam Pottery.....	109
Figure 31.	WHS Byzantine Sites with Mills..... “WHS Byzantine Map” <i>WHS</i> , 239.	114
Figure 32.	SGNAS Byzantine Sites with Mills	117
	“SGNAS Byzantine Settlement Pattern Map” <i>SGNAS</i> , 98-9.	
Figure 33.	TBAS Byzantine Sites with Mills	119
	“TBAS Byzantine Period Sites” <i>TBAS</i> , 61.	
Figure 34.	Negev Towns.....	130
	“Northern Sector of the Arabian frontier in northeast Jordan” S. Thomas Parker, <i>Romans and Saracens: A History of the Arabian Frontier</i> (Winona Lake, IN: Eisenbrauns, 1986), 7.	
Figure 35.	Roman Roads.....	142
	S. Thomas Parker, “Figure 71-Petra: Part 5: Syria-Meroe” And “Petra, Syria-Meroe”, <i>Atlas of the Greek and Roman World</i> , Richard J.A. Talbert, ed. (Princeton: Princeton University Press, 2000).	

LIST OF PHOTOGRAPHS

Photo 1.	Wadi Ahmar; looking north, WHS From <i>Wadi el Hasā Archaeological Survey</i> , 141	143
Photo 2.	Plateau in western universe; looking north, WHS From <i>Wadi el Hasā Archaeological Survey</i> , 141	143
Photo 3.	Site 23, Mashmil/El Mushimmin, WHS From <i>Wadi el Hasā Archaeological Survey</i> , 144	144
Photo 4.	Wadi el 'Alī, from Site 616, WHS From <i>Wadi el Hasā Archaeological Survey</i> , 140	144
Photo 5.	Site 75, ancient Feifa, SGNAS From <i>Southern Ghors and Northeast Arabah Archaeological Survey</i> , 164.....	145
Photo 6.	Site 108, Rujjm Khumeizir, SGNAS From <i>Southern Ghors and Northeast Arabah Archaeological Survey</i> , 164.....	145
Photo 7.	Structures at Site 141, SGNAS From <i>Southern Ghors and Northeast Arabah Archaeological Survey</i> , 167.....	146
Photo 8.	Site 77, aqueduct, milling SGNAS From <i>Southern Ghors and Northeast Arabah Archaeological Survey</i> , 167.....	146
Photo 9.	Site 46, Deir 'Ain 'Abata, SGNAS From <i>Southern Ghors and Northeast Arabah Archaeological Survey</i> , 171.....	147
Photo 10.	Arches at Site 46, Deir 'Ain 'Abata, SGNAS From <i>Southern Ghors and Northeast Arabah Archaeological Survey</i> , 171.....	147

Photo 11.	Site 240, stone enclosure, SGNAS From <i>Southern Ghors and Northeast Arabah Archaeological Survey</i> , 178.....	148
Photo 12.	Site 112, aqueduct, SGNAS From <i>Southern Ghors and Northeast Arabah Archaeological Survey</i> , 178.....	148
Photo 13.	Busayra looking southwest, TBAS From <i>Tafila-Busayra Archaeological Survey</i> , 129.....	149
Photo 14.	Milling Stone, TBAS From <i>Tafila-Busayra Archaeological Survey</i> , 196.....	149
Photo 15.	Olive Press, TBAS From <i>Tafila-Busayra Archaeological Survey</i> , 283.....	150
Photo 16.	Milestone along Hajj Route, TBAS From <i>Tafila-Busayra Archaeological Survey</i> , 385.....	150
Photo 17.	Cistern at Khirbat Masala, TBAS From <i>Tafila-Busayra Archaeological Survey</i> , 295.....	151
Photo 18.	Cistern, TBAS From <i>Tafila-Busayra Archaeological Survey</i> , 295.....	151

CHAPTER 1

A. INTRODUCTION

Understanding land use and settlement in the Middle East has been problematic for scholars due, in part, to the lack of published and available archaeological evidence. The land of modern day Jordan, in particular, includes many areas which have not been excavated. Without a synthesis of strong archaeological evidence, a realistic

interpretation of settlement patterns cannot be constructed for this land. It has been advocated that periods of more intensive settlement alternated with periods of abatement in settlement. However, archaeological data from many areas has not been synthesized and decisively evaluated to analyze this pattern. The late Byzantine Era, from the 6th through the early 7th centuries, is one of the least

known periods, but is regarded as a period of abatement of settlement.¹ This is particularly true of the area of Jordan which constituted the frontier and desert fringes. This thesis will synthesize and analyze three

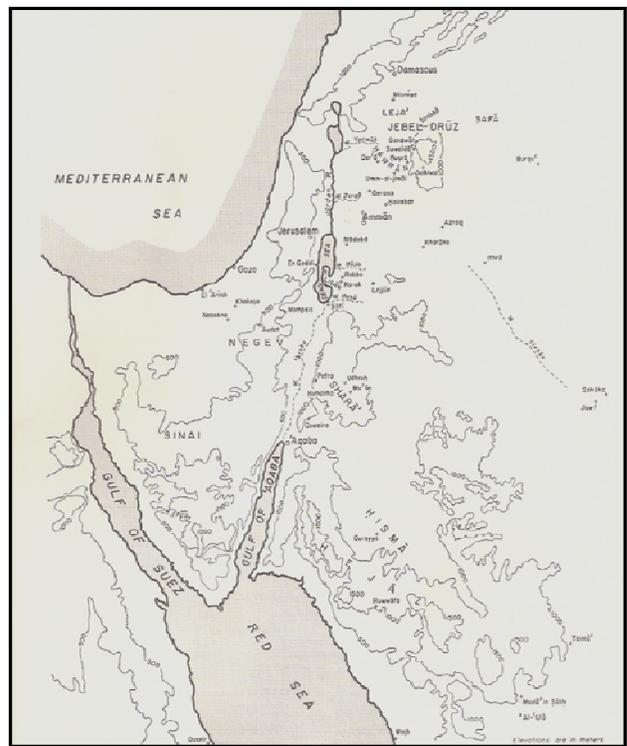


Figure 1: The Ancient Middle East

¹ Kevin Butcher, *Roman Syria and the Near East* (Los Angeles: Getty Publications, 2003), 421.

separate regional archaeological surface surveys, in one area of central Jordan, in an effort to understand land use in this region in the late Byzantine period. It is the hypothesis of this thesis that the Byzantine period reflected increased settlement and intensified use of land for agriculture compared to earlier periods.²

The three surveys discussed in this paper are the Wadi el Hasā archaeological survey, the Southern Ghors and Northeast Arabah archaeological survey and the Tafila-Busayra archaeological survey. All of these surveys were carried out by Burton MacDonald.³ Together, these surveys present a contiguous area of ca 2,000 square kilometers, with 1596 sites in all, located in modern day west central Jordan, southeast of the Dead Sea. The surveys were conducted intermittently from 1979 to 2001. These were regional surface surveys, which were intended to present an archaeological record from prehistoric through pre-modern periods. Surface surveys, by their nature, are far less informative than archaeological excavations. Geographical location and climate as well as historical events and forces were an important determining aspect in settlement and quantitative land use and consequently vital for this thesis. Therefore, this study

² The concept of frontier should not be confused with that of boundary. Boundaries are static lines of separation, whereas the Roman frontier was the periphery of society where the political and economic systems influenced a wider inhabited zone of not only Romans but indigenous people also. The *limes* of Rome were the farthest zones of Roman settlement. For more on this subject see, C.R. Whittaker, *Rome and its Frontiers: The Dynamics of Empire* (London: Routledge, 2004).

³ Burton MacDonald, *The Wadi el Hasā Archaeological Survey 1979-1983, West Central Jordan* (Ontario: Wilfrid Laurier University Press, 1988); Burton MacDonald, *The Southern Ghors and Northeast Arabah Archaeological Survey* (Sheffield, England: J.R. Collis Publications, 1992); Burton MacDonald, L.G. Herr, M.P. Neeley, T. Gagos, K. Moumani and M. Rockman, *The Tafila-Busayra Archaeological Survey 1999-2001, West-Central Jordan* (Boston: American Schools of Oriental Research, 2004).

will use regional geographic and geologic information and known historic events in conjunction with the survey evidence, when considering settlement and land use.

The periods of intensification and abatement are clear from survey evidence. These periods followed expected phases until the Byzantine Era. Instead of a time of abatement, the Byzantine period (324-640) witnessed continued settlement throughout all three survey areas. There were more farms and villages than at any other time. Watermills could have been built at the time because thriving agriculture could have compensated for building costs. This was the most intensively settled and presumably productive time according to the artifactual evidence. Sections of this thesis will provide evidence for this Byzantine intensification while others will provide foundational information.

This chapter will focus as an introduction for the thesis. First, it is important to understand the history and background of the area in which the surveys were conducted. This area was inhabited by nomads and settlers, sometimes at the same time. Historic events, such as conquest by foreign powers and urbanization changed how the land was used and settled. After a discussion of the history of the Wadi el Hasā region of Jordan, each of the three surveys will be described briefly. This section will include information about previous surveys in the area as well as brief descriptions of MacDonald's methods and sites and an outline of the geographic area. At this point, the challenge of using MacDonald's surveys needs to be made clear. Finally there will be a discussion of both primary and secondary sources utilized in this paper and an explanation of their importance.

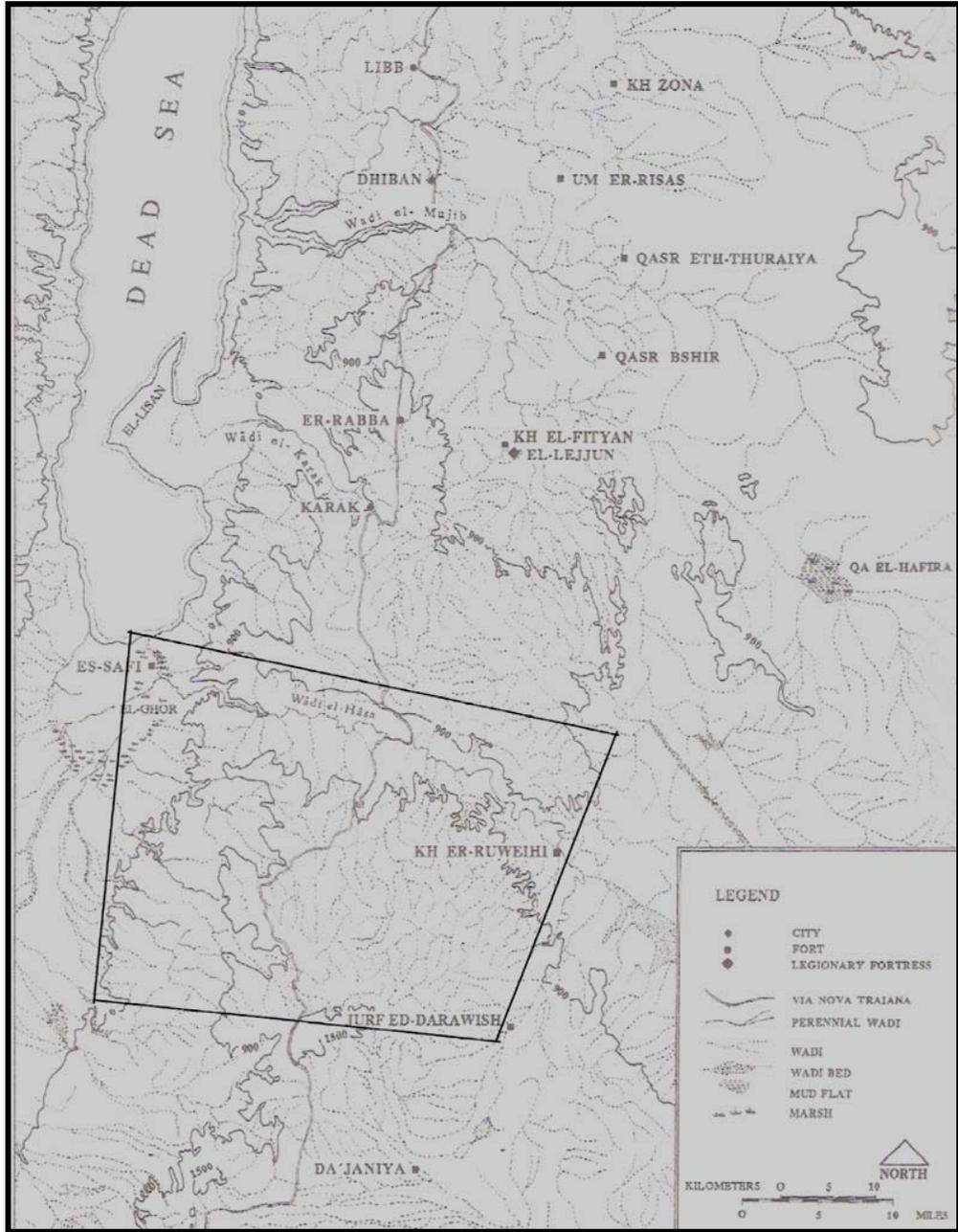


Figure 2: The Three Survey Areas Combined

B. HISTORY- INTENSIFICATION/ABATEMENT

Historically, periods of population intensification were intermittent with times of population abatement throughout the Middle East. These fluctuations can be traced clearly during much of the history of Rome and the Middle East. The reasons for these occurrences are still debated but the facts of their incidence are accepted among historians and archaeologists. La Bianca first described this pattern in his report on the Heshbon excavation and survey in 1990.

Oystein LaBianca, an anthropologist from Andrews University; Institute of Archaeology, joined the Heshbon Expedition in its second season in 1971. Originally the expedition's mission was to find evidence for the Hebrew Exodus and subsequent conquest of Canaan as told in the Hebrew/Christian Bible; however the directors' pursuit of scientific procedures of new archaeology expanded this mandate and made LaBianca's thesis possible. The directors insisted on strict adherence to scientific procedures for all strata of excavation, therefore establishing a long narrative of land use in central Jordan not just the time of the Exodus. Soil layers were carefully examined for pottery, animal bones, carbonized seeds, ecological findings and archaeological findings. All of this evidence was carefully recorded. From this evidence LaBianca studied the food system intensification and abatement which was associated with sedentarization and nomadization over long periods of time. LaBianca used the concept of agricultural activities that individuals and societies use in order to

grow, disperse, and consume food, because of its universal, timeless and vital necessity.⁴

LaBianca linked intensification to greater opportunities and advancements and population growth. He defined intensification as times when more effort was used on food production. Conversely he linked abatement to dangers, diseases and short sightedness from governing bodies. Abatement, he described as times when, at the same locations as above, less effort was used for food production. This evidence, together with primary and secondary accounts, allowed LaBianca to describe the periods of sedentarization/intensification and nomadization/abatement in Jordan.⁵ LaBianca did caution that his approach had limits as to its use in every location and in all conditions. LaBianca concluded that the Heshbon region saw a steady increase or intensification of settlement over time until the mid seventh century. However, the conclusions of several surveys since that time have disputed this and spoken to recurring periods of intensification and abatement.⁶

However, LaBianca's description and definition of these patterns are still valid even if his conclusions are debatable. This pattern was persistent in the area of Jordan, south of Heshbon, which is the focus of this paper. Intensification and abatement are evident in the history and in archaeological evidence of this region. But to first

⁴ Oystein Sakala LaBianca, *Sedentarization and Nomadization: Food System Cycles at Hesban and Vicinity in Transjordan*, ed. Lori A. Haynes (Berrien Springs, MI: Institute of Archaeology and Andrews University Press, 1990), xvi-10.

⁵ *Ibid.*, 13-27.

⁶ For more on this evidence and discussion see, Matt Breznai, "Central Jordan in the Classical Period" Masters Thesis, North Carolina State University, 2007.

understand the history of the central Jordanian region, it is necessary to discuss the history of not only this but the entire region.

Before Roman occupation, the indigenous people of Arabia formed their own associations and alliances. These territories were loosely organized into nomadic or semi-nomadic tribal confederations as the need arose.⁷ This relative independence alternated with periods of domination by neighboring lands, such as Egypt, Mesopotamia and Anatolia. The Early Bronze period (ca.3300- 1950 BC) represented an intensification of population in MacDonald's surveys, except in the Tafila-Busayra survey.⁸ This was followed by an abatement of sedentary population in the Middle and Late Bronze Period, ca. 1950-1200 BC. Later it appears that the region east and south of the Dead Sea was inhabited by people in the Iron Age, 1200-539 BC, who built fortifications.⁹ These people made use of tribal confederations or even kingdoms. Two of these kingdoms, the Moabites and Edomites of the Bible, were thought to have lived in this area possibly as early as the 13th -12th centuries BC, or the Late Bronze Age,¹⁰ although MacDonald dates them to the 10th century BC.¹¹ And other scholars date them to the 7th century BC or later.¹² Hanoch Reviv links the Edomites and Moabites to the time of Ramses II, (1304-1237 BC) according to verses in Numbers 21:26 of the

⁷ Diodorus of Sicily, *The Library of History*, vol. 2, ed. C.H. Oldfather, The Loeb Classical Library (Cambridge: Harvard University Press, 1935) 2.48.1-4.

⁸ MacDonald, *Tafila-Busayra Archaeological Survey*, 418.

⁹ MacDonald, *Wadi el-Hasā Archaeological Survey*, 188.

¹⁰ S.Thomas Parker, *The Roman Frontier in Central Jordan* (Washington DC: Dumbarton Oaks Research Library and Collection, 2006), 2:522-523; Stiebing, William H. Jr., *Ancient Near Eastern History and Culture* (New York: Longman, 2009), 253.

¹¹ MacDonald, *Tafila-Busayra Archaeological Survey*, 291.

¹² Piotr Bienkowski, *Early Edom and Moab, The Beginning of the Iron Age in Southern Jordan*, Sheffield Archaeological Monographs 7 (Sheffield: J.R. Collins, 1992), 8.

Bible.¹³ The area of MacDonald's three surveys encompasses what is considered northern Edom along the southern border of Moab to its north. Israel and Judah had also become kingdoms by the 12th century BC. During the 11th and 10th centuries BC, when David and Solomon ruled Israel, the Old Testament reports that these rulers conquered Moab and Edom during their respective reigns.¹⁴ Therefore, both Edom and Moab were reportedly independent kingdoms or tribal federations sometime between the 13th and 7th centuries BC.

Scholars maintain that the 'King's Highway', later the *via nova Traiana*, was already in use by the 10th century BC. This route transverses the survey area from north to south. Scholars also maintain that this was a major trade route which connected with other routes throughout the Middle East.¹⁵ Solomon as well as the Edomites used one of these trade routes in the 1st millennium BC which extended from the Mediterranean to the Red Sea.¹⁶ One route passed westward through the Negev from the King's Highway across Wadi Arabah. Another important route, the 'Incense Road', in the classical era, passed from Petra to Gaza through the Negev.¹⁷ Therefore, the region of this survey was well travelled and used from the 1st millennium BC.

¹³ Hanoch Reviv, "The Canaanite and Israelite Periods." In *The History of the Holy Land*, ed. Michael Avi-Yonah (Jerusalem: Jerusalem Publishing House, 1969), 45-47.

¹⁴ 1 Chron. 18:2; 18:12-13; 2 Chronicles 8:17-18; 1 Kings 9:26-28 [New International Version]

¹⁵ Stiebing, *Ancient Near Eastern History and Culture*, 248.

¹⁶ Michael Avi-Yonah, *Holy Land* (New York: Holt, Rinehart and Winston, 1972), 26-27.

¹⁷ Parker, *The Roman Frontier in Central Jordan*, vol. 2, 533.

Edom was an independent state in the Iron Age but was conquered in the 8th century by the Assyrian empire along with Moab and Israel.¹⁸ The Assyrians preferred to rule through native vassal kings. MacDonald's survey suggests that the study area was intensively occupied during the period of Assyrian domination.¹⁹ Urbanization was heaviest in the north on the coast of Phoenicia, which offered a supply of ships, ports and manpower for the navy.²⁰ Historically the 8th through the 4th centuries BC were tumultuous years of rebellion, upheaval and resettlement throughout the Middle East.

After the Assyrian domination the Neo-Babylonians, or Chaldeans, conquered Assyrian lands including Syria, Palestine, Judah, Moab and Edom. The Babylonian Age was one of continual unrest as various vassals revolted and the Babylonians intermittently attacked Egypt.²¹ Later in the 6th century BC, Cyrus I rose to the throne of Persia and by his death in 530 BC had conquered the Babylonian Empire including the Levant. The Arab nomads became allies of the Persians who allowed their chieftains to continue to rule with some autonomy. Very little historical or archaeological evidence exists from Jordan for the Persian Period, 539-332 BC. Perhaps archaeologists fail to recognize pottery from this period or it was a period of abatement in sedentary settlement. But excavations of the Edomite sites of Buseirah and Tawilan suggest continual occupation from the Late Iron Age into the Persian

¹⁸ Stiebing, *Ancient Near Eastern History and Culture*, 275, 263; Hanoch Reviv, "The Canaanite and Israelite Periods", in *The History of the Holy Land*, 92.

¹⁹ MacDonald, *Wadi el Hasā Archaeological Survey*, 292.

²⁰ Kevin Butcher, *Roman Syria and the Near East*, 23-4.

²¹ Stiebing, *Ancient Near Eastern History*, 294-295; Hanoch Reviv, "The Canaanite and Israelite Periods", in *The History of the Holy Land*, 97.

period. This Persian rule continued until Alexander's conquest in BC 330, which ushered in the Hellenistic Age.²²

MacDonald noted a continued abatement in Hellenistic artifacts in his study areas, suggesting a retreat of the population from the area.²³ After Alexander's death and the division of his empire, Ptolemy, one of Alexander's generals, acquired a portion of Alexander's empire including southern Palestine and Jordan. Ptolemaic rule lasted about a century, 301-200 BC, but again there is little artifactual evidence in the area from this time. Seleucus I, another of Alexander's generals, captured northern Syria. He "encouraged the development of Greek cities" and created a municipal system which endured into the Roman occupation. The Seleucids appropriated Palestine and Jordan from the Ptolemies and continued a policy of urbanization, such as the cities later known as the Decapolis in northern Jordan.²⁴ The southern region which is the focus of this thesis was much less settled by the Seleucids.

Strabo stated that the indigenous inhabitants of this region by this time were Arabs, called Nabataeans.²⁵ The Nabataeans were established in the region by the 4th century BC. They were originally nomadic but had become sedentary by the 1st century BC. Diodorus, relying on the 4th century BC historian Hieronymus, wrote of the Nabataeans transporting frankincense, myrrh, and bitumen to the Mediterranean and

²² Stiebing, *Ancient Near Eastern History*, 317-318.

²³ MacDonald, *Wadi el Hasā Archaeological Survey*, 192-3; *Tafila-Busayra Archaeological Survey*, 58.

²⁴ Butcher, *Roman Syria*, 25.

²⁵ Strabo, *Geography*, vol. 7, ed. T.E. Page, trans. Horace Leonard Jones, The Loeb Classical Library (Cambridge: Harvard University Press, 1930), 16.4.1-2.

Egypt.²⁶ By the 1st century BC they had established settlements and towns. Diodorus stated that the Nabataeans gained wealth through their dominance over the trade of luxury items such as spices and incense as early as the 4th century BC and that in his own time, the 1st century BC, a trade route ran through Petra from Upper Arabia to the coast of the Red Sea.²⁷ Nabataea was wealthy from its vast and longstanding trading network in incense, gold and spices. Ptolemy's lack of interest in this area allowed the Nabataeans to control an area as far north as the region east of the Dead Sea, east of the later Decapolis cities in southern Syria as well as the survey areas.²⁸ All in all, at the end of the 1st century BC, the Nabataeans controlled a kingdom which incorporated parts of modern day Syria, Jordan, Palestine, the Sinai Peninsula and Saudi Arabia.²⁹

The Roman general Pompey annexed northern Syria as a Roman province in 64 BC by deposing the last Seleucid king, Antiochus XIII. He took the area as a province and buffer against both Parthia and Egypt. Pompey divided the Levant, setting up client states, including Judaea. He did not attack the Nabataean kingdom.³⁰ But Nabataea became an autonomous client state. Under the Nabataean client king Aretas IV, 9 BC-AD 40, the kingdom prospered. Much of this prosperity still came from trade.³¹ In 106

²⁶ Diodorus of Sicily, *The Library of History*, vol. 10, ed. G.P. Goold, trans. Russel M. Geer, The Loeb Classical Library (Cambridge: Harvard University Press, 1954), 19.100.1.

²⁷ Diodorus of Sicily. *The Library of History*, vol. 2, ed. T.E. Page C.H, trans. Oldfather, The Loeb Classical Library (Cambridge: Harvard University Press, 1953), 3.42.5.

²⁸ Parker, *The Roman Frontier in Central Jordan*, vol.2, 528.

²⁹ G.W. Bowersock, *Roman Arabia* (Cambridge: Harvard University Press, 1994), 23-25.

³⁰ Butcher, *Roman Syria*, 21-2.

³¹ Ibid., 97; Jaakko Frosen, Antti Arjava, Marjo Lehtinen, eds., *The Petra Papyri I* (Amman, Jordan: American Center of Oriental Research, 2002), 1.

AD Nabataea was annexed by Trajan, forming the province of *Arabia Petraea*.³²

MacDonald overlapped the Nabataean and Roman periods in his surveys because of this co-existence. Trajan's decision to annex Nabataea could have stemmed from his desire to control their profitable trade, although modern scholars discuss various motivations.³³

Arabia remained under direct Roman rule from the early 2nd century until the Islamic invasion of AD 636. But this by no means indicated a continual rise in population and settlement patterns. Evidence points to continued periods of intensification and abatement until the Islamic conquest. A number of different factors caused this process, not all of which are known or understood. Trajan built the *via nova Traiana* from Bostra, in southern Syria, to Aila at the Gulf of Aqaba between 111 and 114 AD.³⁴ A system of forts along and east of the *via nova Traiana* were built between the 2nd to the 4th centuries AD and provided the Romans with a system of lookout positions to monitor traffic along the wadis and the road.³⁵ The *legio III Cyrenaica* and auxiliary troops, totaling 10,000 men, were based in Bostra at this time to provide security to the frontier region.³⁶ The *via nova Traiana* was repaired and additional forts were constructed under the Severan Dynasty, AD 193-235.³⁷

³² Dio Cassius, *Roman History* vol. 8, G.P. Goold, ed., Russel M. Geer, trans., The Loeb Classical Library (Cambridge: Harvard University Press, 1925), 68.14.5.

³³ Parker, *The Roman Frontier in Central Jordan*, vol. 2, 531.

³⁴ *Ibid.*, 534.

³⁵ MacDonald, *Wadi el Hasā Archaeological Survey*, 292.

³⁶ Parker, *The Roman Frontier in Central Jordan*, vol. 2, 573.

³⁷ S. Thomas Parker, *Romans and Saracens: A History of the Arabian Frontier*, American Schools of Oriental Research Dissertation Series, No. 6, ed. James M. Weinstein (Winona Lake, IN: Eisenbrauns, 1986), 158.

Palmyra, a Roman client kingdom in Syria, profited particularly because of its strategic position as an oasis city along the important trade route. After the end of the dynasty of the Severi, despite and perhaps because of the chaos at the Roman court, distant client states, such as Palmyra, continued to thrive. Philip the Arab came to power during this turbulent time, 244-249, and Roman Arabia benefited from his rule. Born in the Hauran, Phillip is believed to have been a patron of the Nabataean city of Bostra.³⁸ Greater security during his reign could have encouraged settlement in these frontier areas which in turn provided the military with provisions.³⁹

The crisis of the 3rd century, 235-284, was a time of turbulence and disruption of security along many borders of the empire. Palmyra's stable kingdom still enjoyed the wealth of the trade routes and elevated status and the esteem of their population and military. Rome's distraction and Palmyra's power combined enabled Queen Zenobia of Palmyra to seriously challenge Roman rule by conquering Syria, Palestine, Arabia, Egypt and some of Asia Minor.⁴⁰ Aurelian, 270-275, was ruthless in securing the eastern border for Rome after Zenobia's challenge.⁴¹ Palmyra was reconquered and the trade route through Palmyra shifted to other corridors.⁴²

Finally Diocletian, 284-305, regained control of Rome's frontiers and strengthened and rebuilt fortifications. These measures created a very different frontier

³⁸ Butcher, *Roman Syria*, 54, 118.

³⁹ *Ibid.*, 168.

⁴⁰ Bowersock, *Roman Arabia*, 136-7.

⁴¹ Martin Sicker, *The Pre-Islamic Middle East* (West Port, CT: Praeger, 2000), 179; Irfan Shahîd, *Byzantium and the Arabs in the Fourth Century* (Washington, DC: Dumbarton Oaks, 1984), 14.

⁴² David Kennedy, *The Roman Army in Jordan* (London: The Council for British Research in the Levant, 2004), 51; Shahîd, *Byzantium and the Arabs*, 14.

from the late 3rd century onwards. Before Arabia was annexed, Rome maintained client kingdoms such as the Herodian and Nabataean kingdoms who deferred to Rome. Under Hadrian, 117-138, the region was divided into *Syria Palaestina*, formerly *Judaea* or the earlier Herodian kingdom, and Arabia, the former Nabataean kingdom now under direct Roman rule. Diocletian's changes in the structure of the Empire divided the provinces further. This time frame is vague but the process started by Diocletian was finalized by Constantius II's reign, 337-361. Arabia was split into two provinces, Arabia to the north and the southern portion was added to *Syria Palaestina*. Later in the 4th century, *Syria Palaestina* was divided into *Palaestina I*, *Palaestina II* and *Palaestina III*. The three surveys of this paper lie in *Palaestina III*.⁴³ The 4th and 5th centuries produced the most profoundly strengthened frontiers of the Roman era and intensification again.⁴⁴ The Arab nomads who had previously been controlled by Palmyra for Rome were now supervised by Roman troops.⁴⁵ The safety provided by these troops encouraged another period of intensification. But after the 5th century, the frontier defenses declined.⁴⁶ The Roman Empire in the west collapsed and troops were diverted to regain that region or were simply demobilized as an economic measure. The heavy fortification system was mostly abandoned by the 6th century and mobile field armies based behind the frontiers gained prominence. On the eastern frontiers, Arab *foederati*, together with the

⁴³ Butcher, *Roman Syria*, 84- 86.

⁴⁴ Parker, *Romans and Saracens*, 158.

⁴⁵ Butcher, *Roman Syria*, 62.

⁴⁶ Parker, *Romans and Saracens*, 149.

limitanei, assumed responsibility for many military duties including patrolling the borders.⁴⁷

The *foedus* was an agreement between the emperor and the chiefs of the Arab tribes. At the death of one, emperor or chief, the *foedus* was automatically voided and had to be renewed. At times both Roman and Arab rulers used this condition against the other. When Constantine died in 337 and the *foedus* was dissolved, some Arab *foederati* revolted, forcing Constantius II (337-361) to concede to their demands.⁴⁸ Julian (361-363) suspended payments of federates salaries because he felt that the empire did not need them. However, when he later invaded Persian Mesopotamia, he reconciled with them and they fought with him at the Battle of Ctesiphon. Afterward, he again refused them their pay and Ammianus Marcellinus reported that this led to hostility from local *Saraceni* in Mesopotamia.⁴⁹ Ammianus Marcellinus described the Saracens as Arabs who lived in “the boundless tract from which Asia and the provinces of Syria take their beginning.”⁵⁰ The federate forces were made up of these Saracens. Julian was killed by an unknown assailant and because of his rounds of hostility with the *foederati*, made them suspect in his murder.⁵¹ However, the *foederati* returned to Roman service during the reign of Valens in 364-378. Their adoption of Christianity

⁴⁷ Butcher, *Roman Syria*, 70.

⁴⁸ Shahîd, *Byzantium and the Arabs in the Fourth Century*, 528.

⁴⁹ Ammianus Marcellinus, *The History* vol 2, ed. G.P. Goold, trans. John C. Rolfe, The Loeb Classical Library (Cambridge: Harvard University Press, 1940), 25.6.10; 25.1.3.

⁵⁰ *Ibid.*, 22.15.1-2.

⁵¹ Shahîd, *Byzantium and the Arabs*, 529-530.

helped the *foederati* develop a greater fidelity to ‘Christian Rome’ but even that was not a guarantee of their permanent loyalty.⁵²

Differences in Christian doctrines would also cause insurgence among the Arab federates.⁵³ For instance, Valens was an Arian and religious fidelity became a source of contention between the *foederati* and the emperor. The tribe of the Tanukhids was ruled by an orthodox king. When he died without an heir, in 370, his wife Mavia gained control of the tribe.⁵⁴ Mavia refused to renew the *foedus* and even raided the *limes* and villages in Palestine and Arabia.⁵⁵ Her dispute with Rome was a religious issue with the Arian controlled leadership. Mavia wanted the orthodox bishop, Moses, to be given administration over her *foederati*. Her argument was not about Roman rule but doctrinal issues of faith.⁵⁶ Upon the satisfactory resolution of the dispute, Mavia’s troops again joined the service of Rome’s *foederati*. Sources recognize her tribes fighting alongside the Romans at the battle of Adrianople.⁵⁷ These larger tribes could use their influence against Rome when they wanted.

Because of the fluidity of the tribal system and the inaccuracy or scarcity of sources it is difficult to identify tribes that were in service to Rome. One large and important tribe was the Tanukh. Arab sources, drawing from the 10th century Arabic historian Hisham, claimed that this tribe migrated to Syria from “the land of the Two

⁵² Shahîd, *Byzantium and the Arabs*, 15, 21, 21.

⁵³ Doctrinal differences included: Arianism- belief that the Son [Jesus] was secondary to the Father [God], Nestorianism- belief in the human nature of Christ, Monophysitism- belief in the wholly divine nature of Christ, and Orthodox- Christ had two natures, divine and human.

⁵⁴ John Spencer Trimingham, *Christianity Among the Arabs* (New York: Longman, 1979), 7.

⁵⁵ Kennedy, *The Roman Army in Jordan*, 42.

⁵⁶ Shahîd, *Byzantium and the Arabs*, 532-53; Butcher, *Roman Syria*, 65.

⁵⁷ Shahîd, *Byzantium and the Arabs*, 535.

Rivers”, or Mesopotamia.⁵⁸ They were the dominant Arab tribe for a time but it is debated if their control extended to other tribes as the Ghassanids would in later centuries.⁵⁹ Authorities also debate whether the powerful Tanukh and Lakhmid tribes were the same tribe, related tribes, or separate entities altogether.⁶⁰ And some sources maintain that the Lakhmids were in service to the Sasanians for several centuries before migrating to Roman territory.⁶¹ The transient nature of tribal alliances could lend some truth to each of these suggestions. But the power of the Tanukhs was manifest late in the fourth century through strong rulers like Mavia. The relationship of the Arabs and the Romans remained tenuous from the 4th century onward.

Frequent tension between Rome and the *foederati* who guarded the borders could have made the frontier regions less safe and therefore less desirable for settlement in the Byzantine era. Western regions of the survey region, which were more distant from the insecure frontier and therefore less vulnerable to nomadic raids, were more densely settled while the eastern frontiers were more sparsely inhabited. While the desert fringes were preyed upon by raiding nomadic tribes, the *foederati* apparently did not provide sufficient security for people to settle in this area.⁶² The fragile frontier was never completely secure again due to these intermittent rebellions and divided loyalty among the Arab allies of Rome.⁶³ By the 7th century these frontier defenses had

⁵⁸ Shahîd, *Byzantium and the Arabs*, 543.

⁵⁹ *Ibid.*, 545; Parker, *Romans and Saracens*, 132.

⁶⁰ Shahîd, *Byzantium and the Arabs*, 540; Parker, *Romans and Saracens*, 132.

⁶¹ Butcher, *Roman Syria*, 64.

⁶² Irfan Shahîd, *Rome and the Arabs: A Prolegomenon to the Study of Byzantium and the Arabs* (Washington DC: Dumbarton Oaks, 1984), 32.

⁶³ Parker, *Romans and Saracens*, 146.

declined so much that when the Islamic army arrived in 636, the area was weakened and practically defenseless against these Arab invaders.

C. OVERVIEW OF SURVEYS AND METHODS

I. HISTORY OF EXPLORATION

Burton MacDonald directed the three surveys which are the primary archaeological evidence for this analysis. MacDonald's goal was to understand "prehistoric and historic land-use patterns in the topographical zones of the survey territory."⁶⁴ He also wanted to identify settlement patterns specifically to find prospective archaeological sites visible on aerial photographs. He then aimed to complete an "archaeological history" of the area encompassed by these three surveys, which formed a contiguous region in central Jordan.⁶⁵

Earlier generations of scholars had visited this area with important but superficial surveys in the 19th and 20th centuries. MacDonald utilized them in both his site search and analysis of the area. The region was first visited in 1812 by Burckhardt who followed the Muslim pilgrimage route from Damascus to Mecca. He mentioned several villages in the Wadi el-Hasā survey area.⁶⁶ The area was also visited by Musil in 1896 and Brünnow and von Domaszewski in 1904.⁶⁷ However, in the 1930's Nelson Glueck excavated in the Wadi el-Hasā area and published three works on his findings. In 1973 and 1974 several sites within the Wadi el-Hasā survey area were visited by

⁶⁴ MacDonald, *Tafila-Busayra Archaeological Survey*, 3.

⁶⁵ MacDonald, *Wadi el Hasā Archaeological Survey*, 2; *Ibid.*, 3.

⁶⁶ John Lewis Burckhardt, *Travels in Syria and the Holy Land* (Middlesex, TW: The Echo Library, 2006), 112- 166.

⁶⁷ MacDonald, *Wadi el Hasā Archaeological Survey*, 4.

other scholars. It is Glueck's work, however, that was most significant to future scholarship on the area.⁶⁸ MacDonald stated that Glueck had visited 37 of his 1074 Wadi el-Hasā survey sites and 23 of the 290 Tafila-Busayra sites. However, MacDonald's conclusions about the occupational record and Glueck's conclusions often are not in agreement.⁶⁹

Nelson Glueck was an early 20th century rabbi and scholar. He had a PhD in Biblical Studies and taught at the Hebrew Union College from 1928 and became its president from 1947 until his death in 1971. He conducted survey work in the Negev in Israel and in Jordan in the 30's and 40's. Dr. Glueck was a pioneer in dating sites by their associated surface pottery. He identified many sites in Jordan in the 1930's. Pottery identification was in its infancy at this time. Therefore some of Glueck's conclusions have been corrected by subsequent ceramic analysis. However, Glueck's research is vitally important to any archaeological survey. In addition, many of the sites Glueck discovered have since disappeared due to modern destruction and natural forces, making his reports critical and unique in understanding the survey area.⁷⁰

⁶⁸ Nelson Glueck, *Explorations in Eastern Palestine I, Annual of the American Schools of Oriental Research* 14 (Philadelphia: American Schools of Oriental Research, 1934); Glueck, *Explorations in Eastern Palestine II, Annual of the American Schools of Oriental Research* 15 (New Haven, CT: American Schools of Oriental Research, 1935); Glueck, *Explorations in Eastern Palestine III, Annual of the American Schools of Oriental Research* 18-19 (New Haven, CT: American Schools of Oriental Research, 1939).

⁶⁹ MacDonald, *Wadi el Hasā Archaeological Survey*, 6.

⁷⁰ Nelson Glueck, *Rivers in the Desert* (New York: American Book-Stratford Press, Inc., 1959); Glueck, *The Other Side of Jordan* (Cambridge: American Schools of Oriental Research, 1970).

MacDonald's second survey was the Southern Ghors and Northeast Arabah archaeological survey, conducted in 1985 and 1986.⁷¹ This area was perhaps the most previously visited and documented of the three survey regions. Burckhardt visited the region around Zoara (al-Safi) and the Ghors in 1812, followed by many different 19th and 20th century explorers.⁷² Earlier scholars studied the geology, architecture and natural resources, including mining, of the region and excavated some sites. MacDonald refers to these works throughout this survey. Fritz Frank in 1932 and Glueck in 1935 also surveyed the Southern Ghors and Northeast Arabah. Other 20th century explorers included Raikes, McCreery, and King.⁷³ In the late 1970's Jordan began development of this area, including building a highway from Aqaba to Ghor al-Safi and beyond, an irrigation system, dams, agricultural development, housing and

⁷¹ Burton MacDonald, *Southern Ghors and Northeast Arabah Archaeological Survey*, 4.

⁷² John Lewis Burckhardt, *Travels in Syria and the Holy Land*.

⁷³ For more information on these explorers see: Fritz Frank, *Aus der Araba I: Reiseberichte. Aeitschrift des Deutschen Palästina-Vereins* 57 (1934), 191-280; A. Alt, *Aus der Araba II. Römische Dastelle und Strassen. Zeitschrift des Deutschen Palästina-Vereins* 58 (1935), 1-59; A. Alt, L. Wickert, *Aus der Araba III. Inschriften und Felszeichnungen. Zeitschrift des Deutschen Palästina-Vereins* 58 (1935), 60-74; Glueck, "An Aerial Reconnaissance in Southern Transjordan" *Bulletin of the American Schools of Oriental Research* 67 (1937), 19-26; T.D. Raikes, "Ancient Sites in the Wadi Araba and Nearby," Unpublished list of sites deposited by the author in the library of the British School at Amman for Archaeology and History; Raikes, "Notes on Some Neolithic and Later Sites in the Wadi Araba and the Dead Sea Valley," *Levant* 12 (1980), 40-60; Raikes, "The Character of the Wadi Araba," in *Studies in the History and Archaeology of Jordan II*, ed. A. Hadidi, (Amman: Department of Antiquities, 1985), 95-101; D. W. McCreery, "Initial Report of the Archaeological Survey of the Southern Ghors and Wadi Araba," unpublished report submitted to the Department of Antiquities of Jordan (1979); McCreery, "The Nature and Cultural Implications of Early Bronze Age Agriculture in the Southern Ghor of Jordan- An Archaeological Reconstruction," unpublished Ph.D. Dissertation, University of Pittsburg (1980); G. R. D. King, "A Survey of the Southern Ghawr, the Wadi Araba and Western Trans-Jordan," *Proceedings of the Seminar for Arabian Studies* 15 (1985), 41-47; King, "A Survey of Byzantine and Islamic Sites in Jordan. The Third and Fourth Seasons," *Archiv für Orientforschung* 33 (1982, 1983), 251-52; King, et al., "Survey of Byzantine and Islamic Sites in Jordan: Third Season Preliminary Report, The Southern Ghor," *Annual of the Department of Antiquities of Jordan* 31 (1982), 439-59; King, et al., "Survey of Byzantine and Islamic Sites in Jordan. Third Preliminary Report: The Wadi Arabah (Part 2)," *Annual of the Department of Antiquities of Jordan* 33 (1982), 199-215.

quarries. The resulting population boom and economic development destroyed many archaeological sites, including some in this survey.⁷⁴

The third survey area was the Tafila-Busayra region, directly south of the Wadi el Hasā survey. MacDonald's Tafila-Busayra archaeological survey was conducted in 1999, 2000 and 2001. Previous work included P. Thomsen's collection of milestones in this area along the *via nova Traiana*, published in 1917.⁷⁵ Glueck's surveys also included 23 of the 290 Tafila-Busayra sites but generated little information compared to MacDonald's. MacDonald's teams differed with Glueck's conclusions on several of the sites within this survey, as they did in *WHS*.⁷⁶ In the 1980's explorations in this area were done by Hart and Falkner.⁷⁷ Parker surveyed *Jurf ad-Darawish castellum* and *Qasr al-Bint*, sites 141 and 140, respectively, in *TBAS*.⁷⁸ Fiema worked at *Kh. At-Tuwanah*, sites 192 and 180 in *TBAS*, along the *via nova Traiana* and Waheeb surveyed

⁷⁴ MacDonald, *Southern Ghors and Northeast Arabah Archaeological Survey*, 1-4.

⁷⁵ P. Thomsen, "Die römischen Meilensteine der Provinzen Syria, Arabia und Palaestina" *Zeitschrift der Deutschen Palästina-Vereins* 40 (1917), 1-103.

⁷⁶ MacDonald, *Tafila-Busayra Archaeological Survey*, 9-11.

⁷⁷ S. Hart, "Nabataeans and Romans in Southern Jordan," *The Defense of the Roman and Byzantine East*, eds., P. Freeman, D. Kennedy, Proceedings of a Colloquium held at the University of Sheffield, April 1986. In *British Archeological Reports International Series 297* (i) (Oxford: BAR: 1986), 337-42; Hart, "Some Preliminary Thoughts on Settlement in Southern Edom," *Levant* 18 (1986), 51-58; Hart, "Sela': The Rock of Edom?," *Palestine Exploration Quarterly* 118 (1986), 91-95; Hart and R.K. Falkner, "Preliminary Report on a Survey in Edom," *Annual of the Department of Antiquities of Jordan* 29 (1985), 255-77.

⁷⁸ Parker, *Romans and Saracens*, 91-93, 110, 111, 112, 117, 127, 130, 173-74.

in the northwestern region at the *At-Tafila-Ghawr Feifeh* road in 1993.⁷⁹ The only excavation in the area was conducted in 1973 by Bennett at the Busayra citadel.⁸⁰

II. WADI EL HASA SURVEY

The Wadi el-Hasā survey region is bordered on the north by Wadi el Hasā, on the west, by the cliff descending into the Dead Sea Rift Valley, on the east by the Ottoman Hajj road (or pilgrimage road) through Qal át el Hasa and on the south by a modern highway from city of At Tafila to the Karak Highway and the foothills of the Jebel el Masfara.⁸¹ This was a surface survey, meaning scattered sherds, artifacts and visible architectural remains were recorded, but no excavation was undertaken. Team members drove to sites, walked along traverses of land or used pedestrian transects to record data and collect surface artifacts. In the purposive vehicular survey prospective sites obtrusive enough to be seen from a Land Cruiser were recorded by crew members. Occasionally they also found scattered sherds when members left vehicles to investigate sites. This technique was most effective in areas with roads, specifically the western

⁷⁹ Z.T. Fiema, "Tuwaneh and the *Via Nova Traiana* in Southern Jordan: A short Note on the 1992 Season," *Annual of the Department of Antiquities of Jordan* 27 (1993), 549-51; M. Waheeb, "Archaeological Rescue Survey of the Tafileh-Ghawr Feifeh Road Alignment, Sections I + II," *Annual of the Department of Antiquities of Jordan* 37 (1993), 135-46.

⁸⁰ C. M. Bennett, "Excavations at Buseirah," *Levant* 5 (1973), 1-11; Bennett, "Excavations at Buseirah," *Levant* 6 (1974), 1-24; Bennett, "Excavations at Buseirah," *Levant* 7 (1975), 1-19; Bennett, "Excavations at Buseirah," *Levant* 9 (1977), 1-10; Bennett, "Excavations at Buseirah," *Midian, Moab, and Edom: The History and Archaeology of Late Bronze and Iron Age Jordan and North-West Arabia*, J.R.A. Sawyer, D. J. A. Clines, eds., *Journal for the Study of the Old Testament, Supplement Series* 24 (Sheffield, U.K.: JSOT, 1983), 9-17.

⁸¹ MacDonald, *Wadi el Hasā Archaeological Survey*, 13-15.

and central universes.⁸² Purposive pedestrian surveys involved team members walking traverses along natural features such as “ridge-tops and valley bottoms.”⁸³ Three or four people would walk these transverses together using maps, reports, aerial photographs or a guide. This was the most effective method to gather information in the central universe. Pedestrian transects were used in the western universe.

Systematic, parallel transects offered uniform coverage of this universe. These transects were arranged in north-south lines one kilometer apart. In this technique six people walked each transect with 15 meters between two members and then 50 meters between that pair and the next pair of walkers. The width of each transect then was 145 meters.⁸⁴

⁸² MacDonald divided the Wadi el Hasā region into what he named the three ‘universes’, these correspond to regional divisions within the survey area, i.e. the western universe is the western region, central and eastern universes follow this example.

⁸³ MacDonald, *Wadi el Hasā Archaeological Survey*, 18.

⁸⁴ *Ibid.*, 17-20.

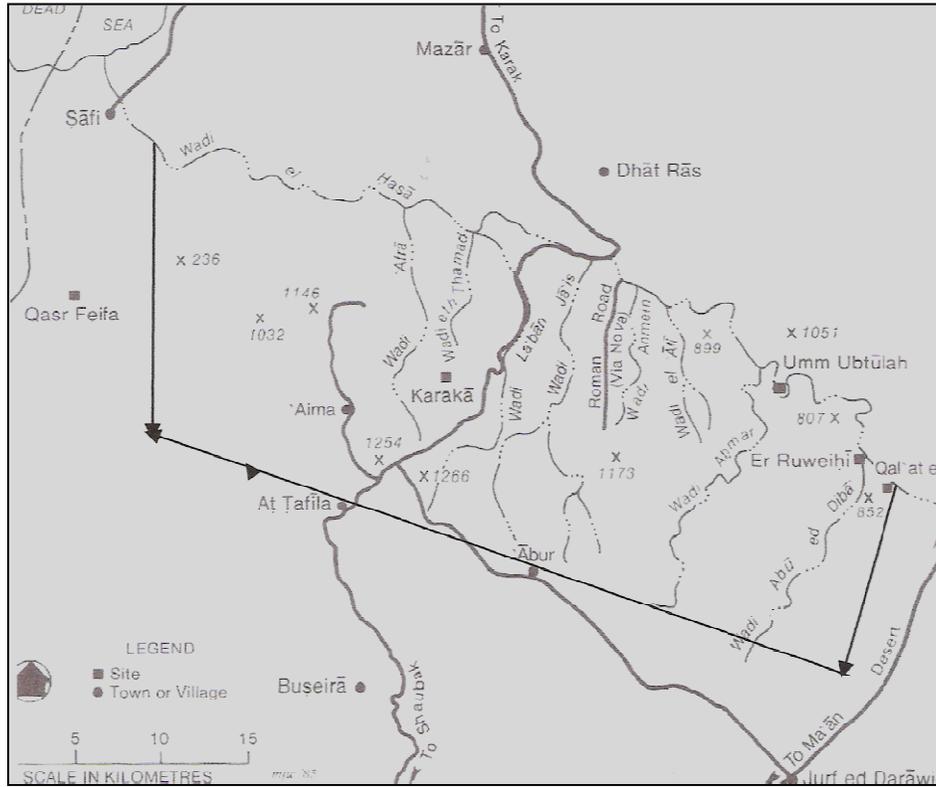


Figure 3: The Wadi el-Hasā Survey Region

III. SOUTHERN GHORS AND NORTHEAST ÁRABAH SURVEY

This survey region encompassed the area from just north of al-Safi to Wadi Fidan, 40 km to the south. An old road through this region connects the Dead Sea, along Wadi 'Arabah, a natural extension of the Great Rift Valley, with Aqaba to the south. The width of the survey was just over 20 km at its widest. The western boundary was the international border however, MacDonald's teams made sure to keep a guarded distance from the border. The eastern border was the Great Rift Valley where the landscape was quite harsh. This small survey area was divided into two separate regions for the purposes of the survey. The northern region was from north of al Safi to the east-west cliffs just north of Qasr al-Tilah and the southern portion extended to Wadi Fidan.⁸⁵ MacDonald drew on extensive prior research to find and record sites. He also used aerial photography, dialogue with local inhabitants and pedestrian transects.⁸⁶

Within the Southern Ghors and Northeast Arabah survey the two regions were further divided into five topographic regions for methodological reasons. These regions were 1) agricultural areas 2) gravel, rock and soil at the base of steep slopes 3) sandy spots and dunes 4) piedmont and 5) wadi beds and ridges. Pedestrian transects covered the agricultural, rock, soil and sandy areas while aerial photography was used to find sites in wadi beds and ridges and piedmont, before pedestrian transects were carried out.

⁸⁵ MacDonald, *Southern Ghors and Northeast Arabah Archaeological Survey*, 1.

⁸⁶ *Ibid.*, 9.

These involved teams of two to seven people covering approximately one third of the actual area, with each team usually ten to fifteen meters apart. Visibility in agricultural

regions was poor due to the growing season and therefore team members were less likely to find sites unless they happened on them. The teams used purposive surveying, meaning they used data from previous records to relocate sites. The wadi beds and other steep areas were typically traversed by goat paths whenever available. The teams found very few sites in the

agricultural, gravel and sandy regions, most sites

were found in the piedmont and then the wadi ridges and beds.⁸⁷

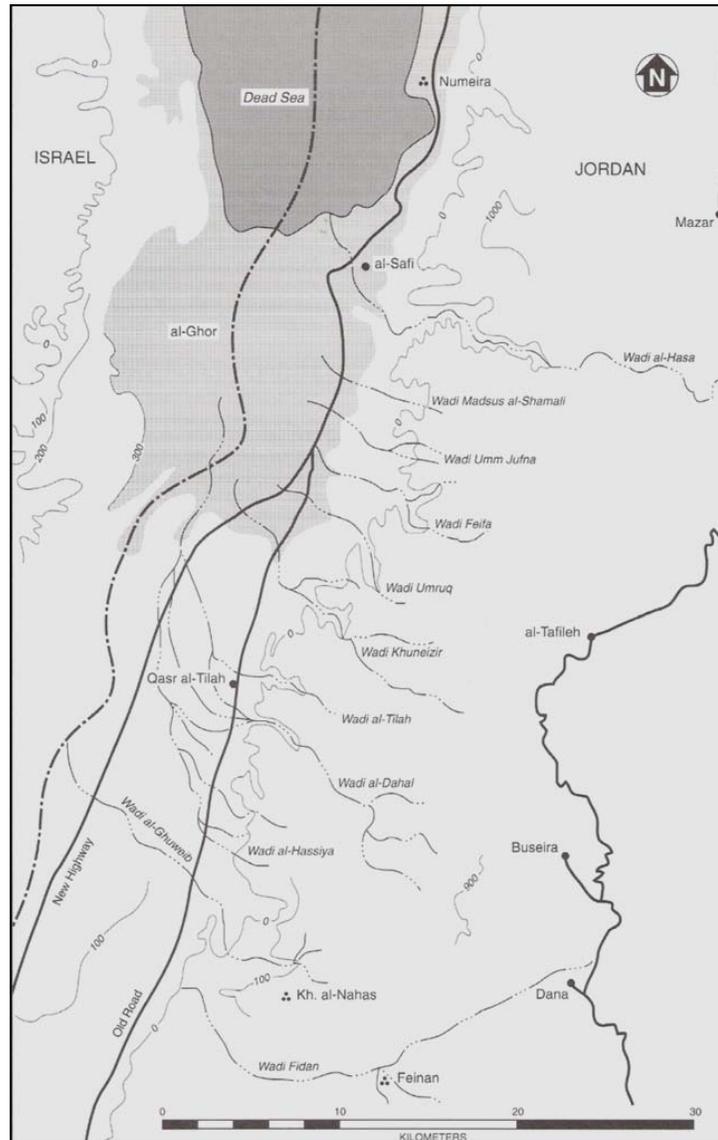


Figure 4: The Southern Ghors and Northeast Arabah Survey Region

⁸⁷ MacDonald, *Southern Ghors and Northeast Arabah Archaeological Survey*, 9-11.

IV. TAFILA-BUSAYRA SURVEY

The Tafila-Busayra survey borders the Wadi el Hasā survey to the north and the Southern Ghors and Northeast Arabah survey to the west. The southern boundary extends from just south of Busayra in the west to Jurf ad-Darwish on the east. The eastern boundary is ca. 5 m in length connecting Jurf ad-Darwish to the southeast corner of the Wadi el Hasā survey region.⁸⁸ This survey, like the Wadi el Hasa, was divided into three universes according to topography. These topographical regions included gorges, the Transjordan Plateau and the eastern desert region. They also subdivided parts of the first two regions into a “Busayra hinterland,” a three kilometer radius around the Busayra Citadel because of its importance as the capital of Edom and to the Egyptians, Assyrians and Babylonians. There were 32 sites related to Busayra. The eastern desert region was also subdivided into two zones so that ancient lakes could be surveyed differently, there were a total of 46 sites related to the lakes.⁸⁹

The methods used for this survey differed in some respects to that of the Wadi el Hasā and Southern Ghors and Northeast Arabah surveys. Random squares of 500 m² were chosen from a map developed from a Geographic Information System (GIS) database. A Global Positioning System (GPS) located a corner of each square. The team members then walked along transects within the square, using a compass to maintain straight lines. Two transects in each square were investigated by two teams, with four to five people per team. At Busayra, only one transect was utilized in an area

⁸⁸ MacDonald, *Tafili-Busayra Archaeological Survey*, 3.

⁸⁹ *Ibid.*, 3, 4, 6.

of 200 m². Any sites bordering the squares were also surveyed. In all 111 squares were transected in the Tafila-Busayra region. Department of Antiquities staff and locals were also interviewed about potential sites. Vehicles were used in a different manner than in the Wadi el Hasa and Southern Ghors. By first using aerial photographs, the teams examined potential sites and then drove or walked the areas to evaluate whether they were truly sites. If so, then surface surveys were conducted.⁹⁰

MacDonald defined archaeological sites by several criteria. All pre-modern, i.e. before 1918, architecture was also considered a site, as were sherd scatters or concentrations of artifacts. Natural features such as caves with evidence of pre-modern occupancy such as artifacts, inscriptions or man made cuttings were also considered sites. MacDonald's teams differentiated between light artifact scatters which occurred evenly on the surface versus those with a higher density of deposit. Only those surface areas with a higher density of artifacts than the surrounding "background noise" were considered sites.⁹¹

⁹⁰ MacDonald, *Tafili-Busayra Archaeological Survey*, 6, 9.

⁹¹ MacDonald, *Wadi el Hasā Archaeological Survey*, 15-17.

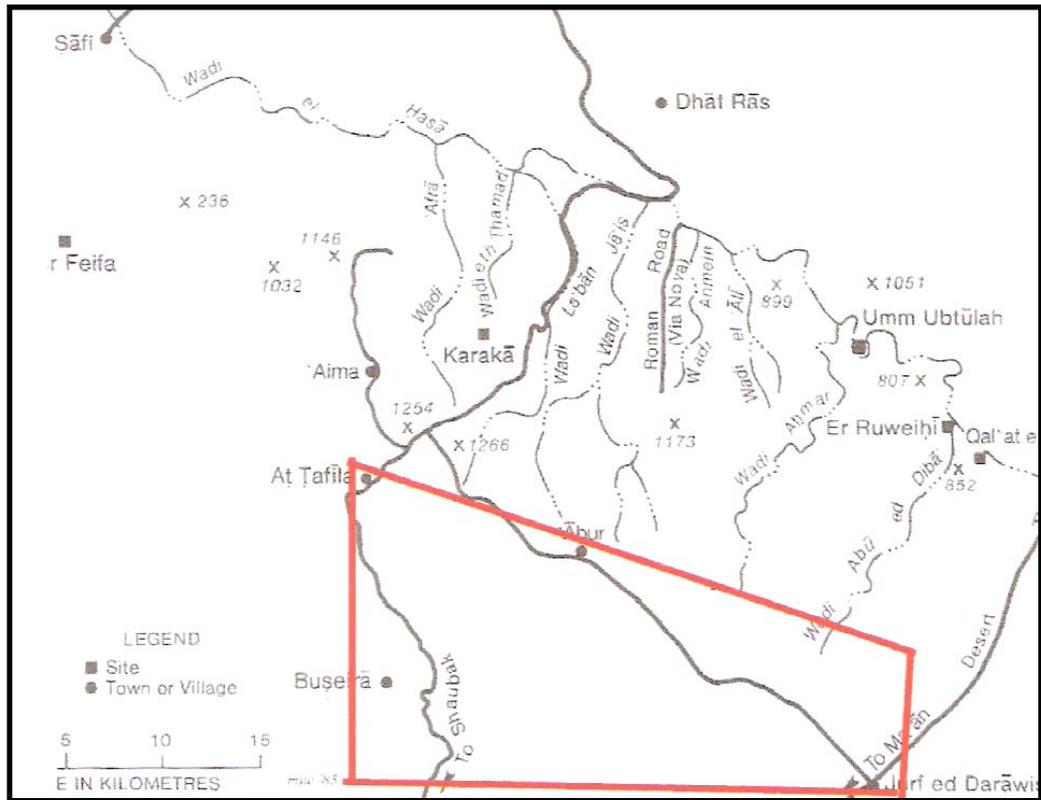


Figure 5: Tafila-Busayra Survey Region

Altogether, the three surveys included the area from the Wadi el Hasā on the north, south of Busayra to the south, the Rift Valley to the west and the desert at Jurf ad-Darwish to the east.⁹² The *WHS* teams recorded 1074 sites, *SGNAS* teams recorded 240 sites and *TBAS* covered between 4.23- 5.73% of each zone with a total of 290 recorded sites.⁹³ In all of these survey areas together, teams discovered structures, terracing (which indicated farming), tombs, towers, caves and pottery sherds, all indicating past human activity. Analysis of these finds determined the presence or absence of sedentary people in the area during particular eras. Of particular interest is pottery, for several reasons. Pottery can often be dated very specifically to a certain time period. While terracing is a clear indicator of farming, associated pottery might suggest when the agricultural areas were in use. While many areas were likely traversed throughout the ages by nomads, pottery usually suggests the presence of sedentary people and therefore land used for dwelling, agriculture, manufacturing, etc. This thesis will discuss the results of these three surveys and extrapolate population and land use, especially during the Late Byzantine era, i.e. the 6th and 7th centuries.⁹⁴

While these surveys are intended to be used to gather information for further study of the region, they also present overt challenges to that capability. The problems with these surveys are numerous. The format of each is different from the others making comparisons difficult. MacDonald neither provided the same data nor complete

⁹² MacDonald, *Tafila-Busayra Archaeological Survey*, 9.

⁹³ SGNAS report gives no data for the percentage of total land actually covered.

⁹⁴ Following MacDonald's example, in an effort to save space, MacDonald's own survey abbreviations will be used, they are as follows: *WHS*- Wadi el Hasā Survey, *SGNAS*- Southern Ghors and Northwest Arabah Survey, and *TBAS*- Tafila-Busayra Survey.

data for each. The *WHS* divided sites according to dominant pottery. This was helpful to easily comprehend settlement patterns according to eras. However, site type, i.e. function of the site, was disassociated with evidence, which made cross-referencing and combining that information difficult. The site discussions were confusing, for example, sites with multiple periods of evidence were discussed only in one period, again hindering the ability to gather complete information on each site. And the narrative about the purpose of a site did not always match information given in the table of sites. Most problematic in *WHS* was the lack of illustrated pottery. Pottery is perhaps the most important means of dating settlements. *WHS* was the only survey of the three to provide references to precisely dated pottery, but the references themselves are now somewhat outdated.

Southern Ghors and Northeast Arabah Archaeological Survey was MacDonald's second survey. This is perhaps the most thorough of the surveys, providing sherd counts and site periods in the discussion and including many more pottery plates. The pottery plates had a wealth of information on fabric color and glazes; however this information was not useful without diagnostic references or specific dating. It was not clear however, in many cases, what the dominant era was for a site because they were discussed in any number of chapters, without commentary concerning settlement patterns. At least *WHS* included a table with a complete list of sites, without dating; however *SGNAS* had no such table.

The last survey, *Tafila-Busayra*, was the most difficult to understand of the three. MacDonald chose to provide only one map with numbered sites, even so, many

numbers were unreadable from having been written on top of each other or on a dark background. In subsequent chapters *TBAS* area maps had dots for sites, without numbers. A magnifying glass and time were the only ways to find all sites. MacDonald did not record the number of sherds per site, or era. His evaluations of dominant sites, the few times this occurred, were based on unknown criteria. This was the only survey to categorize site types and give the percentages of sites per era.

Alexander H. Joffe, in his review of *The Wadi el Hasā Archaeological Survey*, was no less critical. He acknowledged the import of survey information and the difficulty of conducting surveys successfully. Even so, Joffe questioned MacDonald's categories and reasons for grouping elements together. He also complained about the difficulty of finding useful information. He was particularly bothered by MacDonald's apparent ambiguous method of dating pottery and the uselessness of the illustrations. Joffe advocated a structured, accurate and well illustrated volume over the WHS publication. Had he reviewed the other two surveys, it is sure he would have added to his list of complaints about MacDonald's documentation style.⁹⁵

⁹⁵ Alexander H. Joffe, "Book Review of *The Wadi el Hasā Archaeological Survey and Map of Har Hamran-Southwest*," in *Bulletin of the American Schools of Oriental Research*, no. 285 (Feb., 1992), 90-94.

D. TOPOGRAPHY, GEOGRAPHY AND CLIMATE

The topography of the Wadi el Hasā region is chiefly impacted by the north-south fault at the western edge of the survey area. In prehistoric times this fault created a deep rift, extending from southern Syria through the Red Sea and into East Africa. The Jordan River flows in this rift from the Sea of Galilee to the Dead Sea. South of the Dead Sea the rift continues becoming Wadi Arabah from the Dead Sea to the Red Sea at the Gulf of Aqaba, an arm of the Red Sea.⁹⁶ This difference in elevation between the high plateau to the east of the Rift Valley and the plateau itself created Wadi el Hasā which drains into this area from the higher elevations to the east. Smaller tributary wadis drain into Wadi el Hasā from the south.⁹⁷ The survey area includes this entire system of wadis.

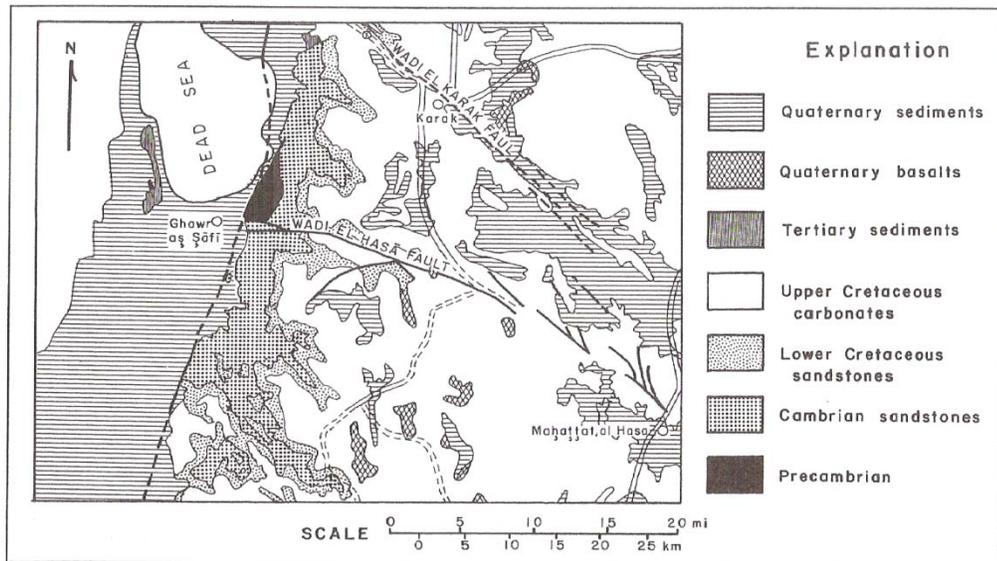


Figure 6: Geological Map of Wadi el Hasā, Southern Ghors and NE Arabah

⁹⁶ Butcher, *Roman Syria*, 13.

⁹⁷ J. Donahue, D.E. Beynon, “Geologic History of the Wadi el Hasā Survey Area,” in *Wadi el Hasā Archaeological Survey*, 29.

The geology of Wadi el Hasā consists of Proterozoic bedrock in the west, formed ca. 800 million years ago, and Upper Cretaceous rock to the east, formed ca. 70 million years ago. Faulting formed the rifts about 50-20 million years ago.⁹⁸ Proterozoic bedrock is only present on the northwestern edge of Wadi el Hasa. The Cretaceous bedrock consists of sandstone, limestone, and phosphorite in the central and eastern regions. Basalts in the central area were produced by lava flow from ocean ridges. The high ridges and deep wadis produce continual soil erosion, especially along steep wadi slopes, but there is little erosion on plateaus and wide terraces. This fact is important in evaluating survey evidence. In areas where erosion is prevalent, artifactual evidence could have been swept downstream from its original context.⁹⁹

The topography of the Southern Ghors and Northeast Arabah survey region has similar traits. The northern area, though, has agricultural fields with silt and sandy areas where Wadi el Hasā flows into and provides a constant supply of water for these plains. As the land rises to the south the tectonic activity has created ridges and wadis. The land to the west is mostly barren with signs of heavy erosion in places while the eastern region is distinguished by various areas of piedmont, wadis and ridges. The terracing along the eastern ridges suffered less erosion than those of the north of this survey region.¹⁰⁰

⁹⁸ J. Donahue, D.E. Beynon, "Geologic History of the Wadi el Hasā Survey Area," in *Wadi el Hasā Archaeological Survey*, 26, 32.

⁹⁹ *Ibid.*, 29-31.

¹⁰⁰ MacDonald, *Southern Ghors and Northeast Arabah Archaeological Survey*, 1.

The Tafila-Busayra Survey region is located along the eastern ridge of Wadi Arabah rift valley and the western edge of the Jordanian desert. The western region is covered by Red Mediterranean soil which is useful for growing a variety of crops, vines, fruit and trees. This soil transitions into Yellow Mediterranean and Yellow Steppe soil from which cereal is grown and cattle grazed. Finally the grey desert soil to the east is mainly flint pavement, with very little organic material, and therefore

practically useless for crops and grazing.¹⁰¹

Over 90% of Jordan's land is considered desert with only about 6%

given to some kind of

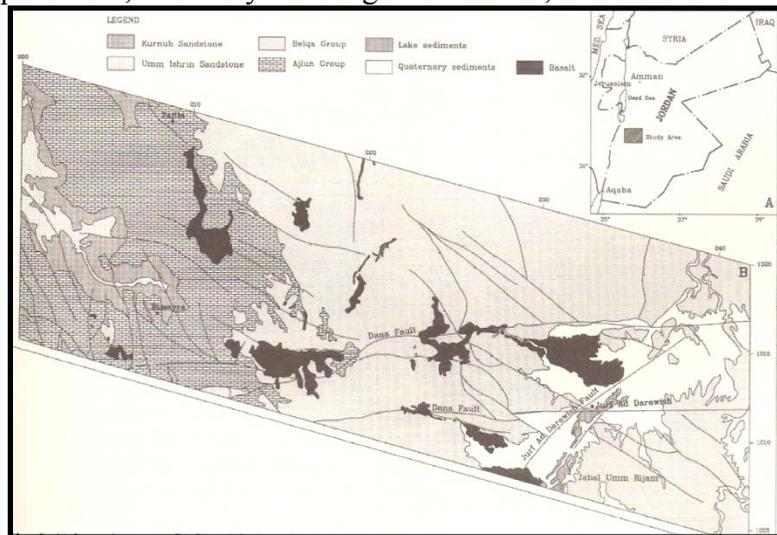


Figure 7: Geological map of Tafila-Busayra

agriculture. Modern Jordan's agriculture lies mainly in the northwest where the Jordan River and the Ghor Canal, parallel to it, provide irrigation for cereals and fruit, especially olives and grapes. Marginal agriculture exists along the modern road through Wadi el Hasā and southward toward Tafila and Busayra. Jordan's economy today is mainly agriculture, tourism, phosphate and mining of potassium from the Dead Sea.

¹⁰¹ MacDonald et al., *Tafila-Busayra Archaeological Survey*, 18.

Aside from some phosphate resources along Wadi el Hasa, the three survey regions have little industry or economic resources.¹⁰²

Today the region has a desert climate, hot and dry in the summer and cool and wet during the short winters. It is only in the northwestern highland slopes that Jordan has a Mediterranean climate.¹⁰³ Donahue and Beynon, members of MacDonald's team during the Wadi el Hasā survey, concluded that the climate of the Wadi el Hasā region was once much wetter than today. They argued that there were alternating 1,000 year cycles of wetter and dryer periods within historic times. They also suggested that the millennium before the present had been an arid period but that during the Roman and Byzantine period, 1st c. BC to 7th c. AD, the area was more humid than today. This would have produced more water flow through the extensive wadis.¹⁰⁴ However, their conclusions are vague and inconclusive, without supporting evidence.

MacDonald concluded that rainfall declines in the Southern Levant moving from north to south. The north, which includes the Ghors and the north-eastern edge of the Wadi el Hasā region, receives more rainfall giving the region a more Mediterranean climate versus the dry desert climate of the majority of the Southern Ghors survey region.¹⁰⁵ Harlan's study of natural resources in the Southern Ghors was invaluable for MacDonald's survey. Harlan reconstructed climatic and agricultural activity during the

¹⁰² Moshe Brawer, ed., *Atlas of the Middle East* (New York: MacMillan Publishing Company, 1988), 124-125.

¹⁰³ Ibid., 124; Victoria Garrett Jones, Judith Klein, eds., *Atlas of the Middle East* (Washington DC: National Geographic Society, 2008), 72-73.

¹⁰⁴ J. Donahue, D.E. Beynon, "Geologic History of the Wadi el Hasa Survey Area," in *Wadi el Hasā Archaeological Survey*, 31-32.

¹⁰⁵ MacDonald, *Wadi el Hasā Archaeological Survey*, 15.

Bronze Age using paleobotanical remains. He also studied current climatic conditions of the area.¹⁰⁶ Harlan stated that the November to April rainy season in the Southern Ghors averages 65 mm and is entirely inadequate for dry farming. Therefore, irrigation is almost always necessary for agriculture. Wadi el Hasā is now and most probably was in the past the most reliable source of water for the area.¹⁰⁷

Harlan is in agreement with Donahue and Beynon that the area underwent a rainier period in ancient times that ended about 2300 BC. He cited evidence from the abandonment of settlements in the Sahara.¹⁰⁸ However, Harlan's article only compares the Early Bronze period to that of modern times; he did not extend his research into the late Roman and Byzantine periods. This limits its specific usefulness to this study but reinforces the information that this area was dry after the Early Bronze period and perhaps beyond.

In their study on climate changes in *The Earth as Transformed by Human Action*, Jill Jäger and Roger G. Barry researched climatic changes over the earth's history. They stated that human activities such as deforestation and overgrazing the land could cause the daily ground temperature to rise. This deforestation also had a negative effect on rainfall. Irrigation also caused salinization, which they noted in modern day Iraq has converted 20%-30% of agricultural land into desert. This could

¹⁰⁶Jack R. Harlan, "Natural Resources" *Wadi el Hasā Archaeological Survey*, 40-41.

¹⁰⁶Harlan, "Natural Resources of the Southern Ghor" in Walter E. Rast, R. Thomas Schaub, "The Southeastern Dead Sea Plain Expedition, An Interim Report of the 1977 Season," *The Annual of the American Schools of Oriental Research*, 46 (Cambridge: American Schools of Oriental Research, 1979), 155-7.

¹⁰⁸ Harlan, "The Early Bronze Age Environment of the Southern Ghor and the Moab Plateau," *Studies in the History and Archaeology of Jordan 2*, A. Hadidi, ed. (Amman: Department of Antiquities, 1985), 127.

have been a factor in ancient Jordan as well where irrigation was vital to a successful growing season. They also maintained that volcanic activity and slight variations in the earth's orbit have caused climactic changes. According to their research, the earth was warmer and more moist from 9,000 to 6,000 years B.P. (7000- 4000 BC) particularly in the desert regions. They observed that since that time, there have been minor 100 year warming and cooling cycles. But Jäger and Barry caution that the lack of accurate record keeping before the 17th century and limited use of new tools, such as proxy climate data, make speculation about ancient climate data imprecise.¹⁰⁹

Because of the need for future study of the ancient climate, researchers must use the witness of ancient authors and archaeological finds to try to understand the ancient climatic conditions. Harlan's study encompassed only a brief period of time in early Bronze Age Jordan and Donahue and Beynon did not give specifics comparing their wetter climate theory with the modern climate. Consequently, despite Donahue and Beynon's evaluation, Harlan's evidence and several ancient sources maintained that the area was largely arid during the Roman and Byzantine era. Diodorus Siculus asserted that the land of Arabia "situated between Syria and Egypt...is partly desert and partly waterless, though a small section of it is fruitful". He also wrote that "in this waterless region, as it is called, they [the Nabataeans] have dug wells at convenient intervals..."¹¹⁰ Procopius wrote that Arabia was "a barren land [that] extends for a

¹⁰⁹ Jill Jäger, Roger G. Barry, "Climate," in *The Earth as Transformed by Human Action*, eds. et al. B.L. Turner II (Cambridge: Cambridge University Press, 1990), 335-349.

¹¹⁰Diodorus, *The Library of History*, 2.47.1-2.

great distance, unwatered and producing neither crops nor any useful things.”¹¹¹

Bowersock stated that the comparable region of the Negev, just across Wadi Araba, “is a singularly waterless and cruel area; but with techniques of irrigation that were well known to the ancients.”¹¹² Unfortunately, the issue of climate in historic times remains controversial, but this thesis will assume that climate in the Byzantine era was broadly similar to modern conditions.

Archaeological sites in Wadi el Hasā are found at all elevations, even those probably less well watered. Generally, however, younger sites are found at lower elevations. MacDonald attributed this to erosion by the wadis and the desire to move closer to the water of those wadis.¹¹³ And it is entirely possible that due to the abundant evidence of soil erosion and redeposition, that older sites at lower elevations simply lie buried under fluvial deposits. Sites in the SGNAS survey area were found near the wadis and in the TBAS survey, many sites were located near springs. All three areas also utilized cisterns and wells. The abundant wadi tributary system allowed water to flow through the area and into Wadi el Hasā, using aqueducts, irrigation, cisterns and wells, people settled throughout the Wadi el Hasā, Southern Ghors and Northeast Arabah, and Tafila-Busayra survey areas.

¹¹¹ Procopius, *Anecdota VI*, trans. H.B. Dewing, The Loeb Classical Library (Cambridge: Harvard University Press, 1935), 357.

¹¹² G. W. Bowersock, *Roman Arabia*, 5.

¹¹³ J. Donahue and D. E. Beynon, “Geologic History of the Wadi El Hasa Survey Area,” in *Wadi el Hasā Archaeological Survey*, 26-39.

E. PRIMARY SOURCES

Primary sources include eye witness accounts or accounts written by those who were contemporaneous of the event for which they wrote. These sources, although inherently biased and subjective, offer historians partial information about places, people and events. Ancient writers recorded events often as propaganda for a favored ruler or against an enemy. As a result, authenticity and accuracy were not essential. Therefore, all ancient writers must always be viewed with some skepticism. But, because there is no alternative to using these sources, caution and open mindedness should proceed when utilizing such works. The following is a brief overview of the more important documentary sources relevant to this thesis.

Strabo was a Greek historian and geographer in the 1st century AD. He travelled extensively throughout the Mediterranean. His *Geography* is valuable because of the variety of subjects, not only including geography but also information regarding the economies of different lands. He also observed and offered opinions about different people, from rulers to commoners, and their supposed origins. His writings are both historical and idealistic geographies. He utilized the resources of earlier writers as well as firsthand experience. He reflected the prevailing Greco-Roman world view, including the sanctioned and accepted bias towards Rome, which by then ruled the entire Mediterranean world.¹¹⁴

¹¹⁴ Strabo, *The Geography* vol. 1, ed. T. E. Page, trans. Horace Leonard Jones, The Loeb Classical Library (Cambridge: Harvard University Press, 1960), xi-xxviii.

Diodorus of Sicily, also a Greek in the Roman Empire, lived in the late 1st century BC. His *Library of History* is often inaccurate and more concerned with a didactic analysis of events. However, he related information from other writers, often now lost, about different areas of the world. He usually relied on secondary sources and sometimes his information is questionable. However, when his information agrees with other sources then his work is a valuable, particularly about the Near East. Roman authors naturally focused on Romans and Italy, rather than the provinces, making such sources as Strabo and Diodorus especially helpful for this study.¹¹⁵

Ammianus Marcellinus was a Roman soldier from 4th century Antioch. A pagan, he wrote a continuous history of thirty-one books but only the last eighteen, covering the late 4th century AD, are still extant. He provided evidence about several provinces, including the Levant. His reports on the Arab *foederati* are helpful because of his firsthand knowledge of them as both allies and enemies. He also wrote about the economy and trade in Arabia.¹¹⁶

Eusebius, (ca. AD 260-340), conversely, was a Christian bishop in Palestine. He reflected an obvious Christian viewpoint. He personally experienced persecutions and emergence of Christianity. As a spiritual adviser to Constantine, he had access and influence over the new Christian emperor's rule. His *Ecclesiastical History* describes the emergence of Christianity. His *Chronicon* lists historical events and the *Life of Constantine* venerates the first Christian emperor. He also wrote the *Onomasticon*,

¹¹⁵ Diodorus, *Library of History* vol. 2, vii-x.

¹¹⁶ Ammianus Marcellinus, *The History* vol. 2, 25.6.10; 25.1.3; 23.6.45-46.

which is of great interest to archaeologists and historians because Eusebius listed Biblical sites and details about them in his own day. This source has been used for centuries to link archaeological sites with ancient sites.¹¹⁷

Procopius, a 6th century historian, is probably the most important Roman historian for the late Byzantine era. He lived during the reign of Justinian I (527-565). His *History of the Wars* and *Buildings* provide a connected narrative of events for this period as well as a wealth of information on the military, forts, other buildings of all kinds, and the Arab tribes of the *foederati*. He is also credited with writing the gossip-laden *Secret History* which sometimes offers a contradictory interpretation in relation to his other writings.¹¹⁸

There are other primary sources with which to glean information on the late Byzantine era. The late fourth century *Notitia Dignitatum* was an official document which contained a detailed list of the units of the Roman army and its deployment and provincial administration. Missing from the *Notitia* for the most part are the local *foederati*.¹¹⁹ But its comprehensive listing of regular military units, ca. 400, is invaluable for comprehending the army's strength and deployment right before the late Byzantine period. In addition to the literary and documentary sources described above,

¹¹⁷ Eusebius, *The Onomasticon*, ed. Joan E. Taylor, trans. G.S. P. Freeman-Grenville, (Jerusalem: Carta, 2003), 1; Eusebius, *The Ecclesiastical History*, ed. G.P. Goold, trans. Kirsopp Lake, The Loeb Classical Library (Cambridge: Harvard University Press, 1926), ix-x, xvii-xx, xxvii.

¹¹⁸ Procopius, *History of the Wars*, ed. G.P. Goold, trans. H.B. Dewing, The Loeb Classical Library (Cambridge: Harvard University Press, 1914), vii-xii; Averil Cameron, *Procopius* (Berkeley: University of California Press, 1985), ix-xiii; Butcher, *Roman Syria*, 73, 165, 266-7, 415-6.

¹¹⁹ Averil Cameron, *The Mediterranean World in Late Antiquity: AD 395-600* (New York: Routledge, 1993), 10, 15, 51, 52; Parker, *Romans and Saracens*, 10.

two collections of papyri are relevant to this study, the Nessana papyri and the Petra Papyri.

Nessana papyri from the 6th and 7th centuries were found in 3 churches and a cemetery in Nessana, in the Negev of southern Israel. These papyri offer insight into the military and economic community in the area under Byzantine rule. A military outpost and stop along a Christian pilgrim route, this town was flourishing according to the severely damaged papyri which included epitaphs, dedications, prayers and commercial documents. The documents were written in Greek; however most of the personal names were Greek transliterations of Arab names.¹²⁰ These documents are important evidence of a thriving region which was close to the survey areas. The Petra Papyri are similar documents from south of the WHS, SGNA and TBAS survey regions.

The Petra Papyri are 6th century AD documents which were carbonized and preserved in a church fire in the early 7th century in Petra, the old Nabataean capital in southern Jordan. These documents were primarily the correspondence and legal documents of an individual family from Petra and its hinterlands. Theodoros, the principal person to whom these documents relate, was a member of the local land-owning aristocracy who prospered greatly from land ownership and cultivation around Petra. These papyri mention farms and olive production in the 6th century. The papyri also mention other wealthy landowners as well. Because Petra is near to the survey area

¹²⁰ George Kirk, C. Bradford Welles, "The Inscriptions", in *Excavations at Nessana*, ed. H. Dunscombe Colt (London: British School of Archaeology in Jerusalem, 1962) 131-197.

and was once a major center of trade (at least in the Roman period) these papyri are an invaluable aid to historical interpretation.¹²¹

Finally, because this paper is dealing with finds from archaeological surveys, this evidence is of the greatest importance. These three surveys recorded various structures, including tombs, towers, caves, roads and inscriptions and collected lithics, pottery sherds and other artifacts. All this evidence combined with geographical, geological and climatic information help to reconstruct the history of the region during the Byzantine era.

F. SECONDARY SOURCES

There are many secondary sources for this region, from historical to geographical to archaeological that undoubtedly enhance the understanding of this area. Modern historians have analyzed the ancient documentary sources in light of both their value and biases. Archaeological research in this study area and that of the region also is crucial in reconstructing patterns of habitation and land use of the survey region. The work of the following modern scholars has proven fundamental for this study.

One must naturally begin with MacDonald himself. His training was in religious studies and Biblical archaeology, with a focus on the Bronze and Iron Ages. He received his PhD from the Catholic University of America. He is currently the Senior Research Professor for the Department of Religious Studies at St. Francis Xavier

¹²¹ Jaakko Frosen, Anitti Arjava and Marjo Lehtinen, eds., *The Petra Papyri I*, *American Center of Oriental Research Publications 4* (Amman, Jordan: American Center of Oriental Research, 2002), 4, 6, 10, 31; Antti Arjava, Matias Buchholz, Traianos Gagos, eds., *The Petra Papyri III* (Amman, Jordan: American Center of Oriental Research, 2007), ix, 34, 132.

University in Nova Scotia. But he also had broad experience in field archaeology in several countries in the region, including Jordan, Israel, Egypt and Cyprus. He also assembled a multi-disciplinary team of specialists to aid him in the interpretation of the wide array of evidence encountered on his surveys, including prehistorians. He should receive particular praise for prompt and full publication of his survey results, an all too rare phenomenon in archaeology. It must be pointed out that MacDonald is not a trained classical archaeologist, which weakens some areas of his argument.¹²²

Kevin Butcher's *Roman Syria*, is a synthesis of the Roman Middle East. He focused on Roman numismatics at the Institute of Archaeology of University College of London where he received his PhD. He was a former professor at the American University of Beirut. He participated in archaeological excavations and continues to be interested in material culture and the ancient economy.¹²³ *Roman Syria* offers an invaluable historical relevant synthesis of the Roman and Byzantine Levant, including social, economic, cultural and military themes.

G.W. Bowersock's *Roman Arabia*, is a standard in the study of the Roman Middle East. He is referenced and quoted by many other Roman scholars because of this work which was first published in 1983. His work is a historical narrative with occasional departures dealing with inscriptions found in the region, but could benefit from most of the recent archaeological work in the region.¹²⁴

¹²² <http://people.stfx.ca/bmacdona/>, accessed Oct. 3, 2009.

¹²³ <http://www2.warwick.ac.uk/fac/arts/classics/staff/butcher/>, accessed October 3, 2009.

¹²⁴ <http://www.thirteen.org/bigideas/bowersock.html>, accessed October 3, 2009

<http://www.oup.com/us/catalog/general/subject/ClassicalStudies/LiteraryCriticism/?view=usa&cj=9780195376678>, accessed October 3, 2009.

S. Thomas Parker's work spans both historical narrative and archaeological excavations. Sources used include, *Romans and Saracens: A History of the Arabian Frontier* and *The Roman Frontier in Central Jordan*. These books not only document his own archaeological excavations in Jordan but incorporate the history of this area under Roman occupation. His publication of ceramics from these projects is useful in assessing the ceramic evidence from MacDonald's surveys.

Jodi Magness's work *The Archaeology of the Early Islamic Settlement in Palestine* is a reinterpretation of the earlier survey evidence from the Nahal Yattir region of Israel. This work is a useful model for reassessing MacDonald's evidence. Her work from just across the 'Arabah sheds light on population and land use from the Roman period into the early Islamic time.

Earlier researchers and travelers to the area also recorded information about this area of Jordan, as noted above. These works, used by MacDonald, add to the understanding of the area, in particular in places where modern development has wiped out the evidence. Other scholars whose works include themes on the Roman economy, laws, the army and trade will also be utilized throughout this study.

CHAPTER 2

This chapter will look at each of the three of MacDonald's surveys, broken into three sections, one for each survey. Each section will follow the same pattern. First, the methodology employed to locate sites and gather artifacts will be explained and information from sites and evidence will be discussed. The final focus of each section will spotlight certain key sites in further detail. Graphs and charts for each survey have been added to better visualize evidence and trends. While this chapter is simply a synthesis of information for the Roman and Byzantine eras, the data will be used in chapter 3 to analyze and draw conclusions about settlement and land use in the Byzantine period.

A. WADI EL HASĀ

I. METHODS

MacDonald divided the survey area into three 'universe' boundaries or region.

¹²⁴ While this was due to accessibility and time constraints, it also seems to have been a natural boundary system in ancient times. All three universes were bounded on the north by Wadi el Hasā and two of the three universes use the modern highway between At Tafilā and Karak for the southern boundary. The west universe boundary is approximately the rift valley on the west and Jebel eth Thamad on the east. The central universe bounds the western universe at Jebel eth Thamad and Wadi el 'Alī to the east.

¹²⁴ Banning, "Methodology," in *Wadi el Hasā Archaeological Survey*, 13.

The western universe was surveyed in 1979 and the central and eastern were surveyed in 1981 and 1982. The methods of site location utilized for this survey were vehicular and purposive pedestrian surveys, and pedestrian transects. The vehicular surveys involved using land cruisers to spot potential sites from roads and navigable land. These methods were useful in the western and central universes. Pedestrian surveys and transects are similar except that the former did not follow a straight line but followed the contours of the land instead. This was the most useful system in the central universe. Pedestrian transects, however, were the most favored and reliable means of site discovery and produced the most prolific finds. Pedestrian transects involved dividing the universes into north to south sections which were traversed by walking teams. These were utilized in the western and central universes.¹²⁶

In the western universe, three person teams covered areas 150m wide, at an interval between teams of ca. 150 m. Larger teams covered areas with larger widths. The western universe was surveyed along natural boundaries and routes which sloped mostly downward to the west, making walking easier. Due to time constraints the western universe transects were not completely covered.¹²⁷

¹²⁶ Banning, "Methodology," *Wadi el Hasā Archaeological Survey*, 13, 17-20.

¹²⁷ *Ibid.*, 18, 21.

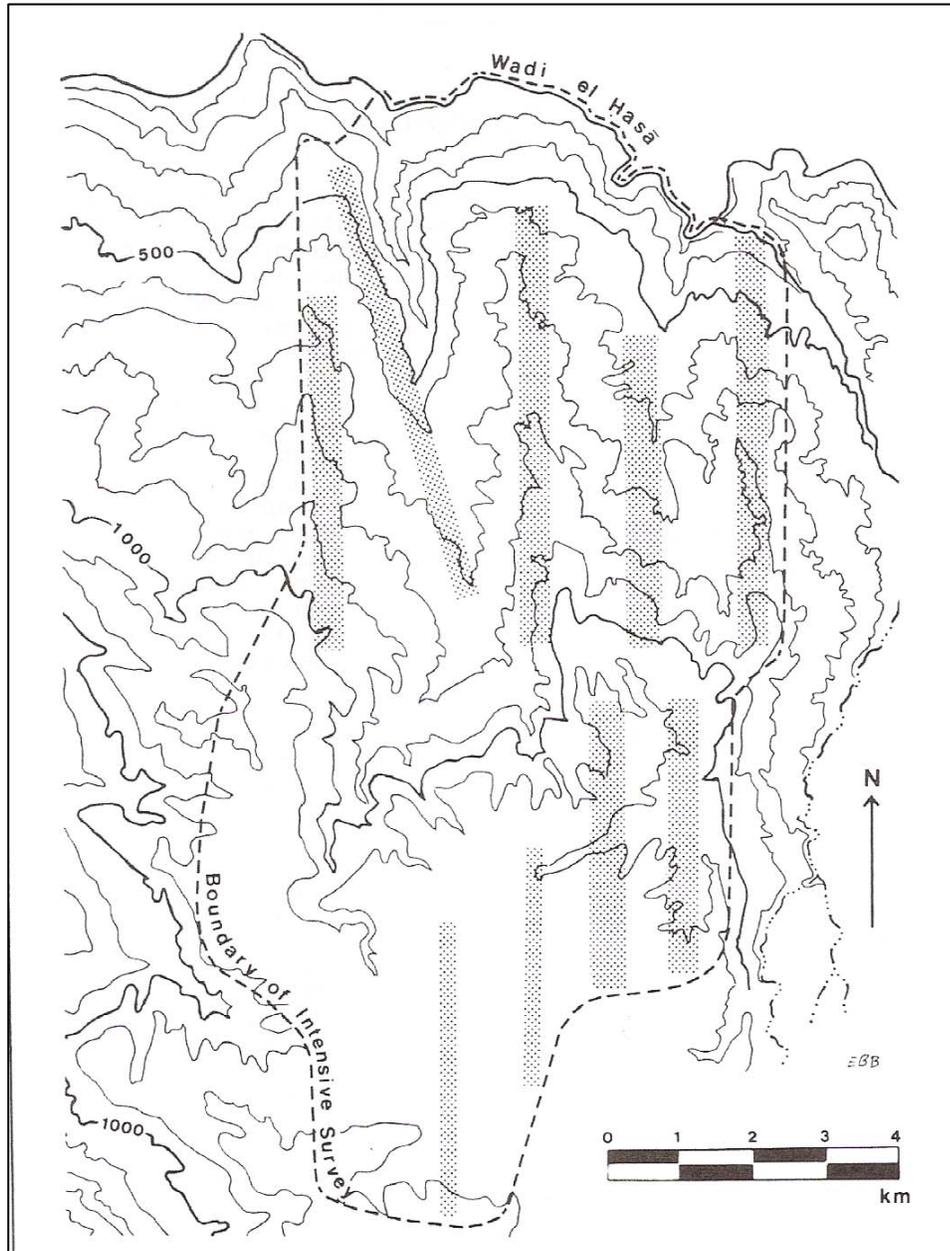


Figure 9: WHS Western Universe, Pedestrian Transects

Pedestrian surveys were used almost exclusively in the central universe. In this universe transects were not systematically distributed but teams followed natural contours of the land. Teams of three or four people used indigenous guides, previous reports or aerial photography to help locate sites.

Originally the eastern universe was divided into uniform grids 145 m wide, each covered by six member teams. The space between transects was 0.5 km. However, it was not possible to cover the area in the time allotted so it was then divided into two sections along the gorge and plateau. Then those sections were divided into 1 km² quadrats, three in the plateau and eight in the gorges.¹²⁸ The teams surveyed the western edge and center of each quadrat.¹²⁹

It is important to remember the nature of archaeological surveys. In this way a large area was investigated to discover human land use over time. This survey was intended to be a preliminary investigation for development of future archaeological research in this little explored part of Jordan. One must proceed with caution when drawing conclusions about the function of sites from survey data. Although such surveys obviously cannot match evidence expected from an excavation, it is the first step in future archaeological investigation.

¹²⁸ A quadrat is an area of land 1 km², as seen by the squares in figure 10.

¹²⁹ Banning, "Methodology," in *Wadi el Hasā Archaeological Survey*, 18, 20.

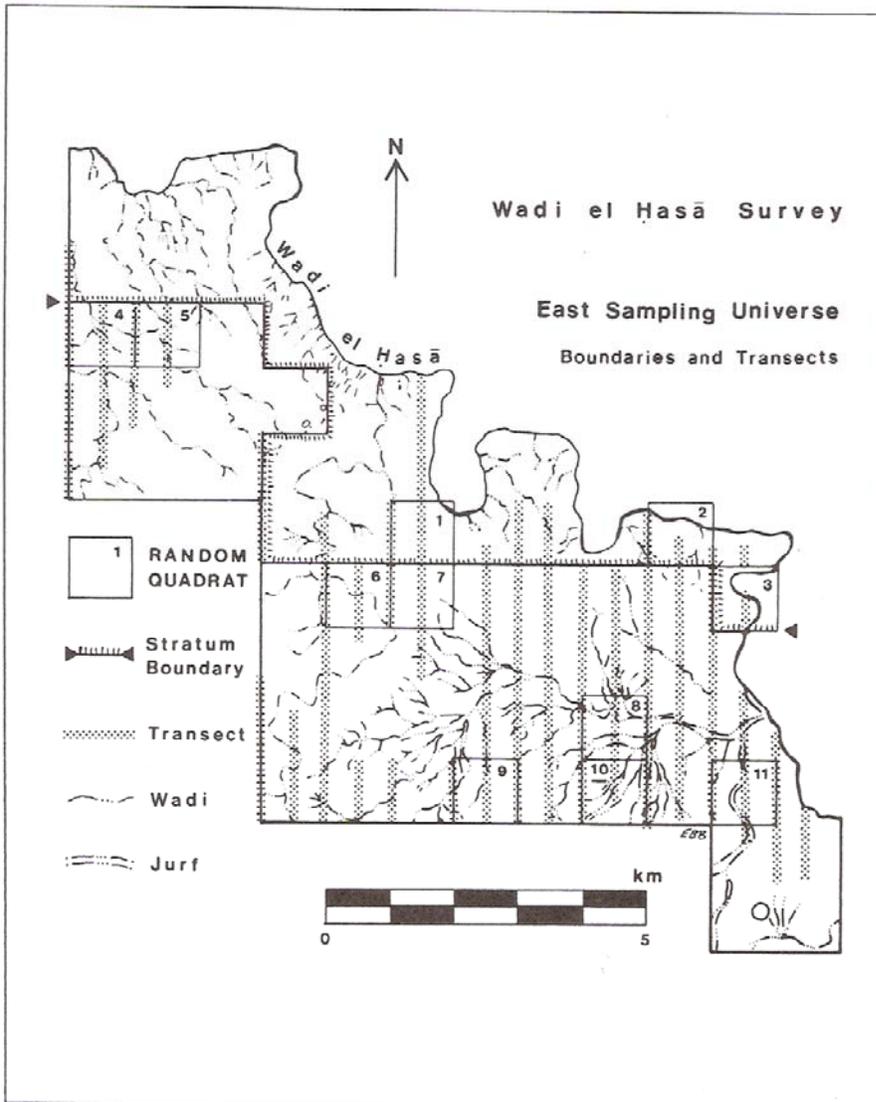


Figure 10: WHS Eastern Universe, Pedestrian Transects

II. EVIDENCE

MacDonald recorded sites from prehistoric times through the late Islamic era. His findings generally concur with periods of intensification and abatement elsewhere in the region. The survey found few Bronze Age sites (ca. 3000 - 1200 BC), corresponding to an abatement, but many from the Iron Age (ca. 1200 - 500 BC). This Iron Age intensification corresponds to the period of the Edomite kingdom. But the periods following the Iron Age, i.e. the Persian (539-332 BC) and Hellenistic (332-63 BC) were characterized by abatement in settlement. Most of these sites lie along wadis with a few sites clustered together. Most Hellenistic sites were located at or near Iron Age sites. This suggests that many sites were abandoned after the Iron Age but a few remained occupied during the Hellenistic era. In other words, new settlements were not established during this era. All told, in the Hellenistic era, MacDonald's survey identified only thirteen sites and seven of these sites had fewer than five sherds. This scarcity of Hellenistic sites suggests the relative depopulation (in terms of sedentary folk) of the area but also suggests continuity of occupation at a few sites from the Iron Age onward.¹³⁰ The evidence indicates farming, particularly olive oil production and cereals in a limited measure. It is reasonable then to conclude that the turbulent fourth through first centuries BC, as empires fought over the wider region and the local Arabs gained independence and strength, was a time of little expansion and small populations within the outlying areas of Wadi el Hasā.

¹³⁰ MacDonald, *Wadi el Hasā Archaeological Survey*, 2, 290-95, 172, 186, 190-93.

There is, however, a note of caution in this interpretation. It now seems clear that the Nabataean ceramic tradition began in the mid to late 2nd century BC. Thus some of the pottery reported as “Nabataean/Early Roman” could actually date to the late Hellenistic period.¹³¹ So the revival of sedentary settlement which characterized the Early Roman period (after 63 BC) may well have begun up to a century earlier as the Nabataeans settled central Jordan. This matter can only be resolved by a re-examination of the relevant ceramic evidence from the survey.

In sharp contrast to the Hellenistic era, the Nabataean/Early Roman period suggests a dramatic increase in sites, mainly concentrated along the wadis and the main Roman road, the *via nova Traiana*. Sites include remains of mills, cultivated fields and many towers and other fortified sites. This coincides with the period of consolidation and expansion of the Nabataean kingdom throughout the area.¹³² When the kingdom was annexed by the Romans in AD 106 the Nabataeans, and their descendents, continued living in the area long after. A total of 33% of sites which could be identified were associated with fortresses or watchtowers during the Nabataean era and 40% during the Nabataean/Early Roman era. Shahîd maintained that Trajan’s annexation of the area helped to create this intricate system of forts along the *via nova Traiana*.¹³³ But the Romans seemingly enhanced a pre-existing Nabataean system. This provided the Nabataeans and Romans with lookout positions to monitor traffic along the wadis

¹³¹ Parker, *The Roman Frontier in Central Jordan*, 527; Philip C. Hammon, “Nabataean Architectural Technology,” in *Studies in the History and Archaeology of Jordan* 5, Khairieh Amr, Fawzi Zayadine, Muna Zaghoul, eds. (Amman: Department of Antiquities, 1995), 216, 220.

¹³² MacDonald, *Wadi el Hasā Archaeological Survey*, 292.

¹³³ Irfan Shahîd, *Rome and the Arabs: A Prolegomenon to the Study of Byzantium and the Arabs* (Washington DC: Dumbarton Oaks Research Library and Collection, 1984), 20.

and *via nova Traiana* and bases in which to station troops to provide regional security. The *via nova Traiana* formalized a major trade route that brought prosperity to the region.¹³⁴ But the road may well have had strategic purposes as well. Bowersock, for example, argued that the *via nova Traiana* was “part of Trajan’s master plan for conquest of the Parthians”, launched just a few years after the annexation.¹³⁵ The Nabataean and Early Roman sites indicate extensive use of the wadis for fortifications and consistent use of the Roman road.

The land surrounding these sites was utilized for farming. Apparent farms are spread throughout the survey area but their density is uncertain because so much remains unidentified.¹³⁶ MacDonald only definitively identified ten sites as farms, often with associated terracing, with seven more identified as either possible villages or farms for the Nabataean, Roman and Late Roman periods. He identified 28 towers, eight of which are directly associated with the *via nova Traiana*, with most of the remaining situated along the wadis.¹³⁷ Banning, an associate of MacDonald’s, suggested that these towers had “agricultural functions” and should be broadly dated to the Roman and Byzantine periods.¹³⁸

All told the survey dated 363 sites to the Nabataean-Late Roman period, of which 231 (63.6%) yielded five or more sherds of this period. This suggests a period of frontier expansion and/or nomadic settling. The growth of sedentary settlement

¹³⁴ Parker, *The Roman Frontier in Central Jordan*, 2:529.

¹³⁵ Bowersock, *Roman Arabia*, 84

¹³⁶ MacDonald, *Wadi el Hasā Archaeological Survey*, 201-229.

¹³⁷ *Ibid.*, 193-231.

¹³⁸ Banning, “Methodology”, *Ibid.*, 25.

suggests that the security provided by the Nabataean and later Roman governments (whether through fortifications and/or diplomacy) provided opportunity for expansion. By the Late Roman times (ca. AD 135-324), probable watchtowers accounted for 20% of sites, down from 40% during the Nabataean /Early Roman era.

Site discussion

The evidence from the Byzantine period, however, suggests a dramatic decrease in settlements and a different pattern of settlement. Settlement was now concentrated on the western plateau, with only a few clusters of sites along a few wadis to the east. Most problematic is the lack of evidence for a Byzantine presence along the *via nova Traiana*.¹³⁹ This might suggest a decline in use of the road for troops or trade. Probable watchtowers accounted for 18% by the Byzantine era, down slightly from the 20% during the Late Roman period. All other sites along this route were seemingly abandoned. Many sites seem to be farms or stone piles, the latter suggesting field clearance for agricultural purposes. Site 70 at Al Haba is characteristic of the survey's Byzantine finds. It consists of several structures; a cistern associated with a spring,¹⁴⁰ and was in use as a farm when surveyed. The Byzantine sites are smaller compared to earlier sites. The settlement pattern suggested to MacDonald that the people in the Byzantine era did not use the wadis or the *via nova Traiana* as earlier folk had.¹⁴¹

¹³⁹ MacDonald, *Wadi el Hasā Archaeological Survey*, 232.

¹⁴⁰ *Ibid.*, 241.

¹⁴¹ *Ibid.*, 248.

The evidence from the WHS region is consistent with LaBianca's concept of intensification and abatement. There are questions, however, about the accuracy of this general view. The Iron Age findings certainly demonstrate an intensification as the land of Edom was established and settled. The Hellenistic evidence also attests to abatement and perhaps turmoil experienced by the inhabitants who may have fled settlements during this time. Questions remain unanswered for date of the Nabataean settlement. Ceramic dating has developed significantly since the WHS publication. Pottery evidence needs to be re-evaluated to differentiate Hellenistic, Nabataean and Early Roman ceramics. But the Roman Period has considerable documentation for the buildup of the borders and subsequent need for supplies and settlements. The Byzantine Era historically was characterized by a period of abatement, but a closer look at the WHS evidence is required.

Table 1: Wadi el Hasā Sites by Period

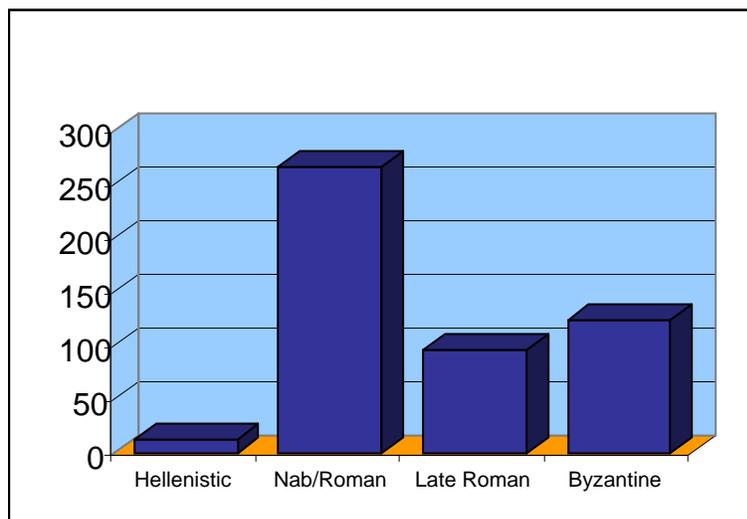


Table 2: WHS Site Types

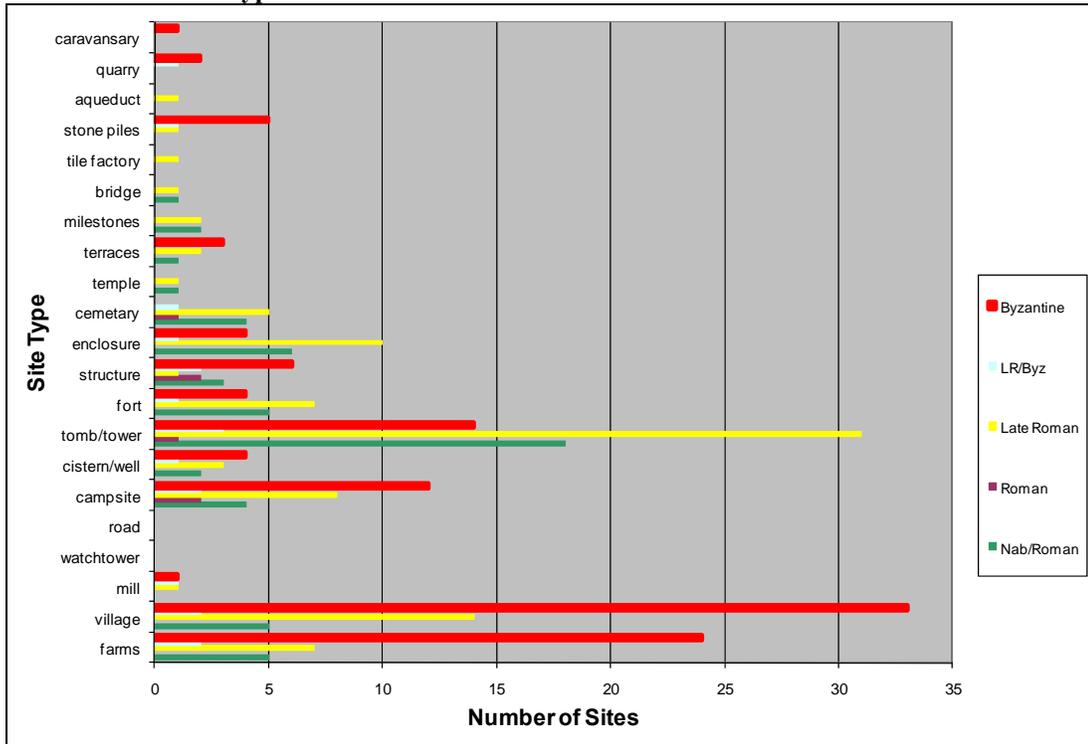
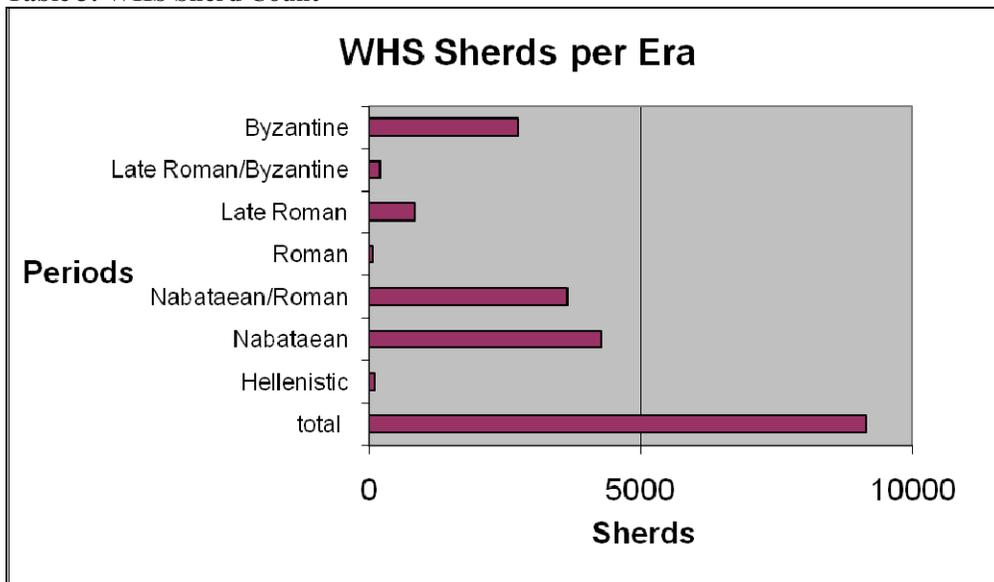


Table 3: WHS Sherd Count



a. WHS Central and Eastern Universes

The Byzantine evidence presents a different image of settlement than the earlier Nabataean and Roman eras. The survey identified 125 Byzantine sites. Of these 90 (72%) had 5 or more sherds and 35 (28%) had fewer than five sherds. The Nabataean through Late Roman eras had almost three times as many sites as the Byzantine era. At first, this would seem to suggest that the Byzantine period represented a decline in sedentary population but one must also consider the total area that the sites encompassed.

MacDonald's division of the area into three universes, western, central and eastern, presents more specific site distribution. The few Hellenistic sites were sparsely scattered throughout all three regions with no apparent link among them. The Nabataean and Roman settlement spread out throughout all three universes at a much higher level. But a change in the settlement pattern is apparent in the Byzantine period. The western universe has a concentration of sites while the central and eastern are almost devoid of settlements apart from small clusters of sites. These sites will be discussed separately due to their separation and apparent isolation from each other.

The eastern universe had a cluster of sites in the southeastern corner of the survey area along Wadi Abu de Diba, which forks to the south of Wadi el Hasā. Of these 14 sites, ten had more than five Byzantine sherds. Four of these, 599, 601, 674 and 725, were identified as fortresses, watch towers and caravansaries. Glueck interpreted er-Ruweihah (MacDonald's- site 674), as a fortress at the eastern end of a

long line of such fortresses along Wadi el Hasā.¹⁴² Just south of this cluster of towers is a rock quarry two kilometers east of a Late Roman alabaster quarry. North of this cluster is a Nabataean village, site 892, or stopping spot along an ancient road continually used into the Byzantine period. MacDonald suggested that the ancient route passed through this cluster from the eastern desert region to the northwestern plateau. Although established in the Nabataean era, it seemed to still be in use in the Byzantine era. The eastern universe in the Byzantine period included an ancient road, perhaps to facilitate transport and still in use, with watch towers and possible quarrying activity close by.¹⁴³

The central universe included two groups of Byzantine sites with twenty sites in all; ten of these sites had over five Byzantine sherds each. These latter include sites 313, a tower at the convergence of two wadis, 375 with several towers, 362 and 604, both associated with millstones and 362 with an aqueduct. Sites 375, 313 and 362 are clustered near each other. Site 604, which was settled in the Iron, Hellenistic and Roman eras, seemed to be in continual use through the Byzantine period.¹⁴⁴ There are nine other Byzantine sites with over five Byzantine sherds clustered around this site. Of these, three (763, 654 and 656), were farms/villages; site 656 had an aqueduct, and terracing dating back to the Nabataean era.¹⁴⁵ The others include a tomb and a camp, while the purpose of four sites could not be definitely identified.¹⁴⁶ Although this area

¹⁴² Glueck, *Explorations in Eastern Palestine II*, 106.

¹⁴³ MacDonald, *Wadi el Hasā Archaeological Survey*, 208-210, 238, 247-8.

¹⁴⁴ *Ibid.*, 244, 246, 237, 239.

¹⁴⁵ *Ibid.*, 219.

¹⁴⁶ *Ibid.*, 207, 219, 246, 380, 381.

appears sparsely populated, the watermills in each of these two clusters suggest agricultural activity during this time.

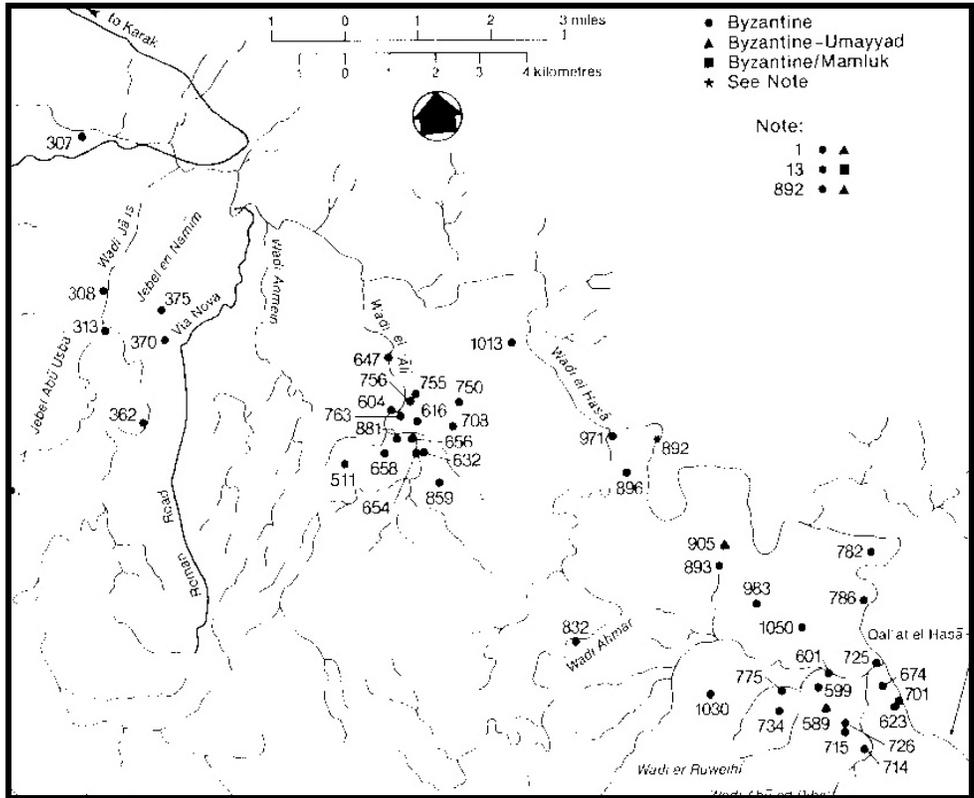


Figure 11: WHS, Central and Eastern Universes - Byzantine Sites

b. WHS Western Universe

The total number of Byzantine sites in the western universe is 111, compared to 73 Nabataean and Roman sites in the same region. This is noteworthy since the Nabataean and Roman periods overall had many more sites in the entire survey region. The western region therefore reflected a higher settlement count in the Byzantine period than in the Nabataean/Roman.

Six Nabataean and Roman sites in the western universe were identified with the fortification system and seven others were categorized as villages/farms or terracing. Only four Byzantine sites were classified as some kind of fortification but six were related to farming. There were four other sites with cisterns in this universe, one of which, site 23, was also associated with a quarry. Glueck observed extensive ruins and cisterns or cave/cisterns at this site and in his day it was surrounded by agricultural fields. He reported Nabataean, Roman and Bronze Age pottery. He also claimed that this site was on a Bronze Age trade route extending all the way to Tafilā in the southwest.¹⁴⁷ There were also the remains of twelve mills in this universe, all but one east of the agricultural areas. Therefore, the western universe during the Byzantine period had a high concentration of sites identified with farming, cisterns and mills.

Wadi Afra was especially densely populated during the Byzantine period. Most mills lie at the northern-most end of this wadi where it flows into Wadi el Hasā. Sites 89, 104, and 169 were mills along this wadi with Byzantine sherds.¹⁴⁸ Mill sites 85 and

¹⁴⁷ Glueck, *Explorations in Eastern Palestine II*, 107- 108.

¹⁴⁸ MacDonald, *Wadi el Hasā Archaeological Survey*, 235.

167 had Late Roman and nearby site 52 had only Nabataean sherds and none were found at mill sites 57 and 214.¹⁴⁹ They were bordered on the north and south by towers at sites 169 and 210; 169 could also have been a mill site.¹⁵⁰ The southern-most portion of the wadi was dotted with towers and farms. Sites 1 and 6 were associated with these fortresses and farms.¹⁵¹

The southern portion of Wadi La'ban, west of Wadi Afra also included several mills and towers, sites 276, 277, 278, 279 and 281.¹⁵² The area along a modern road in the western-most portion of this universe was the most populated portion of the western universe. Sites 170, 171 and 184 are modern villages built over ancient remains. Although the predominant pottery at these sites was Ottoman to modern, Byzantine sherds were found as well. In 1935 Glueck found that these villages were covered by so much modern rubble that he could not determine past habitation at all.¹⁵³ Sites 172 and 177 appear to be remains of villages, with signs of ancient terracing. One site, 172, described by Glueck as a village was subsequently destroyed by the modern road; most sherds MacDonald found there were Byzantine.¹⁵⁴ Many other sites near this road were nondescript sites with predominantly Byzantine sherds. There were also many cisterns but no mills associated with this western-most region.¹⁵⁵

¹⁴⁹ MacDonald, *Wadi el Hasā Archaeological Survey*, 194, 222-23.

¹⁵⁰ *Ibid.*, 242, 244.

¹⁵¹ *Ibid.*, 238, 240.

¹⁵² J.W. Betlyon, G. King, M. Piccirillo, B. MacDonald, "Artifacts of Special Interest", *Ibid.*, 288.

¹⁵³ Glueck, *Explorations in Eastern Palestine II*, 100.

¹⁵⁴ MacDonald, *Wadi el Hasā Archaeological Survey*, 232, 238.

¹⁵⁵ *Ibid.*, 238.

B. SOUTHERN GHORS AND NORTHEAST ARABAH

I. METHODS

After completing the Wadi el Hasā surveys, MacDonald was curious about the relationship between Wadi el Hasā and the Southern Ghors and Northeast Arabah, the region south of the Dead Sea, particularly transhumance between the two as well as the Negev to the west.¹⁵⁶ Therefore Macdonald surveyed the Southern Ghors and Northeast Arabah in 1985 and 1986. The northern boundary was al Safi and the southern boundary was Wadi Fidan. The survey area was divided by topography into five categories: agricultural land, gravel, sand, piedmont and wadi beds/ridges. These categories determined the extent of investigation and methodology. Easily reached areas were investigated more thoroughly.

In the southern portion of the survey area, the blue area in figure 13, the difficult landscape made it prudent to use aerial photography maps to determine key architectural sites near the 'Old Road'. This also saved valuable surveying time. Subsequently, only previously identified sites were investigated by the SGNAS team members. In the northern area, marked in green in the figure, topographical and aerial maps were used to select sites to be surveyed. Pedestrian transects were the most productive ways to find sites in all areas. In pedestrian transects team members were spaced anywhere from 5 to 20 meters apart in groups of two to six people. In difficult terrain, e.g. wadi ridges, team members followed foot or goat paths or any passable

¹⁵⁶ MacDonald, *Southern Ghors and Northeast Arabah Archaeological Survey*, 4.

terrain. SGNAS teams also visited previously documented sites collecting sherds at each; this purposive surveying technique was widely used in the SGNAS area because of the abundance of earlier archaeological work in parts of the survey region.¹⁵⁷

MacDonald acknowledged some shortfalls of the survey. First, accessibility was a constant issue. The difficult terrain such as steep ridges and deep wadis, made it difficult to record sites accurately and frequently impossible to transport artifacts. Also, sand dunes near the ‘Old Road’ made travel, even by vehicle, impossible at times. Because many previously unknown sites were discovered when moving through difficult topography from one known site to another, the teams had less opportunity to find new sites.¹⁵⁸

Furthermore, the survey evidence itself is problematic. As with all other surface surveys, SGNAS collected artifacts and recorded structural evidence visible on the surface. The Jordanian government began developing this area in 1977, and since then much archaeological evidence has been destroyed, including many of the sites MacDonald’s team recorded. The surface finds of this survey are all that remains of archaeological evidence for much of the area, therefore definitive analysis of many of these sites will be impossible for future researchers.¹⁵⁹

¹⁵⁷ MacDonald, *Southern Ghors and Northeast Arabah Archaeological Survey*, 9-12.

¹⁵⁸ *Ibid.*, 10-11.

¹⁵⁹ *Ibid.*, 4, 9.

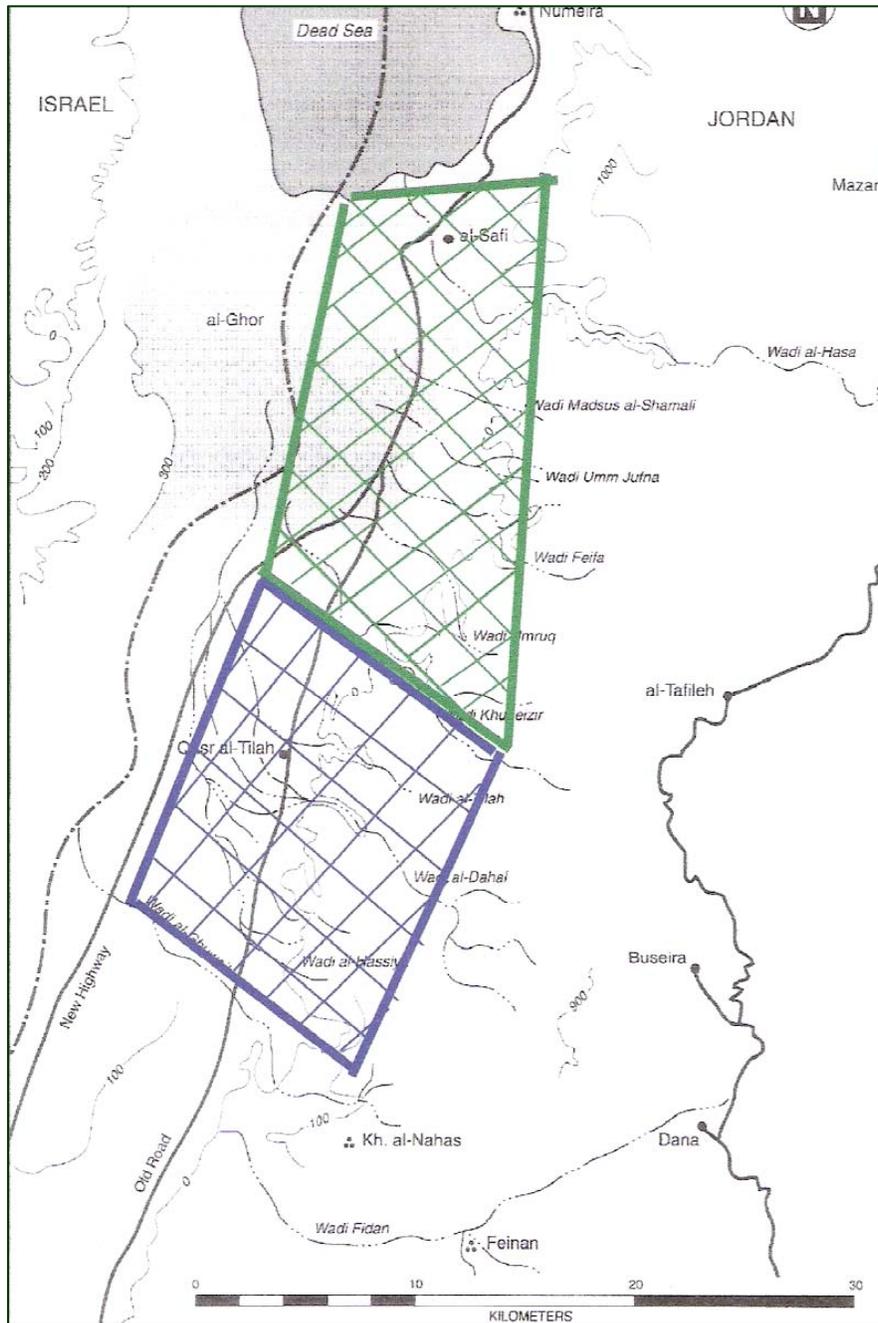


Figure 13: SGNAS Region

II. EVIDENCE

The evidence from the SGNAS region ranged from prehistoric through Ottoman period sites, just like the WHS survey. The periods of intensification and abatement were similar in both studies. However the differences were less distinct in the SGNAS study. One of the sharpest contrasts was the Early Bronze period (ca. 3300-1950 BC) time of intensification. But the Middle and Late Bronze Ages (ca. 1950-1200 BC), like the WHS, produced no reported evidence by MacDonald.¹⁶⁰ There was evidence that the ‘Old Road’ was used during the Bronze Age and subsequently was an important artery. Intensification in the Iron Age, just as the WHS, is associated with Edom. Transhumance is evident in this era by routes along Wadi al-Dahal to the WHS area.¹⁶¹ At this time copper mining probably brought many settlers and workers. This mining activity continued through the historic eras.

Once again, the Hellenistic era was a time of abatement. Most sites were abandoned. But several new settlements were established. Surprisingly settlement only increased slightly in the Nabataean and Roman periods. Literary sources indicate industry in mining and asphalt during this time but the artifactual evidence does not support it. Byzantine evidence was the greatest for SGNAS. There were many villages and camps. Byzantine sites are scattered throughout the region along the ‘Old Road’ and wadis. The villages would have been supported by an agricultural hinterland. The roads offered readily available trade routes for surplus goods or import of needed

¹⁶⁰ MacDonald, *Southern Ghors and Northeast Arabah Archaeological Survey*, 71, 159.

¹⁶¹ Transhumance is the seasonal movement of people and livestock for optimal grazing use of land in different locations.

commodities. The source of adequate water for the settlements and fuel for smelting activity remains a mystery.

The Early Bronze Age evidence is a departure from the expected abatement. There were 19 Early Bronze sites clustered along the ‘Old Road’ near Wadi Khuneizir and Wadi al-Nukhbar in the middle of the region.¹⁶² This indicates that the road was utilized not only by the settlements but perhaps also as a trade route. Sites were also clustered near al Safi and Feifa in the northern survey area which included villages and ancient agricultural fields.¹⁶³ MacDonald indicated that a large cemetery nearby was an anomaly for the study areas, where only small cemeteries existed.

The intervening years of abatement (ca. 1900-1200 BC) were followed by intensification during the Iron Age (ca. 1200- 500 BC) corresponding to the time of the Edomite kingdom. There were fewer sites along the ‘Old Road’ near Wadi Khuneizir and Wadi al-Nukhbar in the middle of the survey area but more Iron Age sites along Wadi al-Dahal to the south.¹⁶⁴ MacDonald argued that Wadi al-Dahal was an access route for transhumance between the WHS and SGNAS.¹⁶⁵ Further south, sites east of the ‘Old Road’ along Wadi al-Ghuweib are associated with mining activities throughout the Iron period.¹⁶⁶ Glueck found many such sites along this wadi, many substantial with large furnaces, ruins of possible watchtowers and miners’ huts. A dilemma Glueck noted was the lack of fuel for the furnaces. Importing fuel in the form of coal and

¹⁶² MacDonald, *Southern Ghors and Northeast Arabah Archaeological Survey*, 62, 68-9.

¹⁶³ *Ibid.*, 70.

¹⁶⁴ *Ibid.*, 74-5.

¹⁶⁵ *Ibid.*, 78-80.

¹⁶⁶ *Ibid.*, 73-4, 80.

foraging the larger area for dried shrubs were two possible scenarios. Both of these are labor or cost intensive, and yet the number of smelting sites attested to this significant activity.¹⁶⁷ A natural resource of the area, copper, was mined heavily during the Iron Age especially along the eastern portion of Wadi al-Ghuweib but apparently not in the Bronze Age.¹⁶⁸

Following the Iron Age, similar to the WHS, the Persian and Hellenistic eras were periods of abatement according to MacDonald. The SGNAS reported no Persian sites, seven Hellenistic sites and two Late Hellenistic/Early Roman sites. Unlike the WHS survey, most Hellenistic sites were not established during the Iron Age.¹⁶⁹

The Nabataean/Roman era sites (n=44) also were a departure from the WHS findings. This relatively small number differs from the substantial increase in sites from Hellenistic to Roman in the WHS. It was well known that both copper mines in the area and asphalt from the Dead Sea, as latter documented by Diodorus, were being exploited in this period.¹⁷⁰ But this apparently did not encourage a dramatic increase in settlements. There was only one Late Roman smelting site, 30, along Wadi Fidan. Glueck found no slag at this site and therefore questioned Frank's report of slag heaps here. Glueck asserted that the copper mining and smelting sites were east and south of the acropolis of this site. When Glueck visited this site it was above the wadi but MacDonald, fifty years later, found it was an island in the middle of the wadi.¹⁷¹

¹⁶⁷ Glueck, *Explorations in Eastern Palestine II*, 22-29.

¹⁶⁸ MacDonald, *Southern Ghors and Northeast Arabah Archaeological Survey*, 71, 80.

¹⁶⁹ *Ibid.*, 83.

¹⁷⁰ Diodorus, *The Library of History*, 19.98.

¹⁷¹ Glueck, *Explorations in Eastern Palestine II*, 20-22.

SGNAS collected Chalcolithic (4500-3300 BC), Early Bronze (3300-1950 BC) and Iron II (918-539 BC) pottery from this site.¹⁷² The area between Wadi Khuneizir and Wadi al-Nukhbar was re-occupied in the Hellenistic and Nabataean periods. The area east of Feifa witnessed settlement through all periods except the Middle and Late Bronze Age. Although Wadi Fidan was still occupied in the Nabataean/Roman period, there were fewer sites than in either the Early Bronze or Iron Ages.¹⁷³

While Shahîd, Bowersock and Banning suggested that the dramatic increase in sites in WHS during the Nabataean/Roman periods was due to the military buildup on the desert fringes, the SGNAS area, well west of the frontier, did not experience the same growth. Likewise, when the security provided by the military installations in the marginal areas was removed in the Late Byzantine era, the WHS area saw some abandonment in the more eastern areas closest to the desert. But the SGNAS area, in closer proximity to the Roman army and allied federates, witnessed more settlements.

Site discussion

SGNAS recorded 65 Byzantine sites, the most of any era. Like the WHS, all data was reported under the broad heading of Byzantine, (ca. 324-640) except a few sites where occupation was divided into Early Byzantine (ca 324-491) at sites 46, 66 and 79H and Late Byzantine (491-640) at sites 29, 30, 66, 205, 211 and 216. However, only site 211 had only Late Byzantine sherds.¹⁷⁴ Of the 65 sites, SGNAS teams collected less than five sherds per site at 15 of them, therefore the publication was

¹⁷² MacDonald, *Southern Ghors and Northeast Arabah Archaeological Survey*, 79, 94.

¹⁷³ *Ibid.*, 62, 74, 84.

¹⁷⁴ *Ibid.*, 97-99,

focused on the 50 other sites. These lie near wadis or close to the ‘Old Road’. Because of modern construction, many sites in the Southern Ghors have been destroyed leaving behind only sherd scatters.

In the Southern Ghors, there were two major ecclesiastical sites, 46 (Deir Ain Abata) east of al-Safi and site 7 to its south. Both sites had a wealth of architecture and Byzantine artifacts. MacDonald noted that one of these two sites could be the Church of St. Lot depicted on the 6th century Madaba Map of Palestine, a suggestion now established by subsequent excavations.¹⁷⁵ Near the Hermitage at site 7 was a Nabataean built fortress which was occupied during the Byzantine era.¹⁷⁶

Further south are sites near Feifa, Wadi Umm Jufna, and Wadi Feifa. Three indicate possible agricultural activity.¹⁷⁷ Site 91, at the juncture of the ‘Old Road’ and Wadi Feifa was a village, associated with modern Feifa, in use from the Byzantine to Islamic periods. There was also a millstone at this site but both MacDonald and Glueck dated this mill to later Islamic periods.¹⁷⁸

There were 22 Byzantine sites scattered throughout the middle of the survey area from Wadi Khuneizir to Wadi al-Dahal. Most of these were graves, sherd scatters, or probable camp sites, in the floodplains. But site 211 was a major village dating to the Nabataean period; however most of its pottery was Byzantine. MacDonald found it curious that this site and its hinterland were occupied during this period when site 155,

¹⁷⁵ Konstantinos D. Polotis, “Of Agios Lot at Deir Ain Abata, Jordan,” *Bible and Spade* 12 (1999), 87–89. Site 46, Polotis determined, at Deir Ain Abata, was the church of St. Lot.

¹⁷⁶ MacDonald, *Southern Ghors and Northeast Arabah Archaeological Survey*, 97-104.

¹⁷⁷ *Ibid.*, 104, 258, 262.

¹⁷⁸ Glueck, *Explorations in Eastern Palestine II*, 9-10.

only ca. 3 km away, had been a major village, fort and agricultural area in the Nabataean and Roman period.¹⁷⁹ However, there were few Byzantine sherds collected from this nearby Nabataean site, 155. The continual presence of human activity along Wadi al-Dahal suggests that this was a major artery for transportation between this area and the WHS area throughout the survey periods.¹⁸⁰

The most interesting Byzantine evidence was south of Wadi al-Dahal east of the ‘Old Road’ between Wadi al-Hassiya and Wadi al-Ghuweib. Of the 14 recorded sites, six were Byzantine villages. Four village sites, 233, 227, 216, 87 were located at or near Early Bronze Age sites. Slightly to the north, site 232 was a Byzantine village built over a Nabataean site. Grinding stones were found at five of the six villages. To the west, along Wadi al-Ghuweib, was another Byzantine village (Khirbet al-Ghuweib) and sherd scatter, sites 161 and 160, which were located at Iron Age smelting centers. This area was the most densely populated area during the Byzantine period, according to pottery and architectural evidence. However, Glueck only reported finding Iron and Nabataean sherds at this site.¹⁸¹ Here also, MacDonald questioned why there were so many Byzantine sites in such an arid zone.¹⁸² Glueck also brought up this anomaly in his report of the area, he wondered about the source of water for the communities as well as fuel for the smelting furnaces, as discussed earlier.¹⁸³

¹⁷⁹ MacDonald, *Southern Ghors and Northeast Arabah Archaeological Survey*, 89, 105.

¹⁸⁰ *Ibid.*, 105.

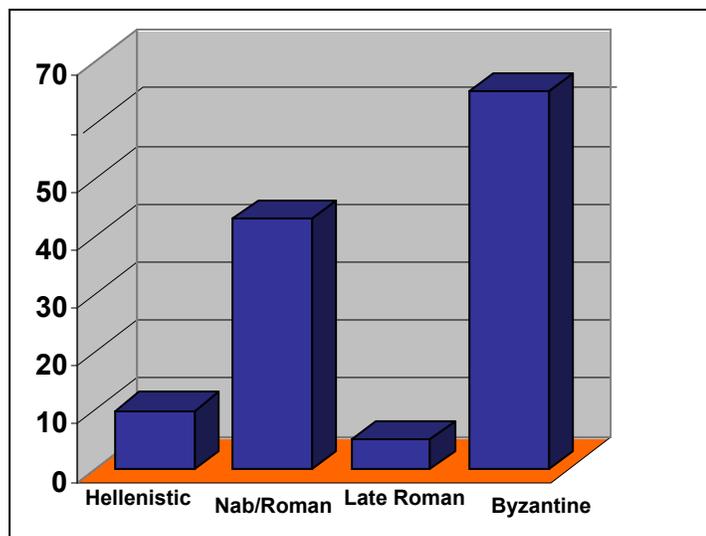
¹⁸¹ Glueck, *Explorations in Eastern Palestine II*, 22-23.

¹⁸² MacDonald, *Southern Ghors and Northeast Arabah Archaeological Survey*, 105, 108, 111.

¹⁸³ Glueck, *Explorations in Eastern Palestine II*, 25-26.

Another small area of settlement lies just to the south at the convergence of the ‘Old Road’ and Wadi Fidan. In the Early Bronze, Iron and Nabataen/Roman eras this area was densely occupied. However, there were only four sites with Byzantine artifacts: 56, 29, 118 and 30. Aside from graves and sherd scatters, site 30 had the only structures. The presence of circular structures, possible hearths, and slag in and around these structures could indicate pottery production. This site was located on an island which has formed in Wadi Fidan. However the predominant artifactual evidence was Early Bronze.¹⁸⁴

Table 4: SGNAS Sites by Period



¹⁸⁴ MacDonald, *Southern Ghors and Northeast Arabah Archaeological Survey*, 59, 94, 111.

Table 5: SGNAS Site Types

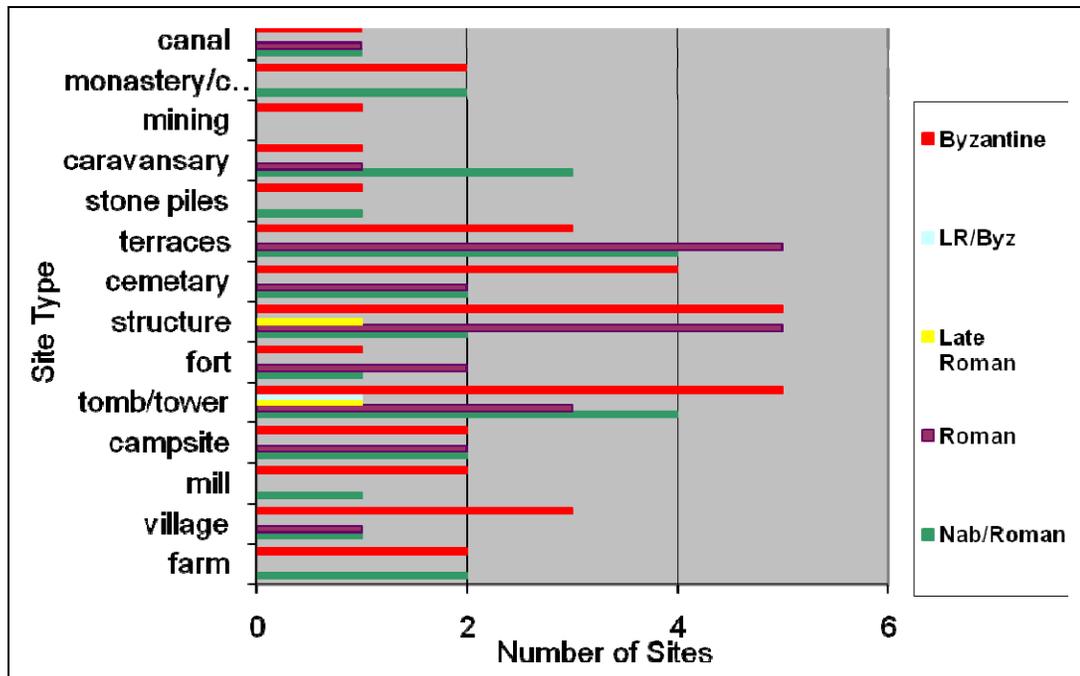
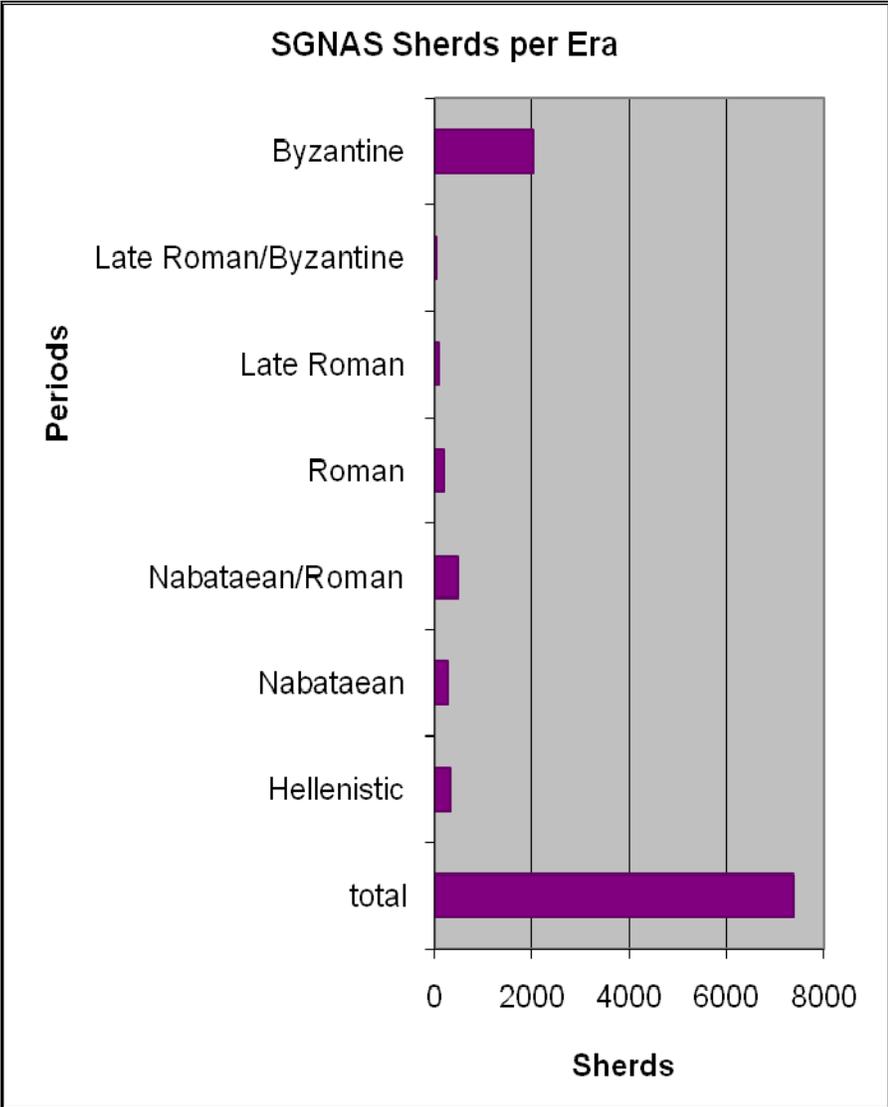


Table 6: SGNAS Sherd Count



B. TAFILA-BUSAYRA SURVEY AREA

I. METHODS

The borders of the Tafila-Busayra survey region were the cliffs ca. 20 km from Wadi Arabah to the west, the modern highway on the north and an east-west route south of Busayra and north of Jurf ad-Darawish on the south. The eastern border was ca. 5 km from the north-south desert highway.¹⁸⁵

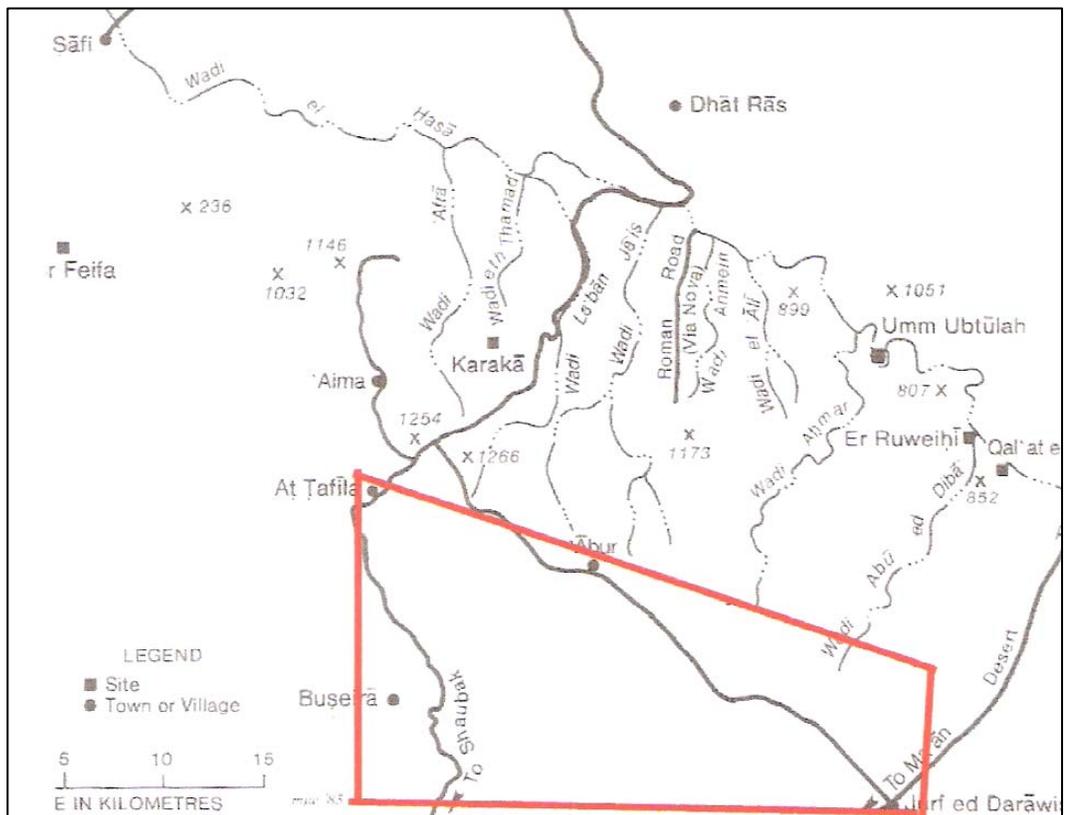


Figure 14: Tafila-Busayra Archaeological Survey Region

¹⁸⁵ MacDonald, *Tafila-Busayra Archaeological Survey*, 3-5.

The Tafila-Busayra survey region was divided into zones according to topography. The gorges, zone 1, were on the western side of the region where the wadis flow toward the Southern Ghors. Zone 2 was the Edomite Plateau covering most of the central region and zone 3 was the eastern most section, the desert. MacDonald also separated out the hinterland of Busayra into zone 4; this area encompassed an area 3 km² around the Citadel. Zone 4 therefore borrowed from both zones 1 and 2. Zone 5, the Pleistocene lakes, was outside of the original survey area but in the Jurf ad-Darawish region, an area of interest to the team. Evidence from this zone, however, was not discussed in much detail in the TBAS publication. Connecting the TBAS region with the Southern Ghors and Northeast Arabah areas, MacDonald also surveyed along a road from southwest of Busayra northwest to Wadi Arabah, also outside of the original survey area.¹⁸⁶

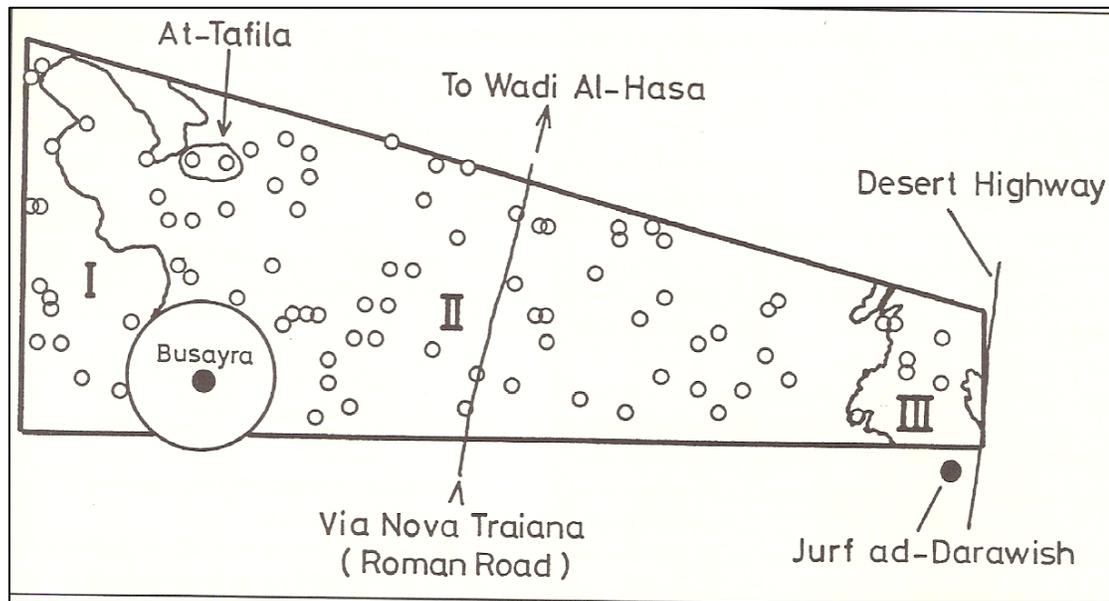


Figure 15: TBAS Zones

¹⁸⁶ MacDonald, *Tafila-Busayra Archaeological Survey*, 3, 4, 6.

The five zones of TBAS were further subdivided into random squares chosen from Geographic Information System (GIS) information. These squares were 500m² and were divided into 2 transects with 4 or 5 people per square. In these transects team members walked along straight lines in the squares 25-50 meters apart. In zone 4, Busayra, the squares were 200m² with only 1 transect per square. In zone 1, 6 of the 11 squares were covered, equaling 5.73% of this square, zone 2 had all 70 squares transected covering 4.78% of the area, in zone 3 all 6 squares were covered equaling 4.23% of that zone. In Busayra and its hinterland, 29 of 33 squares were covered at 4.69% of the area.¹⁸⁷ Using random squares was unique to TBAS.

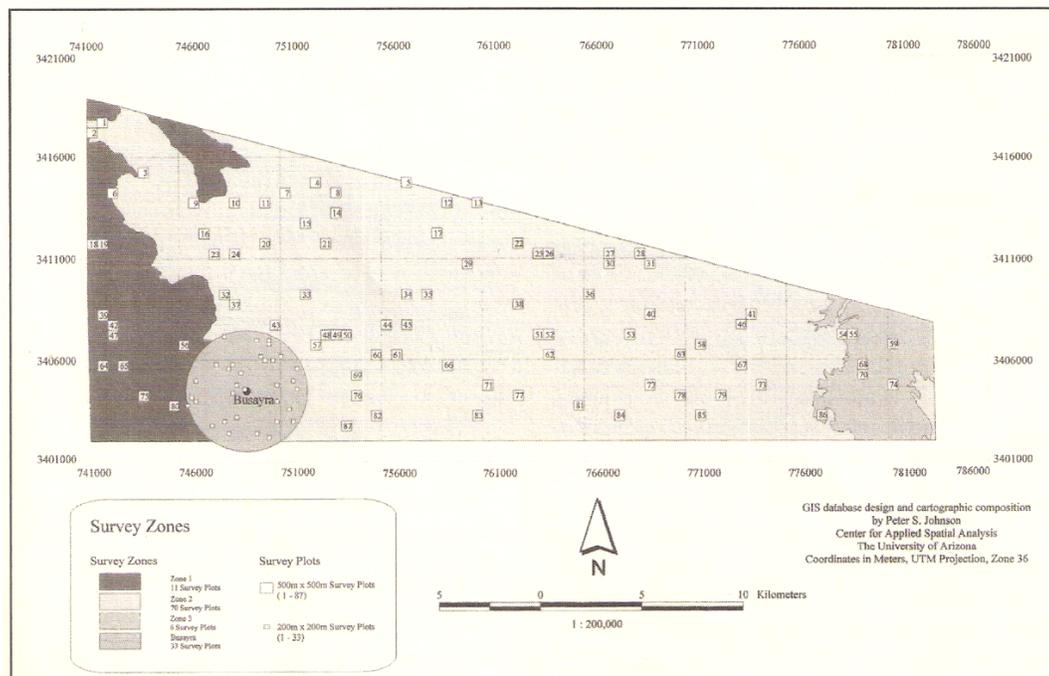


Figure 16: TBAS Random Squares

¹⁸⁷ MacDonald, *Talfila-Busayra Archaeological Survey*, 6, 47-8, 52.

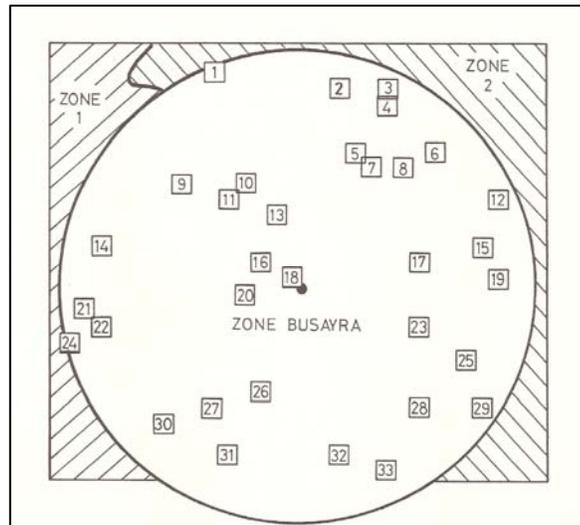


Figure17: Busayra Random Squares

Artifacts collection was different in TBAS compared to the earlier surveys. As team members walked transects in squares they collected artifacts and recorded sites. After sites were recorded then teams collected surface finds separately within those sites in addition to those within the random squares. Therefore the Tafil-Busayra survey has two separate records, with finds from squares recorded separately from finds from sites within the squares. Sometimes team members noticed sites just outside of their squares while walking their transects. For example, in the six squares in zone 1, 11 sites were recorded. Additionally, on the road between TBAS and SGNAS outside of the survey parameters, team members found 8 sites. In zone 2, 65 sites were found in the 70 random squares, and five sites were in the six squares of zone 3. Finally, the Busayra zone, with 29 squares, yielded 14 sites.¹⁸⁸

¹⁸⁸ MacDonald, *Tafila-Busayra Archaeological Survey*, 47-53.

TBAS teams also used what they called “ground-proofing”, meaning they used aerial photos to identify potential sites and then drove directly to those sites, or as close as possible before going to investigate on foot. If in fact verified as sites, then these were surveyed like other sites. And they also used “purposive surveying” including investigating sites found near the squares and talking with Jordanian locals, especially Bedouin, to discover sites. These sites were transected like all other sites in the survey.¹⁸⁹

For this survey, unlike WHS or SGNAS, MacDonald calculated trend surfaces of the area. Trend surfaces use polynomial equations to project the presence or absence of data in areas which were not surveyed. He warned however, that these may not reflect definite facts because it relied only on what was found, not those areas which were inaccessible. The variables included local polynomials, or many equations per space, and global polynomial, or one equation for the entire surface. Other variables were site locations vs. pottery finds per square, and two different powers of calculations which allow more or less definition within the area. For instance, at power 1 with global interpolation using site locations, the map has little definition and was far less accurate. MacDonald stated that the global and local polynomial at the power of 4 for both site and pottery distribution were the most accurate. When looking at these maps side by side, however, it is evident that random square counts do not necessarily signify the density of sites. MacDonald also noted that the inaccessibility of some areas created

¹⁸⁹ MacDonald, *Tafila-Busayra Archaeological Survey*, 6.

false holes in the surface trend, particularly in the western and northwestern areas of the region.¹⁹⁰

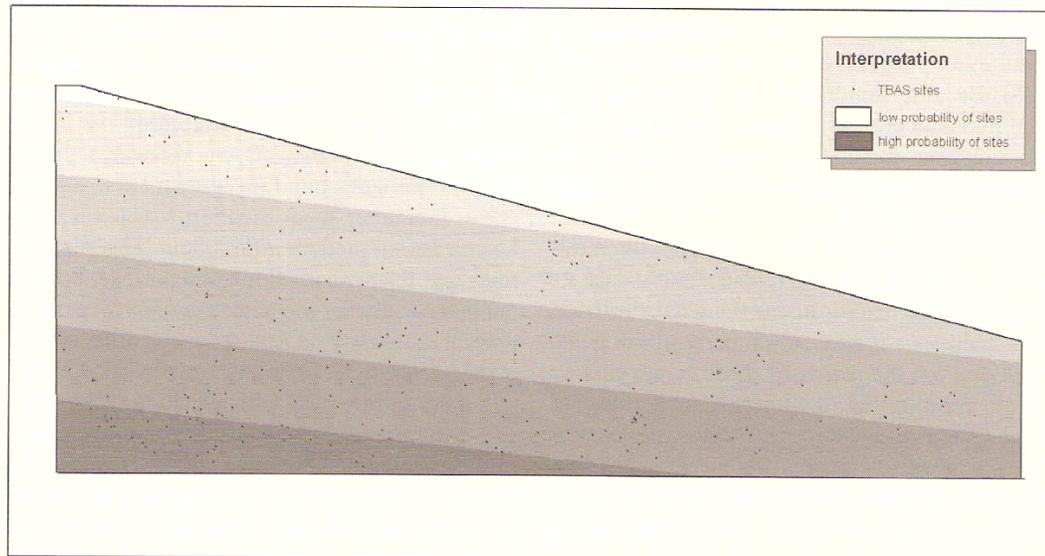


Figure 18: Site Global Interpolation, Power 1

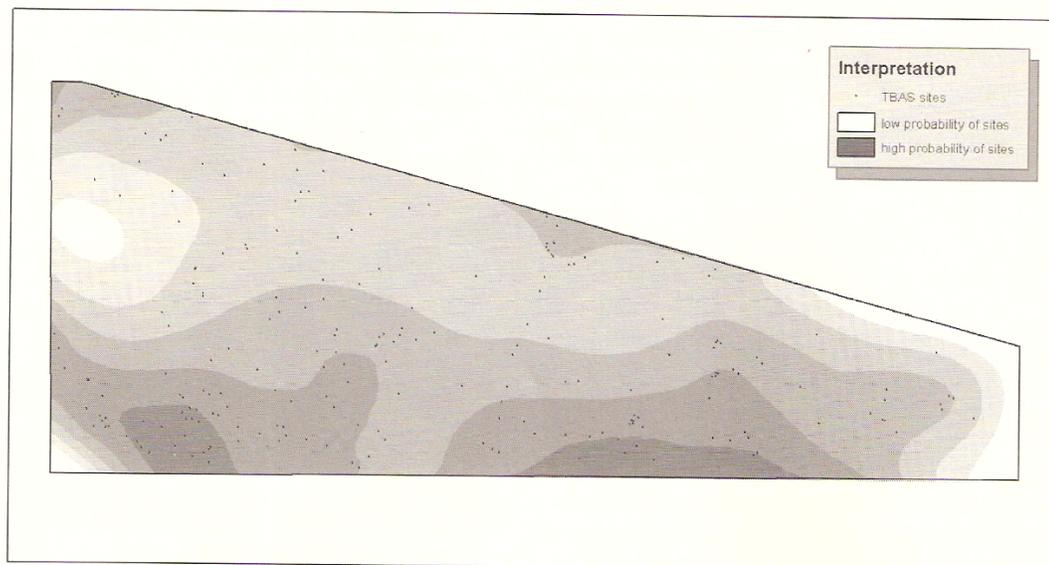


Figure 19: Site Local Interpolation, Power 4

¹⁹⁰ MacDonald, Marcy Rockman, "Trend Surfaces: From Site Location and Random-Square, Pottery-Count Data," in *Tafila-Busayra Archaeological Survey*, 67-73.

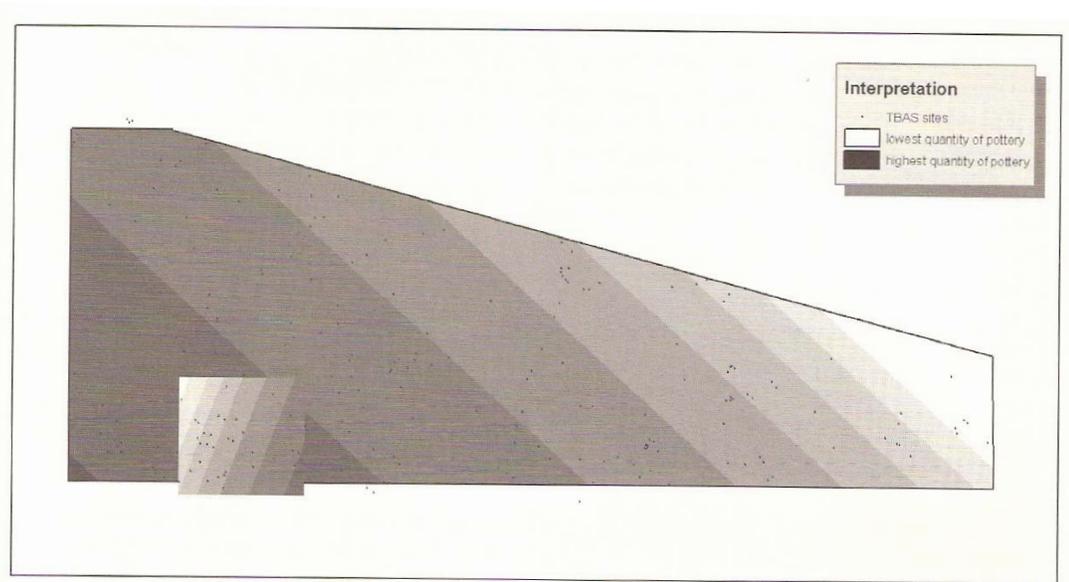


Figure 20: Random Square Pottery Global Interpolation, Power 1

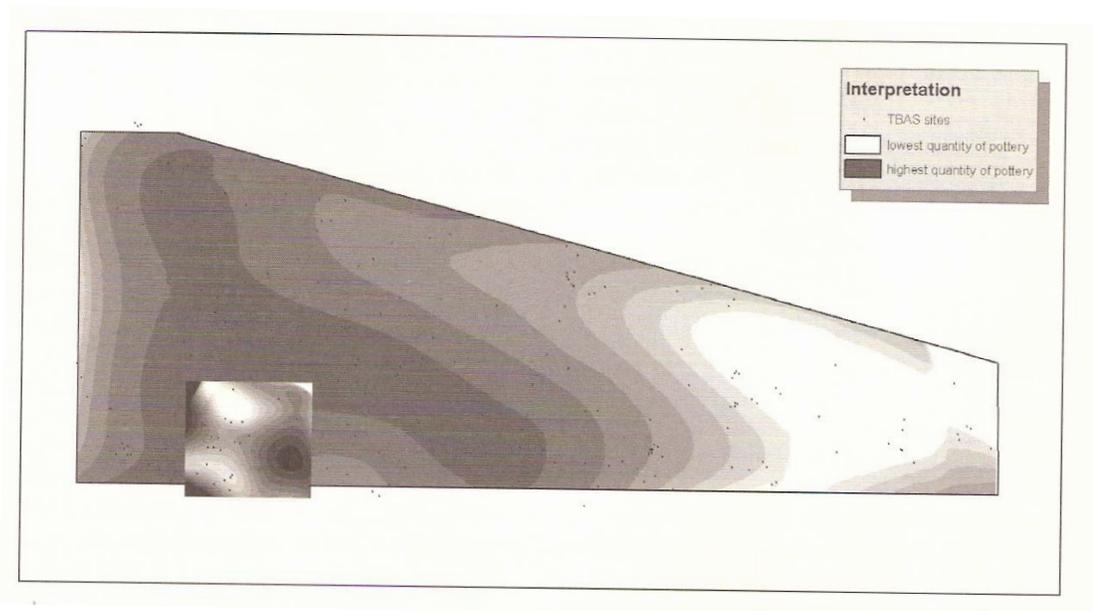


Figure 21: Random Square Pottery Local Interpolation, Power 4

II. EVIDENCE

MacDonald published the evidence for TBAS differently from both WHS and SGNAS. In WHS and SGNAS, MacDonald recorded the number of sherds per site. He divided up the sites by eras using these numbers. In TBAS, he gave only the total number of sherds recorded, 15,634 in all from the two survey seasons, and of these 5,563 from random squares.¹⁹¹ He also provided exhaustive descriptions of each square and site within the survey. However, in these descriptions he did not report the number of sherds per site, or square, or how many sherds were collected per era from a site. For the most part, he did not say which era appeared to be dominant in those sites and squares and did not establish an original settlement period. Without statistical sherd evidence or excavations it would be impossible to establish these periods. Therefore the method of analysis from both WHS and SGNAS is not applicable for TBAS.

In WHS and SGNAS, MacDonald also presented maps with site numbers for each era. MacDonald had two maps in the introduction of TBAS, one indicating square numbers and one with site numbers; however the square or site maps for each era had only dots, without site and square numbers. Thus connecting a specific site place on one map with a site number on another was difficult. Due to these inconsistencies this report will make the assumption that if TBAS reported the presence of pottery for an era then it will be treated as if there were more than five sherds for that era, as was done in both WHS and SGNAS. One must proceed with caution when drawing conclusions from all sites in TBAS because of the inconsistencies and incomplete reports.

¹⁹¹ MacDonald, *Tafila-Busayra Archaeological Survey*, 47.

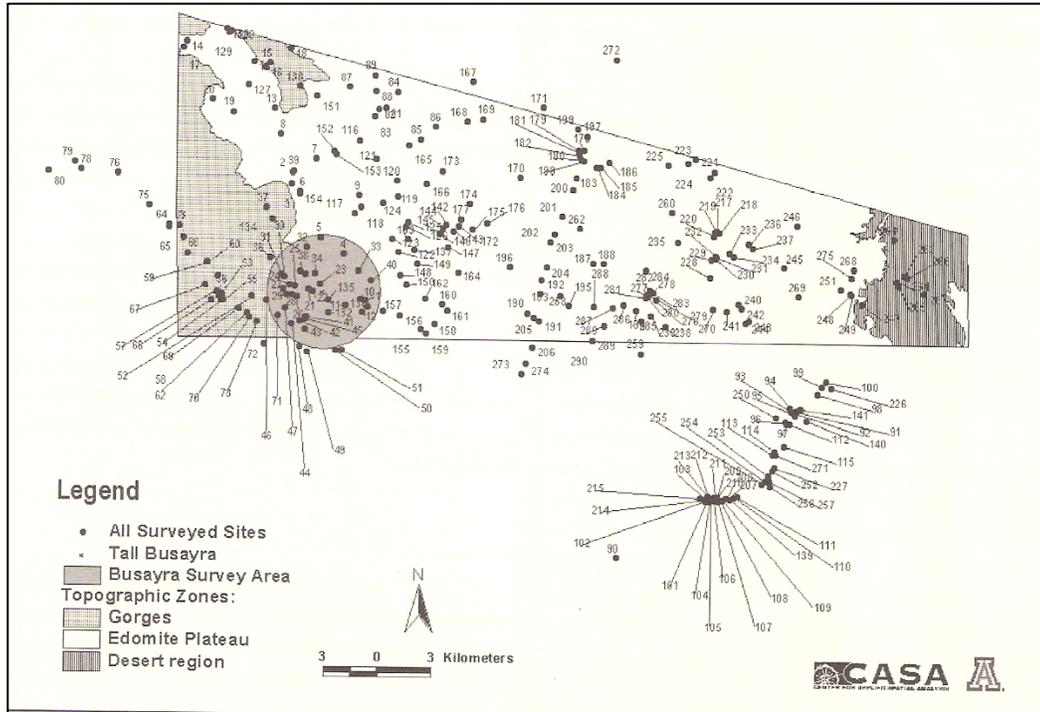


Figure 22: TBAS Sites

In this survey, MacDonal divided sites by functions within all chronological periods, prehistoric through Islamic. In other words, he did not divide functions by historic era, again leaving questions about original builders, reuse, etc. There were 22 functions listed: 66 seasonal camps and enclosures used by Bedouin or travelers, 54 farms and villages, six terraces, six water catchment facilities and 28 seasonal camp/production/ processing centers- the later mostly near the Pleistocene lakes. There were also 20 watchtowers, eight forts, 19 tombs or cemeteries, nine caves, nine milestones, two citadels, one castle, five churches, five quarries, three inscriptions, (one associated with a church, one with a milestone and one with a town). There were three

caravanserai associated with travel and trade and three highways. Specific uses for the rest of the categories were vague; including 13 structures, eleven lithic scatters, eight lithic/sherd scatters and wall lines.¹⁹²

TBAS recorded 290 sites and 119 random squares in three seasons. The Early Bronze Age sites were sparse, 1.72% or 5 sites, mainly seasonal camps and small settlements in the Busayra Citadel- the capital of Edom. This site, Busayra, was occupied during all eras of this study beginning with the Early Bronze Age. This evidence suggests that this area was settled before the Edomites made it their capital. But, Glueck believed that it was founded in the early Iron Age and was a one of the strongest Edomites cities, which stood guard over the roads from the copper mines in Wadi Arabah.¹⁹³ The Iron Age was a time of intensification in TBAS. The establishment of the Edomite kingdom and the capital in Busayra initiated settlement throughout the area, leaving many architectural and agricultural sites from this period. A total of 28.62%, or 84, sites were recorded for the Iron Age. Abatement of settlement followed in the area during the Hellenistic era with 2.41%, or 7 sites. A site in Busayra remained occupied as did a few to the north, including villages with agricultural land. The Roman period sites increased dramatically compared to the Hellenistic era, filling in mainly the western regions with 31.03%, or 90 sites. But the Byzantine had the largest number of sites, 46.6% or 135 sites, and more sites in the eastern portion of the survey area. It is particularly interesting that there were many Byzantine sites near the

¹⁹² MacDonald, *Tafila-Busayra Archaeological Survey*, 15-16.

¹⁹³ Glueck, *Explorations in Eastern Palestine II*, 97-98.

via nova Traiana and the eastern desert road whereas WHS, just to the north, saw an abatement in the east at the same time.

Site discussion

The Roman period (including evidence called Early Roman, Nabataean, Roman and Late Roman), ca. 63 BC – AD 324, showed a dramatic increase in sites from the Hellenistic era and a slight increase from the Iron Age. In all there were 90 sites with Roman evidence. Of the 16 Early Roman sites, seven were also occupied during Late Roman period.¹⁹⁴ Of the other nine, sites 28, 50 and 71 were classified as farm/villages and were within Zone Busayra, site 140 is in the Pleistocene lake zone, 170 was also a farm or village, Khirbet Abur, near the Trajanic highway, 171 was a stone wall and 175 was a sherd scatter and cistern.¹⁹⁵ These last three were in the north central plateau. Site 195 was a production center with surrounding agricultural fields and 273 appears to have been a major site with many structures, caves and cisterns. MacDonald described it as a citadel near the *via nova Traiana*. These sites were both in the south central plateau.¹⁹⁶

After the beginning of the Early Roman/Nabataean era, settlements increased throughout the period. These settlements, or sites with sherd evidence, filled in around the areas where the Early Roman and Hellenistic sites were located. 41 Iron Age and four Hellenistic sites were repopulated in the Roman era. Half of the Roman sites were

¹⁹⁴ MacDonald, *Tafila-Busayra Archaeological Survey*, 60.

¹⁹⁵ Glueck, *Explorations in Eastern Palestine III*, 49-50.

¹⁹⁶ MacDonald, "Introduction", 15; MacDonald, Herr, Neeley, "Site Descriptions" in *Tafila-Busayra Archaeological Survey*, 356, 404.

settled in earlier periods and half were new settlements. The Roman period sites filled in areas of Zone 1 along the route to Wadi Arabah as well as the western and central portions of Zone 2. Only a few sites at the desert fringes and the desert zone were also occupied and along the *via nova Traiana* toward the Pleistocene lakes.¹⁹⁷ This follows the pattern in the WHS region in which Roman settlements developed mainly in the central survey region. However, in the WHS region, settlements also grew along the desert fringes. Altogether, Early Roman, Nabataean, Roman and Late Roman sites were 31.03% of the total sites and in 51.26% of all random squares.

Byzantine evidence was by far the most prevalent in TBAS as in WHS and SGNAS. The gorges of zone 1 had six random squares each with Byzantine evidence and zone 2, with 70 random squares, had 51 squares with Byzantine sherds. Of the seven squares in zone 3, the desert fringes, two had Byzantine sherds. These two plus another on the eastern edge of zone 2 were located near the Desert Highway. Of Busayra's 29 squares, 20 yielded Byzantine pottery. 68.8% of the total squares yielded Byzantine evidence. All zones showed an increase in Byzantine evidence; however zone 2 showed the most growth.¹⁹⁸ It is interesting that this growth shifted toward the desert fringes during this time, unlike WHS where settlement shifted to the west away from the desert. Most squares in the eastern plateau, zone 2, without Byzantine evidence only had Paleolithic and Neolithic evidence. Of the 70 squares of zone 2, only three had Roman and three had Islamic sherds and one had Iron. Therefore, the

¹⁹⁷ MacDonald, *Tafila-Busayra Archaeological Survey*, 57-60.

¹⁹⁸ *Ibid.*, 61-2.

Byzantines reoccupied many sites, moved further east and occupied more eastern sites than in any other period.

Byzantine evidence was recovered at 135 sites or 46.6% of all sites. This included 61% of all sites identified as farms, 77% of sites with structures, all sites with churches or caravanserais, 70% of all sites with watchtowers and 63% of all random sherd scatters, plus one castle. This thereby implies an increase in settlements, farming and perhaps more trade through the region.¹⁹⁹

The large number of Byzantine settlements prohibits discussion of them all here. Therefore, I will discuss those sites with exclusively Byzantine evidence, those MacDonald interpreted as primarily Byzantine and those settled infrequently before or after the Byzantine period. The discussion is complicated by several problems. MacDonald's descriptions are often too vague for precise interpretation. Further, his criteria for interpreting sites as predominantly Byzantine are unknown. But for purposes of this study I have chosen to rely on these judgments.

In Zone 1, the gorges, most Byzantine sites were along the route to Wadi al-Dahal. These were a farm or village, at site 37, a tomb at site 58 and a church at site 59. These 3 sites were occupied during the Iron Age except 58, which was only Byzantine. Site 69, near the south east end of the route, included a structure with only Byzantine sherds with ancient terracing nearby. Outside the TBAS area but along this route were three predominantly Byzantine sites. Site 64 was a cave probably used as a cistern. It was near site 65 which was a structure. Its location suggests a possible watchtower.

¹⁹⁹ MacDonald, *Tafila-Busayra Archaeological Survey*, 15-16.

Site 80, at the farthest point west of the surveyed area, was interpreted as a seasonal camp. From here, the team saw other similar sites which were not surveyed. There were twelve other sites with Byzantine evidence, as well as that of other eras, along this route. This route between the SGNAS and TBAS areas reflected intensive use in several periods but especially during the Byzantine era. One random square in Zone 1 mirrored these findings; moreover all other random squares in Zone 1 yielded no evidence at all suggesting that the most intensive occupation along this route was during the Byzantine era.²⁰⁰

In Zone Busayra, MacDonald labeled one site as predominantly Byzantine and another with only Byzantine evidence. However, there were 13 other sites within the Busayra zone where the final period with dated artifacts was Byzantine or also had Middle and/or Late Islamic evidence, ca.1000-1918. Tall Busayra itself had evidence of habitation from Iron II through Byzantine eras, except for Hellenistic, with reoccupation in the Late Islamic, 1400-1918. Four sites with Byzantine artifacts (sites 1, 4, 51) had mills or olive presses, and one site with similar installations, site 45, yielded no ceramics. Aside from Busayra, there were three other villages; site 48, just south of the 3 km circle drawn around Busayra, was a major village with exclusively Byzantine artifacts. This site formed the end point in the alignment of sites toward Wadi al-Dahal. Site 51, a village just east of site 48, had one of the previously mentioned mills. A possible fort, site 26, lies near the heart of Zone Busayra. Of the remaining sites, 005 was a possible church and five were associated with terracing or

²⁰⁰ MacDonald, Herr, Neeley, *Tafila-Busayra Archaeological Survey*, 188, 210, 220, 216, 217, 228, 76-80.

agricultural fields. These sites 08, 24, 28, 33, and 39 were scattered mainly in the western portion of Zone Busayra.²⁰¹

Fifteen sites in Zone 2 had predominately or only Byzantine evidence. Of these, six were designated as farms or villages. These include site 86 on the northern TBAS border of the survey area and site 159, with a grinding stone, directly south at the opposite border. In between were farm/village sites 165 and 166. Just east of 86 was another agricultural site, 168, with predominantly Byzantine sherds. West of site 166 was another predominantly Byzantine structure and cleared field, site 120. In a line with these predominately Byzantine sites were four other Byzantine sites; these included two villages with significant structural remains, site 126, Jabal Ras al-Hala, and nearby Khirbat Masala, site 147. The area around these two sites is used for agriculture in modern times and was likely also in earlier periods. The other two Byzantine agricultural sites were sites 144 and 146. Byzantine presence was found at many sites west of this line in Zone 2.²⁰²

In the northwestern area of Zone 2, the Citadel of al-Tafila, site 151, yielded artifacts of every historic period except Hellenistic. Byzantine sherds, however, were dominant. The citadel was a large structure on several levels with a central hall connecting many rooms. MacDonald suggested that the surviving windows within the structure could have functioned defensively or offensively. A millstone was also found

²⁰¹ MacDonald, Herr, Neeley, "Site Descriptions," 151-2, 156, 206, 196, 200, 179, 158, 163, 178, 182, 185, 190; MacDonald, *Tafila-Busayra Archaeological Survey*, 61-2, 15-16.

²⁰² MacDonald, Herr, Neeley, "Site Descriptions," 231, 308, 316-18, 321, 260, 266, 294, 289, 291; MacDonald, *Tafila-Busayra Archaeological Survey*, 61-2, 15-16.

at this site.²⁰³ Glueck reported that an east-west caravan route had led from al-Tafila, crossed the Negev, and ended at Gaza. This was not a Roman road according to *The Barrington Atlas of the Greek and Roman World*.²⁰⁴ The land around Tafila is fertile with many springs. As early as Glueck's day, many ancient sites had already been destroyed by cultivation. He assumed that the springs and good agricultural land encouraged settlement as early as the Edomite era.²⁰⁵ South of al-Tafila were Byzantine sites, 39, 7, and 154, all associated with farming during the Byzantine Era. To the east, however, the Byzantine sites appeared to have different functions.

Of these 15 predominantly Byzantine sites, four were associated with the *via nova Traiana*. Two of these, 184 and 185 were seasonal camps, while 258 was a watch tower and 190 was a possible defensive structure. There were 14 other Byzantine sites along the *via nova Traiana* in the TBAS area. Site 192, Kh. at-Tuwanah, was a settlement with structures, many cisterns, and a possible watch tower. Glueck noted that the land between Tafila and Tuwanah was fertile and cultivable and interpreted Tuwanah as mainly a Nabataean-Roman resettlement at the crossroads of the *via nova Traiana* and an east-west road leading to Busayra, continually inhabited through the Byzantine and Islamic eras.²⁰⁶ Other Byzantine sites along the *via nova Traiana* had possible watchtowers, seasonal camps and some agricultural fields. This intensive Byzantine use of the *via nova Traiana* was in stark contrast to the supposed lack of

²⁰³ MacDonald, Herr, Neeley, "Site Descriptions," *Tafila-Busayra Archaeological Survey*, 300.

²⁰⁴ S. Thomas Parker, "Figure 71-Petra; Part 5: Syria-Meroe," in *The Barrington Atlas of the Greek and Roman World*, Richard J. A. Talbert, ed. (Princeton: Princeton University Press, 2000).

²⁰⁵ Glueck, *Explorations in Eastern Palestine II*, 16, 99-100.

²⁰⁶ Glueck, *Explorations in Eastern Palestine III*, 49, 53.

evidence for Byzantine use of this road just to the north in the WHS area. In fact, it appeared there was more evidence of Byzantine than Roman use of the *via nova Traiana* in TBAS. Also surprising was the Byzantine presence east of the *via nova Traiana* in the TBAS region.²⁰⁷

Near the Desert Highway at the eastern edge of Zone 2 were two Byzantine watchtowers (sites 251 and 268), one yielded only Byzantine sherds. These sites were close to the desert Zone 3. Two Byzantine sites (261 and 263) inside Zone 3 were seasonal camps. The TBAS evidence suggests that this route was exploited more intensively in the Byzantine period except the Early Bronze Age. This route continued south of the survey region into Zone 5 and suggests Byzantine presence in the southernmost portion of this zone towards Aqaba. The area between the Desert Highway and the *via nova Traiana* was also dominated by predominantly Byzantine sites.²⁰⁸

The center of the region between the *via nova Traiana* and the Desert Highway was well represented by Byzantine sites. Sites 260 in the north and 238 and 259 in the south were probably watchtowers. Site 260, Rujm al-Hamra, was predominantly Byzantine. But Glueck believed that this fortress was part of the Edomite border defense because of its round shape. MacDonald found evidence of Byzantine reoccupation. Glueck also reported the Roman road, *via nova Traiana*, nearby. Because this fortress not on fertile land, Glueck argued that its primary purpose was to

²⁰⁷ MacDonald, Herr, Neeley, "Site Descriptions," 342, 391, 345, 348; MacDonald, *Tafila-Busayra Archaeological Survey*, 61-2, 15-16.

²⁰⁸ *Ibid.*, 386, 398, 395, 396, 61-1, 15-16.

protect the *via nova Traiana* and the fertile land west of the site.²⁰⁹ Sites 278, 242 and 233 were seasonal camps. Of these, 278 was mainly Byzantine and near to a road that connected at-Tafila and Jurf ad-Darawish. Looking at the distribution of Byzantine sites, it could be that many were associated with this road as well as other north-south routes. In short, this all suggests intensive Byzantine use of lands near the ancient roads and caravan routes, especially for agriculture.

In all the zones Byzantine presence was found at slightly more than 50% of all sites. In the random squares, Byzantine evidence was found at 100% of Zone 1, 72.86 % of Zone 2, 33.33% of Zone 3, and 68.99% of Zone Busayra. The random square map reveals Byzantine squares throughout the survey region. The primary absence of squares for this period is between the *via nova Traiana* and the Desert Highway. However, all but four of the squares in this area which did not have Byzantine sherds had only lithic era evidence (i.e. prehistoric) evidence. Therefore the Byzantine era witnessed more intensive occupation of this region than any other historic period.²¹⁰

²⁰⁹ Glueck, *Explorations in Eastern Palestine III*, 24, 51-52.

²¹⁰ MacDonald, *Tafila-Busayra Archaeological Survey*, 61-2.

Table 7: TBAS Sites by Period

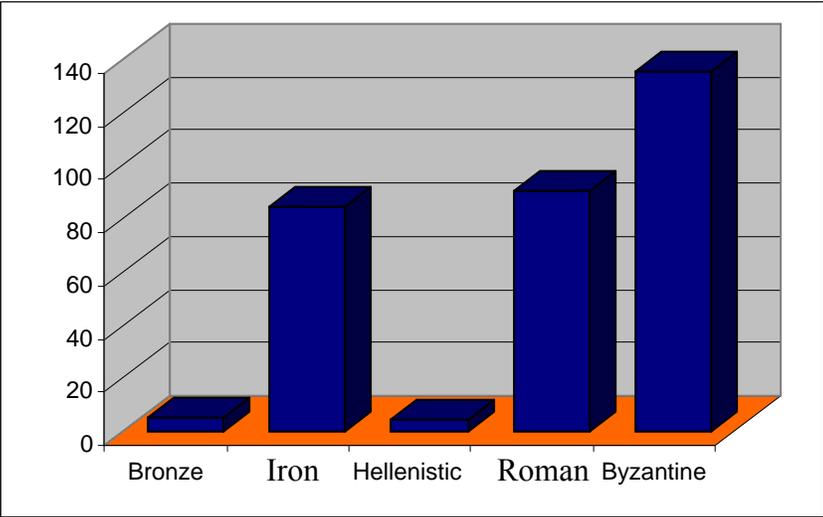
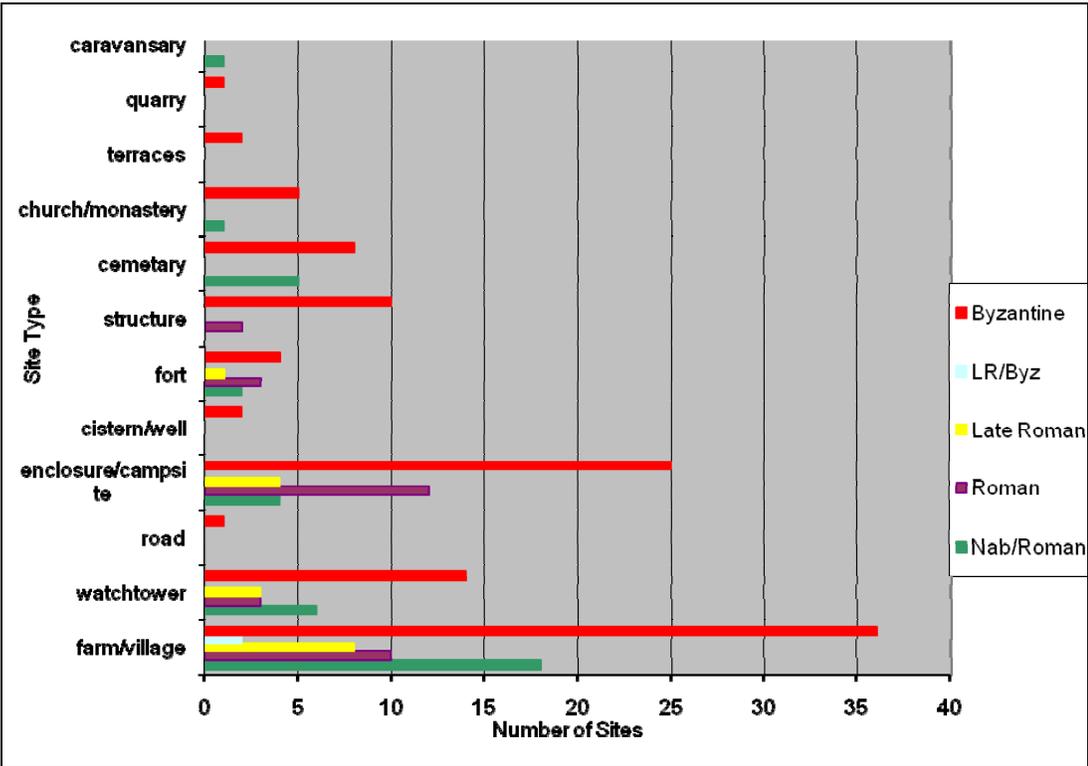


Table 8: TBAS Site Types



CHAPTER 3

The three surveys were meant to serve as catalysts for further research in the area south and southwest of Wadi el Hasā. In the TBAS conclusions, MacDonald stated “Now it is time for further investigation of the area by means of archaeological excavations.”²¹¹ Surface surveys, as MacDonald knew, assist in creating database that researchers use for future work. These surveys are part of that database: however the information from each survey is difficult to synthesize because each survey was reported in disparate ways. For example, essential pottery evaluations were not given for every survey, only that of the WHS. This chapter will look at pottery from WHS to evaluate settlement periods. Then mill sites from each will be evaluated to better resolve settlement information during the Byzantine era. Because the Negev and Petra were interconnected socially, economically and politically, evidence from these areas will be discussed. The Negev and Petra have witnessed more excavations than the central Jordan region. Byzantine papyri were found in both the Negev and Petra and provide economic and agricultural information. This chapter will also discuss some excavations and survey works in the area before, during and since MacDonald’s surveys were completed. Some of this work is still ongoing or yet to be published. Review of the scope of current work points towards those areas needing further study. Finally, information from sites, charts and settlement trends from all three surveys along with the evidence from papyri, and other excavations will be discussed to evaluate regional

²¹¹ MacDonald, “Summary and Conclusions,” *Tafila-Busayra Archaeological Survey*, 419.

settlement patterns and land use during the Byzantine period. As a postscript, I will conclude by identifying several *lacunae* in the archaeological evidence and assessing potential excavation opportunities.

A. FURTHER RESEARCH

I. Pottery

Pottery can be evidence of many different phenomena, including cultural influence, economic relationships, and the presence of settled populations in some places in different eras.²¹² One important way to date ancient settlements is by the pottery from those sites. This evidence is also used by archaeologists to date settlement phases. Pottery published by A.D. Tushingham and J.W. Hayes was cited by MacDonald as parallels for dating his own ceramic material. Tushingham excavated Dibon, a site north of Wadi el Hasā, in 1952 and 1953. In 1972 Tushingham developed a ceramic chronology, mostly of local coarse wares, based on stratified sequences recovered from his excavations. His publication included drawings, descriptions and dates of the pottery. Tushingham however acknowledged the difficulty of closely dating much of his pottery, particularly Byzantine pottery, because of the scarcity of comparable *comparanda* from the region up to that time.²¹³ Hayes, on the other hand, produced a ceramic chronology of Late Roman and Byzantine fine wares from the entire Mediterranean by comparing stratified ceramic sequences from several key sites,

²¹² Butcher, *Roman Syria*, 30, 42, 56.

²¹³ A.D. Tushingham, *The Excavations at Dibon (Dhībān) in Moab* (Cambridge: American Schools of Oriental Research, 1972), 1-3.

such as Athens, Antioch, Dura-Europos and Carthage and in museums including London, Paris and Mainz. He then created types according to this dating system.²¹⁴ His 1972 publication, *Late Roman Pottery*, was the first resource of its kind for pottery from the 2nd through the 7th centuries AD. Hayes's many years of experience and study in the Mediterranean assisted his efforts. His work has become the definitive resource for Late Roman and Byzantine fine wares of this period. However, this resource is restricted to fine ware, not coarse wares of the same periods.²¹⁵

In the Wadi el Hasā survey, MacDonald referenced these two publications to aid with dating his ceramic evidence. However, for some reason in the Southern Ghors and Tafila/Busayra surveys he did not provide any references for pottery.²¹⁶ The publication in 1988 of the Wadi el Hasā survey, the first of the three projects to be published, occurred when less was known about Byzantine pottery and in any case little pottery was actually included in the publication. The lack of available *comparanda* for the coarse wares in this region in particular at the time may have limited MacDonald's ability to date WHS sherds. Secondly, MacDonald had the opportunity in the two later surveys to publish ceramic evidence when much more published pottery from the region was available, but for some reason he did not. For this reason, an argument supporting specific dates of sites, using accurately dated and referenced ceramic evidence, cannot

²¹⁴ J.W. Hayes, *Late Roman Pottery* (London: The British School at Rome, 1972), 1-2.

²¹⁵ *Ibid.*, 1-12.

²¹⁶ It should be noted, however, that both of these reports included many ceramic illustrations, *sans* reference or specific dates.

be made for either SGNAS or TBAS in this paper. Therefore only ceramic information of the Wadi el Hasā Survey will be discussed in this section.

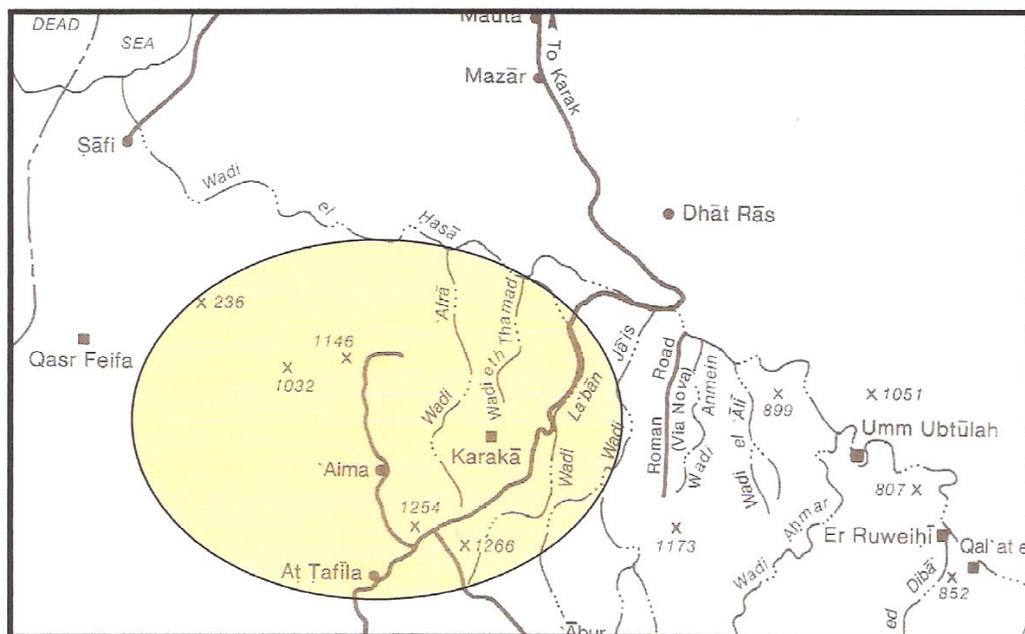


Figure 23: WHS Approximate Western Universe

WHS Pottery

The published pottery from the Wadi el Hasā survey was limited to 23 plates with referenced and illustrated pottery and only three of these contained Byzantine pottery. Neither descriptions nor references were included in all of these illustrations. MacDonald referred to the majority of the sherds in general, nonspecific terms in the body of his work, not the pottery plates. Although the survey recovered 9,152 pottery sherds throughout the WHS area, they only illustrated and referenced 389 sherds. Nine of those were Byzantine. These nine sherds came from only five sites (23, 172, 223, 1 and 6) in the western universe. This analysis will discuss only the pottery referenced in these plates.

Plate 19 included pottery from sites 23, 172 and 223, all of which MacDonald classified as Byzantine. Site 23, Mashmil, has ancient foundations, a tower, cisterns, and a nearby quarry. This was a village and/or fortress.²¹⁷ The parallel for sherd 1 (fig. 25a) from this site was cited in Tushingham as a Byzantine Phase B period (fig. 25b), or the late 6th and the early 7th centuries.²¹⁸ Sherd 3 (fig. 25a) was also paralleled in Tushingham, dated to the late 6th century (fig. 25b).²¹⁹ Parallels for two of the three sherds for site 172 were also cited. Sherd 4 (fig. 26a) was compared to Tushingham's late 6th century bowl (fig. 25b) as mentioned for sherd 3 above. Sherd 5 (fig. 26a) was also from the late 6th century and resembles several cooking pots in Tushingham's

²¹⁷ MacDonald, "The Byzantine Period," *Wadi el-Hasa Survey*, 241.

²¹⁸ *Ibid.*, 338-339; A.D. Tushingham, *The Excavations at Dibon (Dhībān) in Moab* (Cambridge: American Schools of Oriental Research, 1972), 137, Fig. 5:35.

²¹⁹ MacDonald, *Wadi el-Hasa Survey*, 338-339; Tushingham, *The Excavations at Dibon*, 149, Fig. 12:10.

figure 9 (fig. 26b).²²⁰ This site in the western universe was probably a village.

MacDonald also offered a parallel for one sherd from site 223. Sherd 9 (fig. 27a) was a rim similar to a basin Tushingham dated to the third quarter of the 6th century (fig. 27b).²²¹ This site was on a summit at the confluence of Wadi el Hasā and Wadi La bān and was similar to other structures at other confluences of Wadi el Hasā and its tributaries.²²²

MacDonald's plate 18 shows pottery from sites 1 and 6. Only sherds 5, 7, 10 and 13 were dated Byzantine with cited parallels. Both sherds 5, from site 1, and 7, from site 6 (fig. 28a), were compared to Hayes as *Late Roman C* ware, figures 67-69: sherds 1-40 (fig. 28b), dated between the second half of the 5th through the first half of the 6th century.²²³ Site 1 was a large architectural site with towers, buttresses, courtyards, streets and two gates. Site 6, near site 1, was a large site with well preserved walls, caves and tombs. Both of these sites were associated with farms and fortresses.²²⁴ Sherd 10 from site 6 (fig. 29a) was compared to Tushingham's sherds in figures 5 and 10 (fig. 29b). Sherd 27 in figure 5 was from the 6th century and sherds 33-39 of figure 10 were from the third quarter of the 6th century.²²⁵ The final sherd of plate 18 was sherd 13 from site 6 (fig. 30a), which was compared to Tushingham's

²²⁰ MacDonald, *Wadi el-Hasa Survey*, 338-339; Tushingham, *The Excavations at Dibon*, 155, Fig. 12:10; 147, Fig. 9:8-11, 15.

²²¹ MacDonald, *Wadi el-Hasa Survey*, 338-339; Tushingham, *The Excavations at Dibon*, 151, Fig. 10:53.

²²² MacDonald, "The Byzantine Period," *Wadi el-Hasa Survey*, 245.

²²³ MacDonald, *Wadi el-Hasa Survey*, 336-337; Hayes, *Late Roman Pottery*, 330-334, 338.

²²⁴ MacDonald, *Wadi el-Hasa Survey*, 238-240.

²²⁵ Tushingham, *The Excavations at Dibon*, 137, Fig. 5:27, 150, Fig. 10: 33-39.

sherds 16 and 43 of figure 12 (fig. 30b). He dated these sherds to the third quarter of the 6th century.²²⁶ Both sherds 10 and 13 were from site 6.

The Byzantine sites MacDonald included in this section were villages and/or fortifications, or were associated with such sites. They were part of the cluster of Byzantine sites in the western plateau region. This area was densely occupied during the Byzantine era and, according to the dated pottery sherds was occupied into the late 6th and possibly the early 7th century. None of these sites had evidence of Early Islamic occupation, (ca. 630-1174), and only sites 1 and 23 were occupied in the Late Islamic period, (ca. 1174-1918). With so few published sherds a definitive assessment of the entire region is not possible. But what can be said of these sites, if not the entire area, is that settlement continued here through the Late Byzantine period. Analysis of Byzantine pottery from other sites in the WHS area could yield further evidence of more widespread occupation.

²²⁶ Tushingham, *The Excavations at Dibon*, 155-6, Fig. 12:16, 43.

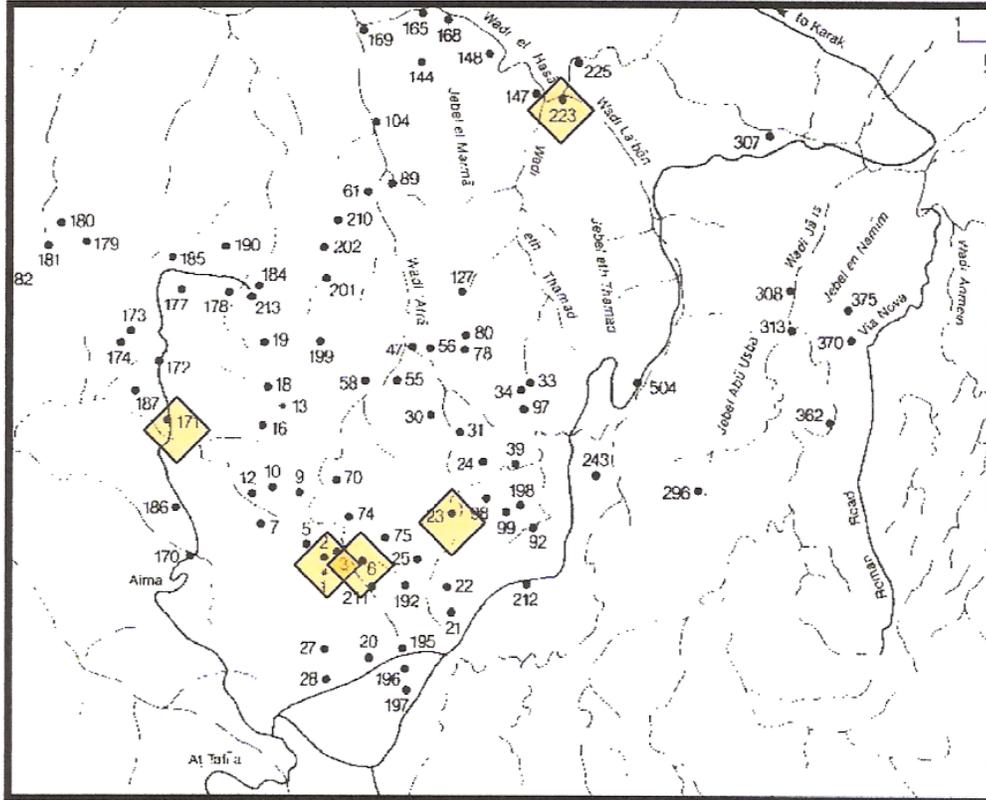


Figure 24: WHS Byzantine Sites with Published Pottery: Western Universe

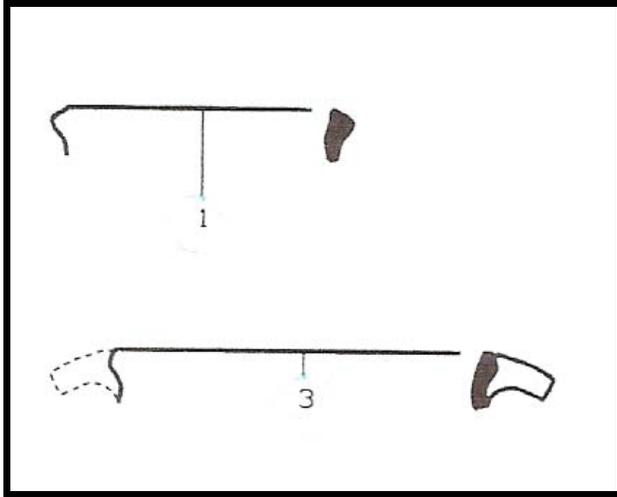


Figure 25a: WHS Site 23, sherds 1; 3

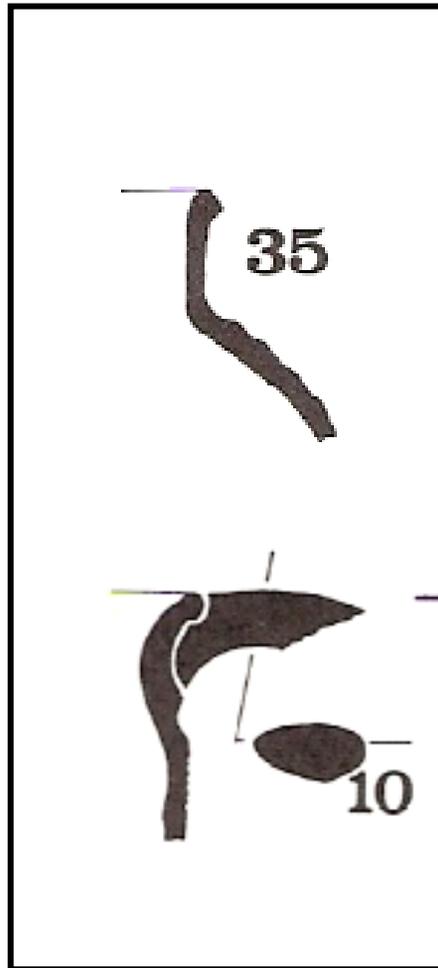


Figure 25b: Tushingam Figures 5:35; 12:10

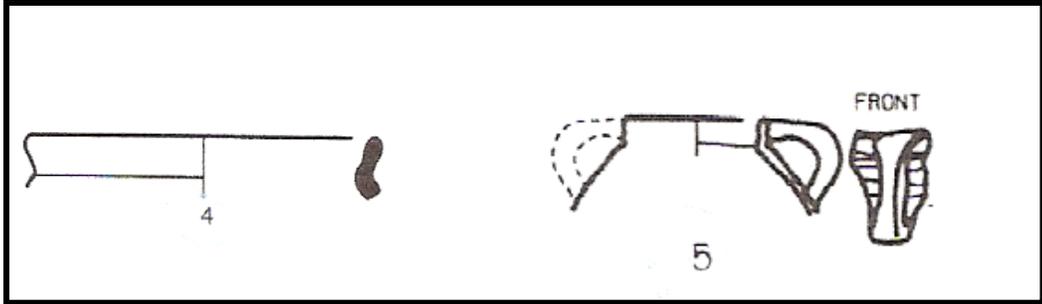


Figure 26a: WHS Site 172, sherds 4; 5

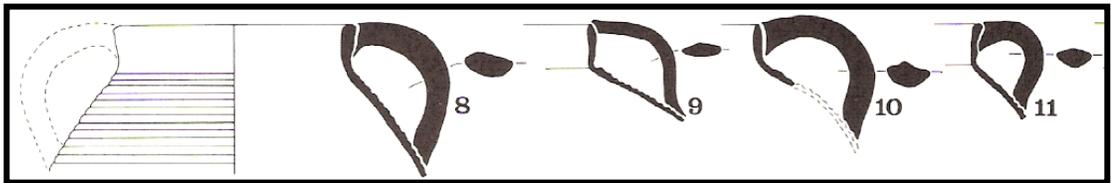


Figure 26b: Tushingam Figure 9: 8-11

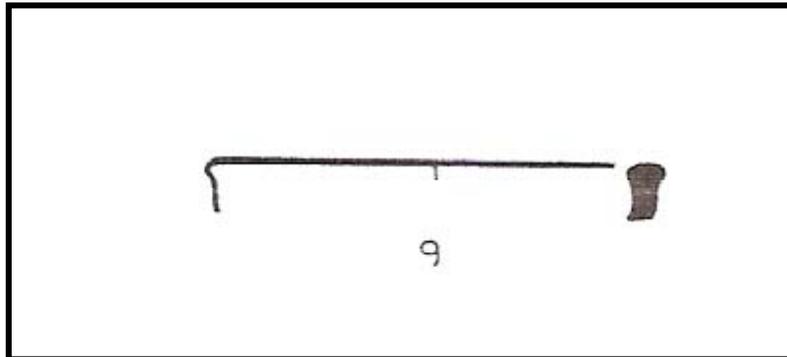


Figure 27a: WHS Site 223, sherd 9



Figure 27b: Tushingam Figure 10: 53

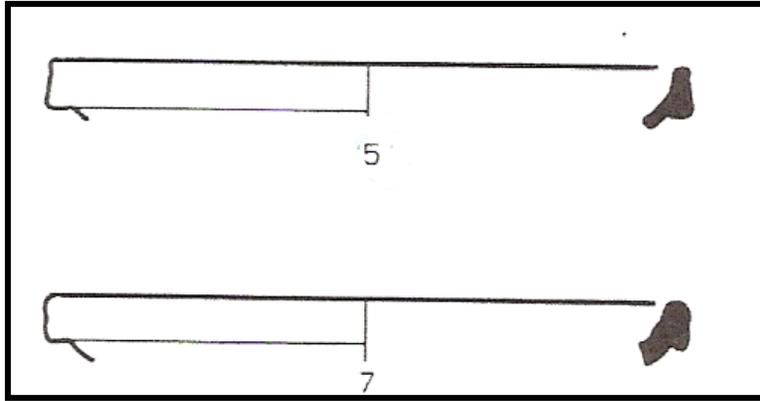


Figure 28a: WHS Site 1-sherd 5; Site 6-sherd 7

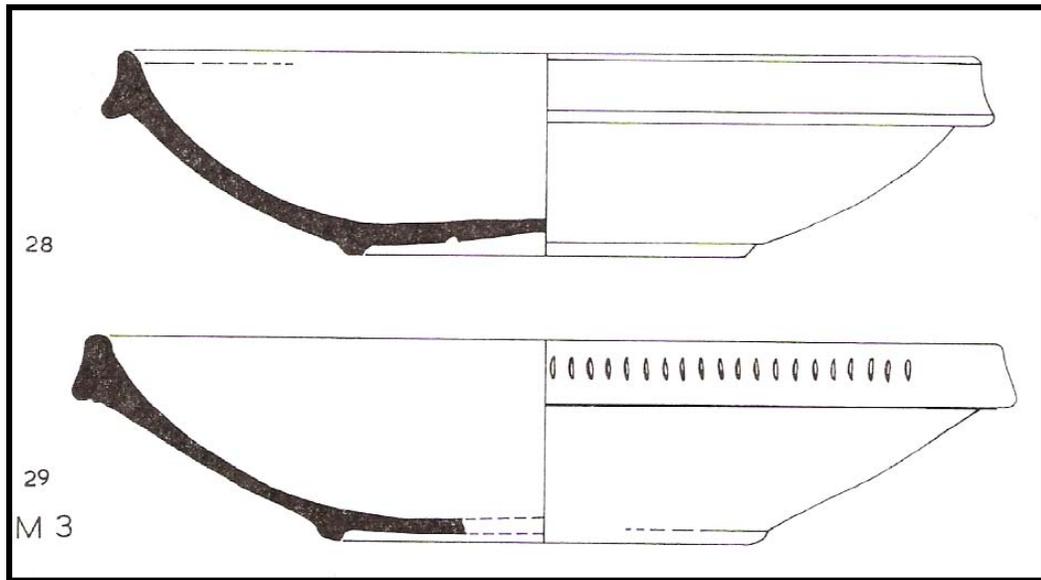


Figure 28b: Hayes Fig. 68: 28-29

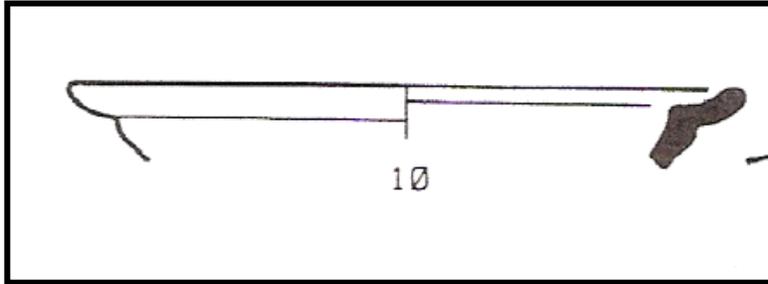


Figure 29a: WHS Site 6-sherd 10

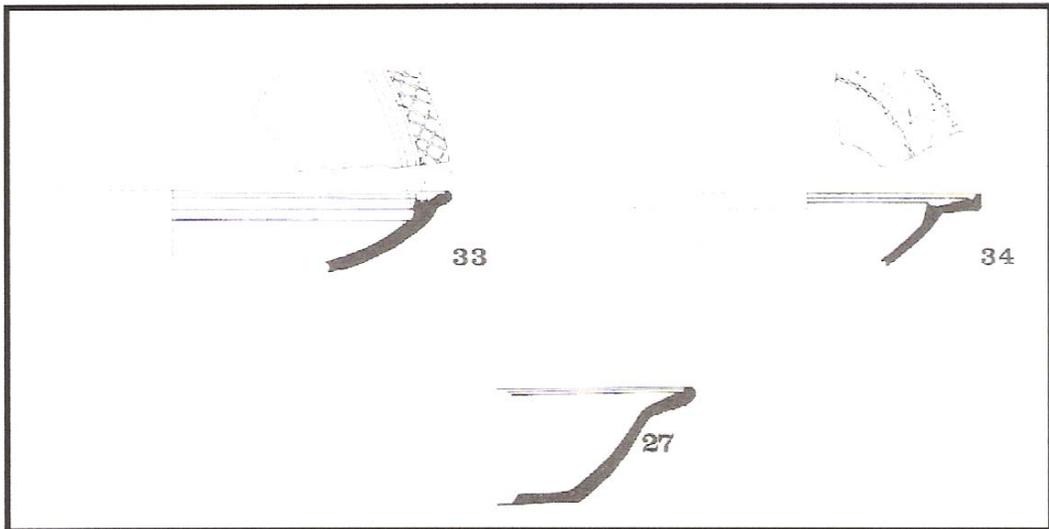


Figure 29b: Tushingam, Fig. 10:33-34, Fig. 5:27

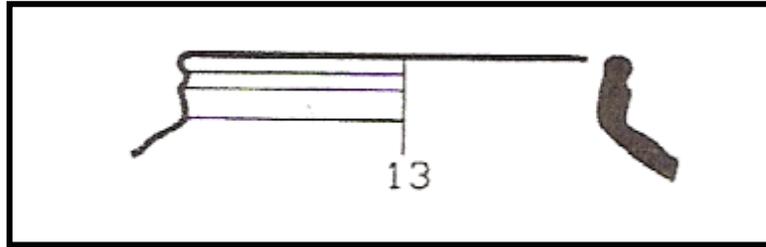


Figure 30a: WHS Site 6- sherd 13

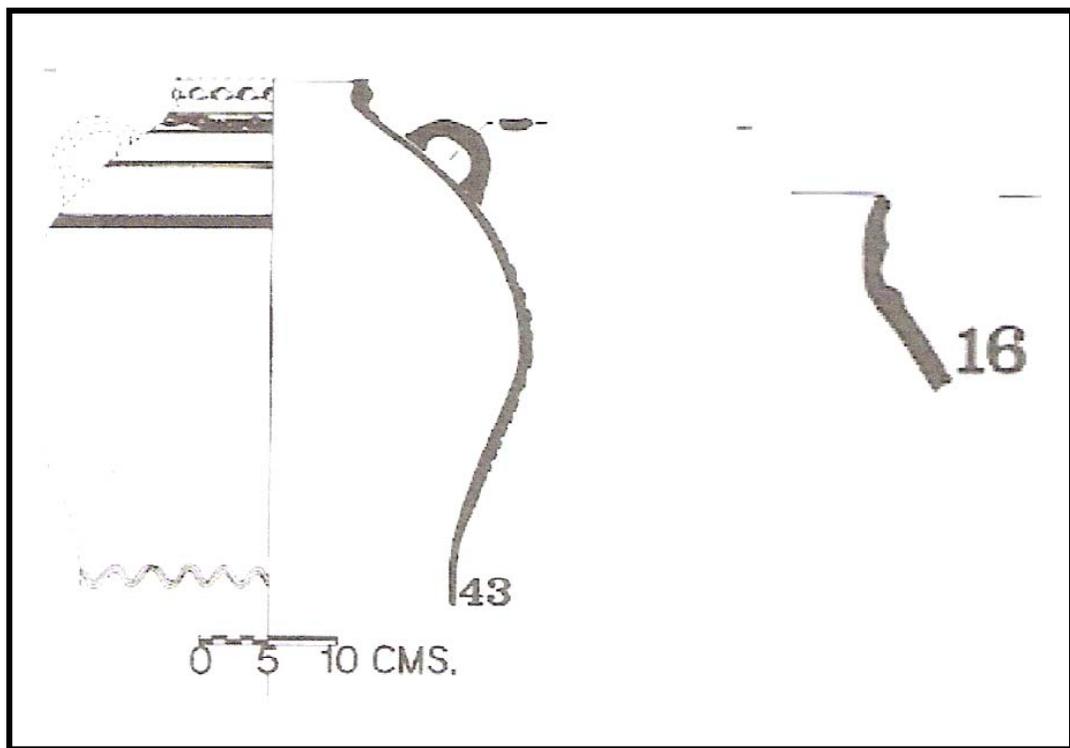


Figure 30b: Tushingam, Fig. 12: 16; 43

II. WATERMILLS AND GRINDING STONES IN WHS

The presence of watermills in the survey regions confirms agricultural use in these areas. The watermill was important in the Roman economy because of its ability to increase grain production.²²⁷ Dating these watermills however is especially problematic. Alison McQuitty stated that watermills in Jordan could have been built, rebuilt and reused during many different periods.²²⁸ What follows is a discussion on the history of watermills and analysis of those listed in the surveys.

Early references to a water powered wheel for grinding grain date to the third century BC in Philo of Byzantium's *Pneumatica*.²²⁹ But because Philo's full text has only been preserved in later Islamic literature, experts question the accuracy of his references to mills. Mention of mills could have been added to the later texts.²³⁰ Antipater of Thessalonica, ca. 85 BC, wrote a poem which unquestionably refers to a water powered wheel mill.²³¹ Strabo also refers to a watermill built in Pontus in the

²²⁷ Orjan Wikander, "Sources of Energy and Exploitation of Power," in *Oxford Handbook of Engineering and Technology in the Classical World*, ed. John Peter Oleson (New York: Oxford University Press, 2008), 141; J.G. Landels, *Engineering in the Ancient World* (Berkeley: University of California Press, 2000), 17.

²²⁸ Alison McQuitty, "Water-Mills in Jordan: Technology, Typology, Dating and Development," in *Studies in the History and Archaeology of Jordan V*, Dr. Khairieh Amr, Dr. Fawzi Zayadine, Muna Zaghloul, eds. (Amman: Department of Antiquities, 1995), 749.

²²⁹ Philo of Byzantium, *Pneumatica*, trans., Aya-Sofya, ed., Frank David Prager (Wiesbaden: Dr. Ludwig Reichert Verlag, 1974), 231, 234; Adam Lucas, *Wind, Water, Work: Ancient and Medieval Milling Technology*, vol. 8 of *Technology and Change in History* (Boston: Brill, 2006), 29.

²³⁰ John Peter Oleson, *Greek and Roman Mechanical Water-Lifting Devices: The History of Technology* (Toronto: University of Toronto Press, 1984), 184.

²³¹ Bryan Lawton, *Various and Ingenious Machines: Power Generation and Transport*, vol. 6.1 of *Technology and Change in History* (Boston: Brill, 2004), 223-224.

first century BC.²³² Watermills, therefore, were in use by the early Roman era.

However, the cost of building and operating these mills was prohibitive.²³³ As a result a region typically needed at least 200-400 people for a water powered mill to be of practical use.²³⁴ Slave labor also discouraged use of watermills.

In the early Roman Empire slaves provided a cheap and ready labor supply, making the watermill less appealing. After the third century, when the labor supply decreased, watermills became more important to the Roman economy. Diocletian's *Edict on Maximum Prices* in 301 mentions watermills among other forms of mills, i.e. human and animal powered.²³⁵ Unfortunately this does not infer their common use or location. Ammianus Marcellinus stated that by the 4th century watermills were used in Mesopotamia.²³⁶ The decline of slavery and exploitation of aqueduct technology for diverting and directing water suggests more widespread use in the Late Roman and/or Byzantine periods. Oleson contends that the use of aqueducts was "typically Roman".²³⁷

²³² Strabo, *Geography*, vol. 12, 3.40.

²³³ Robert I. Curtis, "Food Processing and Preparation," in *Engineering and Technology in the Classical World*, ed. John Peter Oleson (Oxford: Oxford University Press, 2008), 378.

²³⁴ Bryan Lawton, *Various and Ingenious Machines: Power Generation and Transport*, vol. 1 (Boston: Brill, 2004), 225; Keith Hopkins, "Rome, Taxes, Rent and Trade" in Walter Scheidel and Sitta von Reden, *The Ancient Economy* (New York: Routledge, 2002), 197-198.

²³⁵ K.R. Erim, Joyce Reynolds, "The Aphrodisias Copy of Diocletian's Edict on maximum Prices," *The Journal of Roman Studies*, vol. 63 (1973), 102. Text: Column II, Lines 18-20: "[M]ola caballa[ri]a sin(e) lapidibus, [Mol]a asinalis, [Mola] aquaria".

²³⁶ Orjan Wikander, *Sources of Energy and Exploitation of Power*, in Oleson, *Engineering and Technology in the Classical World*, 149, 150, 143; Ammianus Marcellinus, *The History*, G.P. Goold et al., eds., The Loeb Classical Library (Cambridge: Harvard University Press, 1935), 18.8.11.

²³⁷ John Peter Oleson, "The Origins and Design of Nabataean Water-Supply Systems," in *Studies in the History and Archaeology of Jordan* 5, 719.

MacDonald acknowledged the difficulties of dating the mills, particularly at sites associated with different periods of artifactual evidence, or no artifacts whatsoever. But he accepted E.B. Banning's dating of the WHS mills to the Roman-Byzantine era.²³⁸ Even if accepted, this date still encompasses seven centuries, a broad time period. Five mill sites, 169, 104, 89, 362 and 604, yielded significant numbers of Byzantine sherds, but three of these (169, 362 and 604) also had earlier evidence. Two other mill sites without sherds, 258 and 265, lie near two Byzantine fortified sites. These two plus, 362 and 604, lie in the central universe while all other mills are in the western universe. Mill sites, 167, 214, 85, 52 and 57 had no artifacts but were close to Byzantine sites. All these except site 57 cluster closely together along the northern portion of Wadi Afra. Although five mill sites, 276, 277, 278, 279, and 281 cluster away from any Byzantine sites, they were within a reasonable (ca. 3 km) distance from several Byzantine sites. All of the mill sites therefore can be reasonably associated with a Byzantine presence in the Wadi el Hasā area. Most lie in the western universe, which was more densely settled in the Byzantine era than in any other period.²³⁹

Although many mills were used in the Late Islamic era in Jordan, only two WHS sites yielded Early/Late Islamic ceramics. Site 604 along Wadi 'Afrā east of the *via nova Traiana* had both Early and Late Islamic sherds and site 52, along Wadi 'Afrā, had Late Islamic. It appears that the area near the mills was all but abandoned in

²³⁸Betlyon, King, Piccirillo, MacDonald, "Artifacts of Special Interest," in *Wadi el-Hasa Survey*, 24, 288.

²³⁹Ibid., 284-293.

subsequent periods.²⁴⁰ But only excavation and further research in the area will determine if these mills are indeed Roman and/or Byzantine.

Other mills found at archaeological sites in Jordan, however, present a more definitive picture. Parker found five mills in 1982 when excavating the Roman military fortress at Lejjūn, north of Wadi el Hasā. This fortress was abandoned in the mid 6th century. It seemed possible that Roman troops might have built the mills to supply grain. But subsequent excavation of several of these mills confirmed a Late Ottoman construction date.²⁴¹ When contacted recently, MacDonald did not offer further specific evidence from the WHS mills. Nevertheless evidence from the WHS suggests that sites 89, 104 and 169, along the northern part of Wadi Afrā, and 362, on Wadi Jā is, if excavated, could be Byzantine in date. These survey reports suggest several potential sites for excavation, but they lack the evidence for a detailed analysis of these mills.

²⁴⁰ Betlyon, King, Piccirillo, MacDonald, “Artifacts of Special Interest,” in *Wadi el-Hasā Survey* 286.

²⁴¹ Parker, *The Roman Frontier in Central Jordan*, vol. 1, 271-2; Alison McQuitty, “Water-Mills in Jordan,” in *Studies in the History and Archaeology of Jordan* 5, 746.

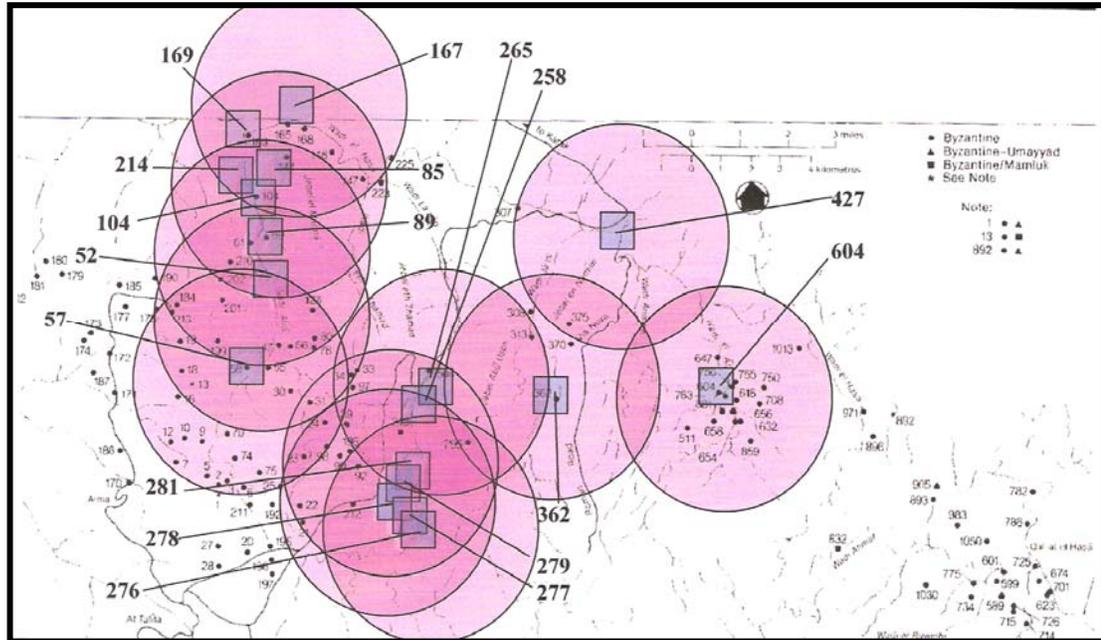
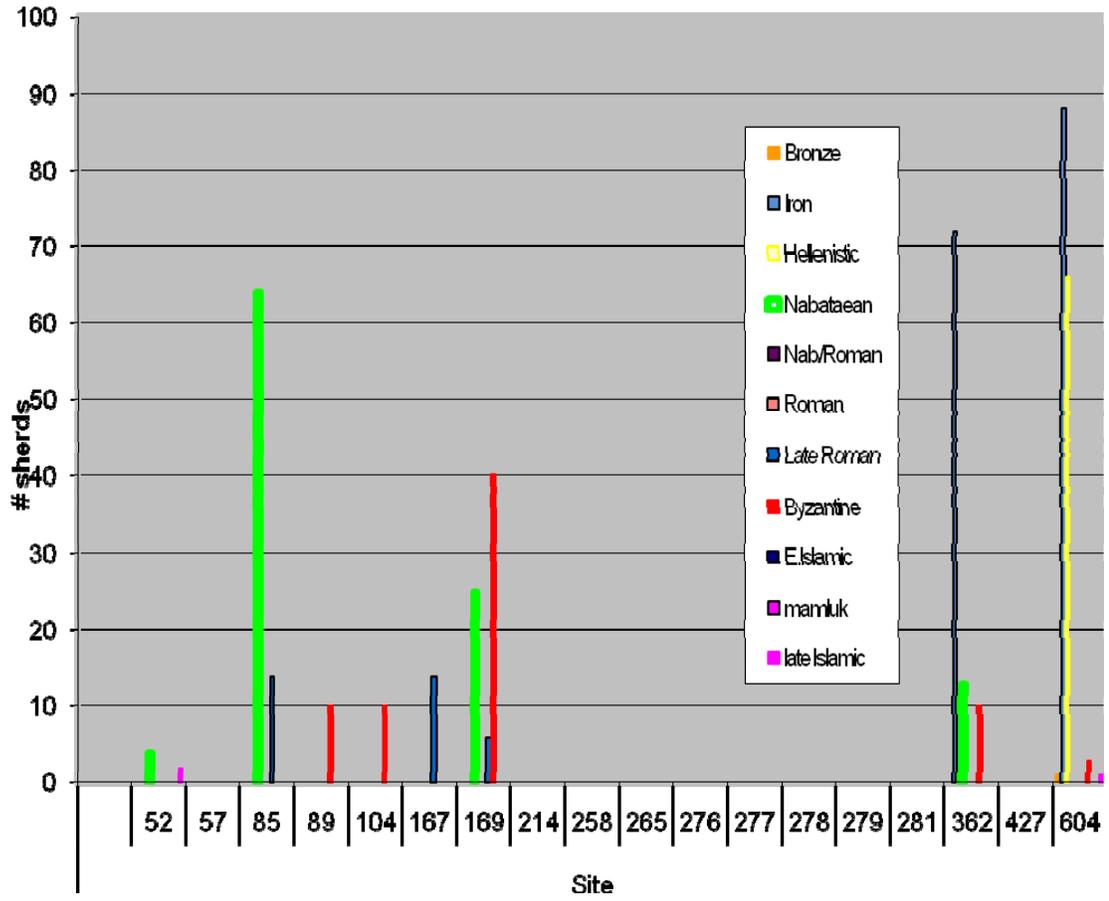


Figure 31: WHS Byzantine Sites: Mills in squares with 3 km radius

Table 9: WHS Sherds per Mill Site per Era



The region yielded more limited evidence of possible olive oil and wine production in the Byzantine period. Site 604 contained an olive press and site 199 had evidence of vine agriculture. Such sites may suggest that olives and grapes were cultivated along with grain, as has been suggested for the pre-desert wadis of Libya where olive trees and wheat each occupy different parts of the same landscape.²⁴² The Wadi el Hasa region is comparable to the semi-arid Libyan landscape, where rain water flowed through the wadis and over the terraces to be trapped in cisterns or wells for later use. Unfortunately these two sites alone are not strong evidence for extensive olive and grape production in the region.

III. MILLS AND GRINDING STONES

a. SGNAS

There were few mills, or possible mills, in the SGNAS region. While most Byzantine sites were located south of Wadi al-Dahal, only two mills were near this area, sites 112 and 155. Sites 91 and 77 in the northern section of SGNAS were predominantly Islamic. The mill at site 112 was very similar to that of site 77 with only Early Bronze and Islamic sherds and therefore likely was an Islamic mill. The southern-most mill was at site 155, a caravanserai used in multiple periods. It is therefore difficult to determine when the mill was actually constructed or used without

²⁴² Kevin Greene, *The Archaeology of the Roman Economy* (London: B.T. Batsford Ltd., 1986), 129.

diagnostic evidence. Consequently the mills of SGNAS offer insufficient evidence to confirm milling activity in the Byzantine era.²⁴³

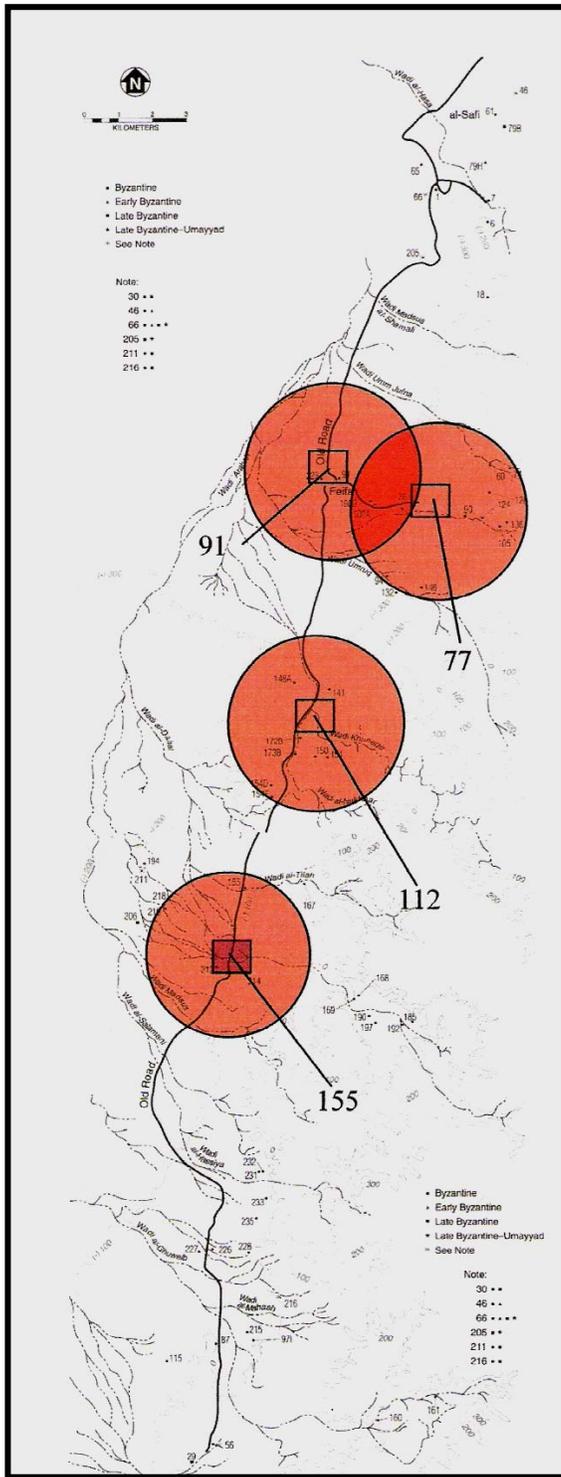


Figure 32: SGNAS Byzantine Sites, Mills in squares with 3 km radius

²⁴³ MacDonald, *Southern Ghors and Northeast Arabah Survey*, 259, 257, 261, 265.

b. TBAS

There were five mills in the TBAS area. Sites 1, 45 and 51 were all within or just outside of Zone Busayra. Site 1 was occupied from Late Roman through Byzantine times and then again during the Middle to Late Islamic period. There were several mill stones at this site as well as other pieces of basalt which were probably remains of mill stones. This was clearly a large center for milling grain from the surrounding area. Because of the numerous periods represented here it is impossible to determine if the mills were constructed and/or used in Roman or later times. Site 45 in Zone Busayra had no associated pottery. Site 51, just south of Busayra, was occupied during the Iron, Byzantine and Middle/Late Islamic periods. This again frustrates the potential for determining the mills construction date or dates of use. Site 151 was in at-Tafila and, although Byzantine pottery was dominant at this site, it was occupied in all but the Bronze Age and so its mills are not datable. Site 166, in the middle of the plateau in Zone 2, was occupied in the Early Roman/Nabataean, Byzantine and Middle/Late Islamic eras.²⁴⁴ As has been stated, mills were used in many places in Jordan during the Late Islamic period. Without excavation there is no compelling evidence to assume this is not true of this area as well.

There were also several sites with olive presses or mill stones in the western portion of the region near the milling sites. Site 4, an agricultural village in Zone Busayra occupied in the Iron, Late Roman and Byzantine eras produced several stones

²⁴⁴ MacDonald, Herr, Neeley "Site Descriptions," in *Tafila-Busayra Survey*, 151-2, 196, 204, 300, 318.

used for olive pressing. Site 138, near milling site 151, was an agricultural area with an ancient olive press.²⁴⁵ Site 165, near the mill at site 166, yielded predominantly Byzantine artifacts and is now surrounded by wheat fields, olive orchards and apricot orchards. And site 159, at the southern border, was a walled agricultural village with two grinding stones.²⁴⁶

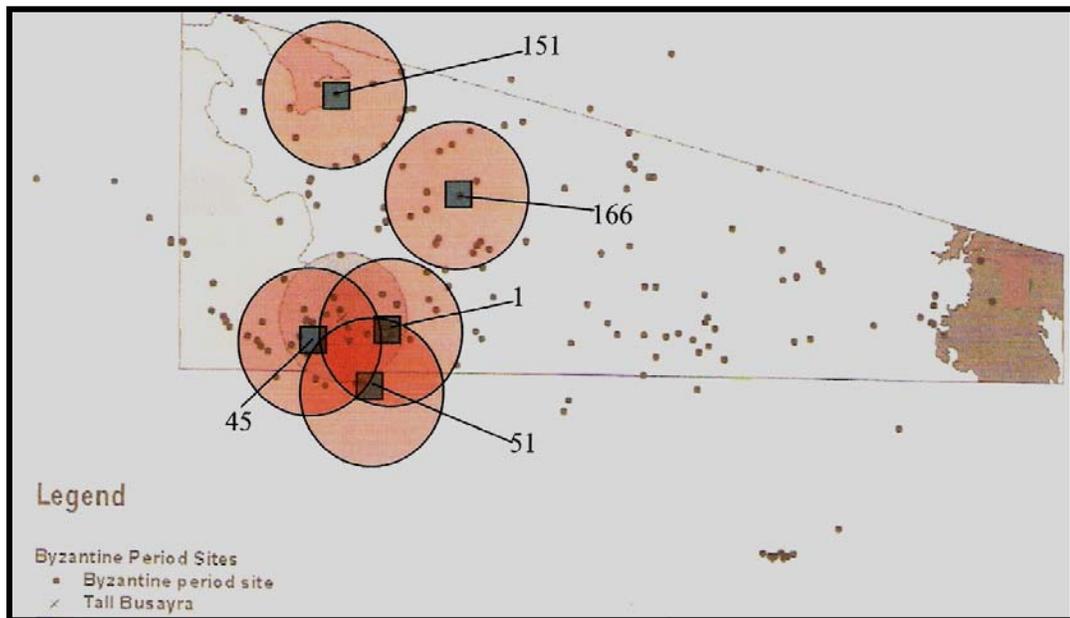


Figure 33: TBAS Byzantine Sites, Mills and 3 km radius

²⁴⁵ MacDonald, Herr, Neeley “Site Descriptions,” in *Tafila-Busayra Survey*, 156, 282.

²⁴⁶ *Ibid.*, 316, 308.

It is impossible to know or speculate with much certainty when the mills, olive presses and grinding stones were used in the TBAS area. However, if placed on the map within the respective 3 km radii, these sites could well have been utilized during the Byzantine time. This area was surrounded by Byzantine agricultural sites. It is noticeable that the area directly east of these sites was also intensively settled during the Byzantine era and yet seemingly devoid of mills, olive presses and grinding stones. These sites were represented by caravansaries, watch towers and some agriculture. Therefore, it seems that these sites more closely associated with the *via nova Traiana* did not need mills. Another issue is that all the mills lie in the western area settled throughout the Iron to Islamic periods. Therefore, determination of Byzantine use of the mills in the TBAS region is problematic.

The presence of mills in the three regions suggests extensive use for agriculture. Both the cost of constructing and running watermills and the amount of land needed to justify these watermills support this idea. However, the lack of sufficient datable artifactual evidence is challenging. Most mill sites yielded either little or no datable evidence or evidence from multiple periods. Further, dated artifacts collected from the mills were not published in any of the three surveys.

B. FURTHER EVIDENCE

In ancient times the area covered by the three surveys was an integral part of the regional trade system. Before the Romans arrived the indigenous inhabitants had already benefited from this trade. The Nabataeans traded throughout the region to become wealthy.²⁴⁷ Agriculture was always an important activity but trade was the area's real success. It was through these routes that agriculture and other goods were distributed. Solomon and later the Edomites used a trade route in the 1st millennium BC from the Mediterranean to the Red Sea and shared in the wealth that it afforded.²⁴⁸ Diodorus stated that the Nabataeans gained wealth through their use of and dominance over the trade of luxury items such as spices and incense in the 4th century BC and that in his own time, 1st century BC, the trade route ran through Petra from Upper Arabia to the coast of the Red Sea.²⁴⁹ Trade also passed westward through the Negev along Wadi Arabah.

A major trade route passed from Petra to Gaza through the Negev and was used through the 4th century.²⁵⁰ Some evidence in this paper might suggest that these trade routes were in use well into the Byzantine era. Although trade may not have been as prolific as in Nabataean times, evidence suggests more localized trade. Added to the artifactual evidence from the three survey areas, evidence from papyri and excavations

²⁴⁷ Strabo, *Geography*, 16.4.

²⁴⁸ Michael Avi-Yonah, *The Holy Land* (New York: Holt, Rinehart and Winston, 1972), 26.

²⁴⁹ Diodorus, *The Library of History*, The Loeb Classical Library, ed. T.E. Page, C.H. Oldfather, (Harvard: Harvard University Press, 1953), 3.42.5.

²⁵⁰ S. Thomas Parker, *The Roman Frontier in Central Jordan*, Vol. 2 (Washington D.C.: Dumbarton Oaks Research Library and Collection, 2006), 533.

in the Negev and southern Jordan argue for continued settlement and use of these routes.

The northern area of the Negev Desert, in present day Israel, lies on the western side of Wadi Arabah. It is similar geographically to the three survey regions and likewise was dotted with villages and many small farms occupied by the Nabataeans and later in the Roman and Byzantine periods. The Nessana Papyri and the Petra Papyri are documents from the Byzantine period recovered from sites within 25 -50 km of the survey regions. These documents and excavations in these adjacent regions are key primary sources that offer insights into the history of the survey regions which lack such sources.

I. The Negev

a. Nessana Papyri

The Nessana Papyri were found by H. D. Colt in 1935 while excavating Auja el-Hafir, ancient Nessana. The first documents were found in storerooms in the Church of Mary Mother of God, or the South Church. The papyri date to the 6th century and concern property rights of various people. A larger and more varied group of papyri from the early 6th century to the late 7th century appeared in the monastery church of S. S. Sergius and Bacchus, or the North Church.²⁵¹ These papyri include economic

²⁵¹ Casper J. Kraemer, Jr., *Excavations at Nessana: Non-Literary Papyri*, vol. 3 (Princeton: Princeton University Press, 1958), 3-8.

documents of soldiers, religious and literary works, administrative documents and personal documents of a certain Patrick, a church official, and his descendants.²⁵²

Trade in the Nessana Papyri is mentioned in just a few documents. Papyrus 47 spoke of a lost shipment of sea fish between Patrick and Stephan, another church official, in the early 7th century. The papyrus indicated that fish were missing from the shipment. Patrick was living in Nessana but Stephan's location is a mystery.²⁵³

Papyrus 90, late 7th century, was a record of the sales and trade in dates. These were sold in Nessana either by a large land holder, such as the church, or a group of farmers and were transported to buyers in Egypt. The documents indicated that the caravaners dealt with other unnamed towns also. They used donkeys as the pack animals for this caravan.²⁵⁴ Papyrus 89 was a journal of a trading expedition for a variety of goods, including animals, textiles, iron, oil, wine and barley. It mentioned that the caravan passed through "the Holy Mountain" or Mt. Sinai, Nessana and the desert, in the course of several months.²⁵⁵ The precise date of this document is unknown.²⁵⁶ Trade by water and land, specifically from Nessana to Egypt, was flourishing in the 6th and 7th centuries. However, of the 96 documents, 25% deal with agriculture.

The Nessana papyri are an important source about agriculture around the town. These documents included, among other topics already mentioned, agricultural yields, property ownership, tax on lands and types of crops grown in the 6th and 7th centuries.

²⁵² Casper J. Kraemer, Jr., *Excavations at Nessana*, 3-8.

²⁵³ *Ibid.*, 139-141.

²⁵⁴ *Ibid.*, 34, 261-271.

²⁵⁵ *Ibid.*, 251-260.

²⁵⁶ *Ibid.*, 34.

Landholders included the Church, *limitanei* (frontier soldiers assigned lands around their forts), and individual civilian farmers, most if not all of whom were free. The land was divided up into seed land, vineyards and vegetable or fruit gardens. This division of products is compatible with terrace agriculture along the wadis.²⁵⁷

Wheat seems to be the most important crop grown although there were vineyards for wine and olives. Papyrus 82, late 7th century, was a summary of a harvest of tenant fields. It listed wheat as the most important and prolific product. Each plot ranged from 5.36 to 24.12 acres and together formed a farm of ca. 71 acres about five miles from Nessana.²⁵⁸ The papyri indicated that plots were small. This could suggest either that they comprised parts of larger farms or many smaller farms. Documents also gave an indication of the population of Nessana. According to papyrus 69, ca. late 7th century, the tax paid to the military in wheat for one year in Nessana was 8700 kilos/290 bushels.²⁵⁹ Mayerson speculated that at a tax rate of 10% the annual yield of wheat in Nessana was 3,000 bushels. If the tax rate was 5% the annual yield would have been 6,000 bushels, a more likely amount in his view. He estimated that 6,000 bushels would have fed more than 1000 people.²⁶⁰

Olives were mentioned in papyri 60 through 67 and 69, from the mid 7th century. In papyrus 69 if the annual tax of oil was 5%, as Mayerson believed, then the annual yield was 2500 gallons. Dates were also grown according to papyri 90 and 91.

²⁵⁷ Philip Mayerson, "The Ancient Agricultural Regime of Nessana and the Central Negeb," in H. Dunscombe Colt, ed. et al., *Excavations at Nessana*, vol. I (London: British School of Archaeology in Jerusalem, 1962), 225-226.

²⁵⁸ Kraemer, *Excavations at Nessana*, vol. 3, 34, 237-238.

²⁵⁹ *Ibid.*, 199-200.

²⁶⁰ Mayerson, "The Ancient Agricultural Regime" in *Excavations in Nessana*, vol. 1, 229.

Figs were mentioned in papyrus 32 and although not indicated in the papyri, pomegranate seeds were found in the North Church of Nessana. Therefore it is possible these were grown locally also, although they might have been imports.²⁶¹

Magness reported that yields were “unexpectedly high” for this region. She indicated that there were “industrial-sized wine presses” found at Sobata, Elusa and Oboda. Magness said that the Byzantine period reflected a farming system where small, scattered farms imply a consolidation of land-holding or “individual farmers” and made the best use of the land and increased output as noted in legal and tax documents.²⁶² Bowersock noted that the Negev in Byzantine times was unparalleled in agricultural prosperity.²⁶³ This prosperity and productive farming appears to have continued through the early Islamic period.

The continuity of population and agriculture reflected in these documents both before and after the Muslim conquest suggest a peaceful and relatively stable transition from Byzantine to Islamic rule. Kraemer argued that this area was essentially ignored by the Muslim Arabs after the conquest.²⁶⁴

²⁶¹ Mayerson, “The Ancient Agricultural Regime” in *Excavations in Nessana*, vol. 1, 234-235; Kraemer, *Excavations in Nessana*, vol. 3, 30.

²⁶² Magness, *The Archaeology of the Early Islamic Settlement in Palestine* (Winona Lake, IN: Eisenbrauns, 2003), 90-92, 86.

²⁶³ G.W. Bowersock, *Roman Arabia*, 182.

²⁶⁴ Kraemer, *Excavations at Nessana*, vol. 3, 31.

b. Excavations in the Negev

The Negev in Israel and the survey regions in Jordan, although today separated by national boundaries were in antiquity connected by geography, culture, economics and a single government.²⁶⁵ Bienkowski and Van Der Steen argued that Iron Age Edom may have included both the Negev and the SGNAS regions. These regions prospered in part from copper mining in Wadi Arabah. Finkelstein maintained that the Assyrians in the 7th century BC built forts along a route from Busayra in Edom to Gaza to benefit from the mines.²⁶⁶

Many of the Negev settlements date to the Hellenistic era. Several towns in the Negev have been excavated, including the larger villages or towns of Nessana, Sobata and Oboda. The excavation of these places furnished evidence of a productive and prosperous people. Analysis of the Govrin survey of the Nahal Yattir provides more evidence about the Negev's rural areas.

Nessana was excavated from 1935 to 1937 by H.D. Colt and more recently by D.Urman. The excavation revealed a settlement dating back to the 2nd century BC. The Seleucid king Antiochus IV Epiphanes, in the early 2nd century BC, attempted to unify his conquests through Hellenization.²⁶⁷ An early fort at Nessana was Hellenistic in design and was later incorporated into a Byzantine church. Magness saw this structure

²⁶⁵ Piotr Bienkowski, Eveline Van Der Steen, "Tribes, Trade, and Towns: A New Framework for the Late Iron Age in Southern Jordan and the Negev," in *Bulletin of the American Schools of Oriental Research*, no. 323 (Aug., 2001), 21-47.

²⁶⁶ Israel Finkelstein, *Living on the Fringe*, Monographs in Mediterranean Archaeology, 6, ed. A. Bernard Knapp (Sheffield, England: Sheffield Academic Press, 1995), 152-3.

²⁶⁷ Michael Avi-Yonah, *The Holy Land*, 42.

as a sign of prosperity from the 1st century BC until the 1st century AD. A larger fort enveloping a good part of the acropolis was built in the 5th century. The fort was abandoned in the 6th century, coinciding with Justinian's withholding of back payments to the *limitanei*.²⁶⁸ Procopius reported that much of the military were demobilized during this time.²⁶⁹ Afterwards this fort was reused by the church as a monastery. There was evidence of decline in the town during the 5th century but then a relative building boom in the 6th and 7th. This again signals a return of economic affluence. The latest inscriptions date to 630 but the latest Nessana papyri date to 690, showing occupation of the town through the 7th century even after the Arab conquest.²⁷⁰

Sobata, located just east of Nessana, was founded in the Early Roman period and prospered well into the Byzantine era. Excavations were carried out here from 1934-36 by H.D. Colt, 1958 through 1960 by M. Avi-Yonah and 1979-1982 by A. Segal. The town comprised an area of 20 acres and was formally unfortified, but the houses were built in such a way to form a continuous barrier. The end of each street had a gate which could be locked. There were wide streets, three village squares, three churches, bathhouses and winepresses. Imported pottery included Late Roman "C" Ware or Phocaeen Ware, (dated from the mid 5th century to the mid 6th), African Red Slip Ware (ca. 530 to 625), and Fine Byzantine Ware (ca. 7th - 10th century). There were 44 coins dating from the reign of Constantius II (337-361). Magness concluded that

²⁶⁸ Magness, *The Archaeology of the Early Islamic Settlement*, 178.

²⁶⁹ Procopius, *Anecdota 6*, trans. H.B. Dewing, The Loeb Classical Library (Cambridge: Harvard University Press, 1935), 24:14.

²⁷⁰ Magness, *The Archaeology of the Early Islamic Settlement*, 179-80.

evidence attested to a flourishing town up to the 7th century AD and that the settlement lasted into the Abbasid period.²⁷¹

Oboda (modern Avdat) was excavated from 1958 to 1961, 1975 to 1977, 1989 and the 1990's. It is southeast of Sobata. Excavation revealed traces of late Hellenistic, early Roman and Nabataean pottery as well as a "Nabataean potter's workshop". A fortress was also built during Diocletian's reign (284-305) and two churches and a monastery were built in the Byzantine period. Agricultural works around the city include grape and date cultivation dated to the Byzantine period. A. Negev, who excavated all three villages, believed that Oboda was abandoned after the Muslim conquest. But Magness cited other excavations to contradict this date.²⁷²

Mampsis, the last of the Negev towns covered in this paper, is northeast of the other three. A. Negev also excavated here in 1965-67, 1971-2, and 1990. The town was fortified in Diocletian's reign. Finds include two Byzantine churches, imported pottery (Late Roman "C" ware, African Red Slip Ware and Cypriot Red Slip Ware) from the late 6th and early 7th century. Its presence on the 6th century Madaba map and many other Byzantine buildings show that it was a fairly important town.²⁷³ Arabic graffiti and new buildings dating to the Islamic rule attest to a continued occupancy during that time.²⁷⁴ This and the other Negev towns were surrounded by a vast agricultural hinterland which aided in their prosperity.

²⁷¹ Magness, *The Archaeology of the Early Islamic Settlement*, 185-187.

²⁷² *Ibid.*, 187-188.

²⁷³ Bowersock, *Roman Arabia*, 182.

²⁷⁴ *Ibid.*, 188-190.

The central Negev is characterized by a few large wadis that drain into the Wadi Arabah, which extends from the Dead Sea to the Gulf of Aqaba. Ridges and valleys make up the contours of the wadis. Surveys have found a vast complex of Byzantine terraces on the wadis and farms in the hinterlands of the Negev towns. Terracing indicates areas which were cleared and leveled for crops. Farms were relatively plentiful near the cities but became scarce at greater distances. Magness stated that the Byzantine policies of “establishing an agricultural frontier” advanced the use of settled farmland.²⁷⁵ Pottery at the farm sites date through the Umayyad period, suggesting continued settlement through the 7th century and perhaps into the 8th.²⁷⁶

The archaeological data from the hinterland of the northern Negev shows a broad network of farms throughout the region. The Byzantine period reflected a system characterized by small, scattered farms that made the best use of the land and increased yields from former times.²⁷⁷ An advanced irrigation system was employed which channeled rain runoff through the terraces; some of these date as far back as the 1st century AD.²⁷⁸ Although the Nessana papyri are not explicit about whether these farms belonged to small, self-sustaining families or were part of larger holdings, the Petra papyri do give some specific information on some large landowners around this city.

²⁷⁵ Magness, *The Archaeology of the Early Islamic Settlement*, 133.

²⁷⁶ Magness notes the debate on this issue between Haiman and Avni on pages 136-138.

²⁷⁷ Magness, *The Archaeology of the Early Islamic Settlement*, 90-92, 86.

²⁷⁸ Bowersock, *Roman Arabia*, 60.

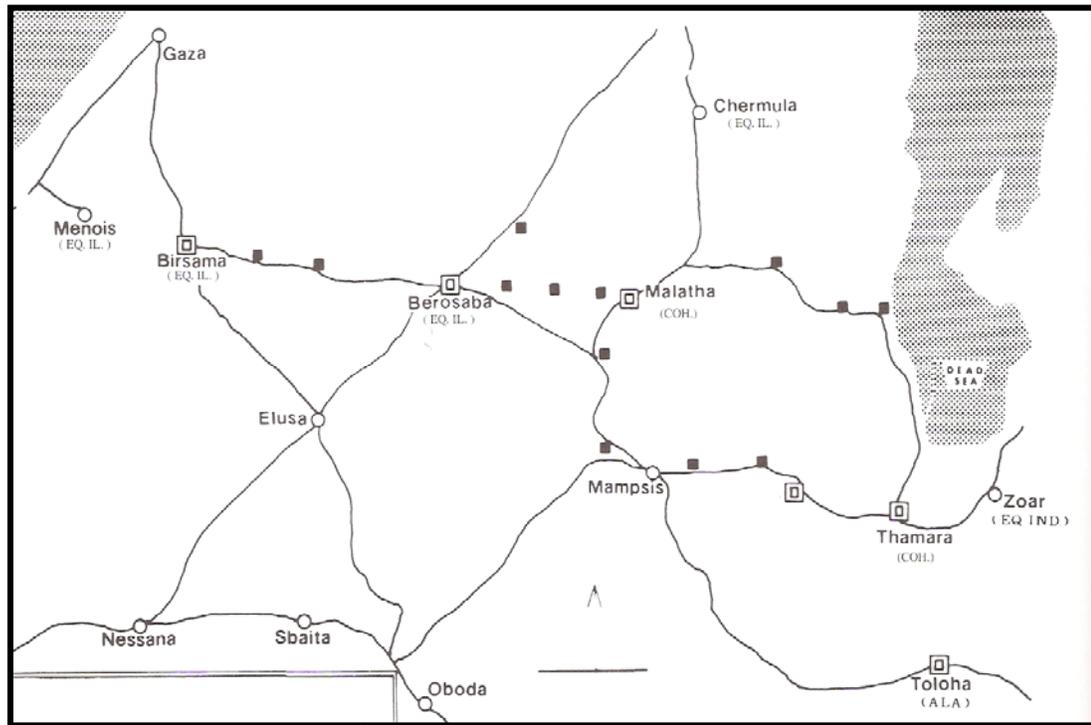


Figure 34: Negev Towns

II. Petra

a. Petra Papyri

Petra, the capital of the Nabataean kingdom and a prosperous city, has yielded evidence for extensive land use around that city in the Byzantine period. In 1993 archaeologists excavated a Byzantine church in Petra and discovered carbonized papyri, which were stored and accidentally burned, in a side room. The texts were primarily the correspondence, legal documents and economic information about an individual

family. According to these 6th century papyri, some of Petra's wealth at that time came chiefly from the land.²⁷⁹ However, it must be stressed that these documents are much more limited in scope than the Nessana papyri, particularly since they primarily concern only a single family.

Although Petra had always been involved in agriculture, this increased after the region became a Roman province.²⁸⁰ The subjects of the Petra papyri, Theodoros and his family, prospered greatly from landownership.²⁸¹ Theodoros owned a great deal of land in the region around Petra as well as in Augustopolis, east of Petra, in *Palaestina Tertia*, and in Gaza, north of Nessana. One document specifies that Theodoros, and previously his father, owned a vineyard.²⁸² Some of Theodoros's land was in the Negev and he could easily have used those abundant wine presses in Sobata, Elusa and Oboda. Evidence of "Gaza amphorae" scattered in the entire Mediterranean region confirm extensive grape cultivation and wine production for export from the area just north of the Negev during the Byzantine period.²⁸³

The Petra papyri also mention 350 other wealthy people from the area.²⁸⁴ Since these wealthy landowners leased much of their land to tenant farmers, it would have

²⁷⁹ Jaakko Frosen, Anitti Arjava and Marjo Lehtinen, eds., *The Petra Papyri I*, American Center of Oriental Research Publications 4 (Amman, Jordan: American Center of Oriental Research, 2002), 4.

²⁸⁰ Glen Markoe, ed., *Petra Rediscovered: Lost City of the Nabataeans* (New York: Harry N. Abrams, Inc., 2003), 252, 103.

²⁸¹ Frosen, *The Petra Papyri I*, 4.

²⁸² *Ibid.*, 10, 36, 101. Note: the editors of *The Petra Papyri I* state that Augustopolis is most likely Udhruh.

²⁸³ Magness, *The Archaeology of the Early Islamic Settlement*, 91; Ze'ev Safrai, *The Missing Century: Palestine in the Fifth Century: Growth and Decline* (Leuven: Peeters, 1998), 47.

²⁸⁴ Frosen, *The Petra Papyri I*, 10.

required many workers to work these lands.²⁸⁵ As discussed previously, because hundreds of farms have been detected by the archaeological surveys, it is reasonable to conclude that in the 6th century the hinterlands of both Petra and the Negev towns were occupied by many small farms, perhaps worked by small free-holders as well as tenants, while wealthy landowners lived in Petra, Nessana and the other towns. The *Vita Hilarionis*, a hagiography about a monk from Gaza, mentioned villas and farms in the vicinity. Another hagiography, of Porphyrius of Gaza, also mentioned some of the wealthy landowning residents of Gaza.²⁸⁶ While it is not known how many farms were owned by large landowners, there were clearly many large and small farms during this time. Despite the apparent prosperity around Petra, the papyri also mention two villages which were deserted by the 6th century, one of which, Baith el-Alkeb, was agricultural land where Theodoros still owned a vineyard.²⁸⁷

b. Petra Archaeology

Petra has been excavated for many years. Although the Nabataean capital at Petra had been inhabited throughout much of the historical period, for many years experts believed that Petra fell into disrepair and was nearly abandoned after the earthquake of 363. Most early excavation focused on Nabataean and Roman Petra, but recent excavations have revealed much about the city in the Byzantine period. In the 1990's three Byzantine churches had been excavated in Petra. The American Center of

²⁸⁵ Markoe, *Petra Rediscovered*, 251.

²⁸⁶ Safrai, *The Missing Century*, 42.

²⁸⁷ Antti Arjava, Matias Buchholz, Traianos Gagou, eds., *The Petra Papyri III* (Amman: The American Center of Oriental research, 2007), 39.

Oriental Research conducted excavations beginning in the 1990's. They found that after the earthquake an apse and other rooms were added to the Ridge Church. And then by the mid 5th century, the Nabataean era Urn Tomb was converted to a church and another large church and possible bishopric were built. This strongly suggests a growing and thriving population. All three churches were renovated in the 6th century. It is the Petra church, the last one built, which produced the papyri. Experts believe that Petra was prosperous into the 6th century because it could support these three churches.²⁸⁸

Close to Petra, another site yielded evidence of Byzantine occupation. The Finnish Jabal Harûn Project concentrated on the Mountain of Aaron near Petra. This is the historic burial place of Aaron, Moses's brother. This was a Byzantine monastery and pilgrimage site, used from the 5th through 7th centuries.²⁸⁹ Structures nearby, although built in the Nabataean or Roman era, were reused in the Byzantine period. The team also found 30 "major sites" near this complex, including water management facilities and terrace walls.²⁹⁰ Patricia M. Bikai excavated at al-Amti Canyon in Petra in 2003. The buildings were originally thought to be a caravan stop. However evidence of irrigation for fields and wine presses confirmed that the land was used for agriculture. Dating the use of the complex was difficult but evidence ranged from the

²⁸⁸ Patricia Maynor Bikai, "The Churches of Byzantine Petra," in *Near Eastern Archaeology* vol. 65, no. 4 (Dec. 2002), 271-272/

²⁸⁹ Jaako Frösén, Zbigniew T. Fiema, "Excavations at a Byzantine Pilgrimage Site and Monastic Center: The Finnish Jabal Harûn Project 2000," *Near Eastern Archaeology*, vol. 64, no. ½ (Mar.-June, 201), 65.

²⁹⁰ *Ibid.*, 66.

1st through the 5th centuries.²⁹¹ These excavations in and around Petra, as well as the Petra Papyri, document significant Byzantine occupation in the area into the 6th century.

III. *Limes Arabicus* Project

S. Thomas Parker conducted an archaeological excavation of the legionary base at el-Lejjūn, north of Wadi el Hasā, between 1980 and 1989. His team also surveyed the Roman frontier zone in this region east of the Dead Sea. The major purpose of this project was to gather information on the Roman frontier in Arabia.²⁹² Although north of MacDonald's survey area on a plateau east of the Dead Sea, the information from this project helps to understand the entire Roman frontier, including in the region to the south.

The fortress was built during under Diocletian (284-305). Diocletian initiated a buildup and fortification of the frontier after the crisis of the 3rd century.²⁹³ The fortress was occupied by the Fourth Mars Legion through the 4th and 5th centuries. An earthquake in 551 left the fortress nearly abandoned.²⁹⁴ It is during the 6th century that the *foederati* (Arab allies serving Rome under a treaty) assumed military responsibilities including patrolling the borders. Therefore it is reasonable to assume that the garrison at el-Lejjūn was no longer needed to defend the frontier.²⁹⁵ Although the frontier system of fortifications was basically abandoned by the Late Byzantine period, people

²⁹¹ Stephen H. Savage, Kurt A. Zamora, Donald r. Keller, "Archaeology in Jordan, 2003 Season," *American Journal of Archaeology*, vol. 108, no. 3 (Jul, 2004) , 439-441.

²⁹² Parker, *The Roman Frontier in Central Jordan*, vol. 1, 5-8.

²⁹³ Butcher, *Roman Syria*, 84-86.

²⁹⁴ Parker, *The Roman Frontier*, vol.1, 120-121.

²⁹⁵ Butcher, *Roman Syria*, 70.

were not left entirely unprotected. Between the *foederati* and some remaining *limitanei*, some areas must have had some measure of security. The Ghassanids, main Arab allies tied to Rome, assumed the task of protectors.²⁹⁶ Miller reported Late Byzantine sherds at two forts along Wadi Mūjib near the *via nova Traiana*.²⁹⁷ Perhaps the areas south and west of Wadi el Hasā as well as the eastern region of the Tafila-Busayra survey were some of these protected areas.

IV. Aila

Aila, in southern Jordan along at the coast of the Red Sea, was also excavated by Parker from 1994 until 2003.²⁹⁸ Aila was an important transfer point for goods moving between the land and sea trade routes.²⁹⁹ It was a Nabataean city built in the 1st century BC. Parker's excavations confirmed that the city was involved in trade of many kinds of goods. It also processed copper. Aila was situated at the southern end of Wadi Arabah, where copper mining was conducted for centuries. The evidence from Aila suggests an intensification of trade during the 4th century (the beginning of the Byzantine period) and that Aila was an important port through the Early Islamic period.³⁰⁰ Fish bones from the Red Sea recovered both at Petra and at various Negev sites likely travelled on the route through Wadi Arabah from Aila and wood from Wadi

²⁹⁶ Walter E. Kaegi, *Byzantium and the Early Islamic Conquests* (Cambridge: Cambridge University Press, 1992), 30, 119.

²⁹⁷ Parker, *The Roman Frontier in Central Jordan*, vol. 2, 566.

²⁹⁸ S. Thomas Parker, "Resources, routes, settlement patterns and interaction in the Wadi Arabah" in *Crossing the Rift*, Piotr Bienkowski, Katharina Galor, eds. (Oxford: Oxbow Books, 2006), 223-230.

²⁹⁹ Strabo, *Geography*, vol. 7, 16.2.40; 16.4.4.

³⁰⁰ Parker, "Resources" in *Crossing the Rift*, 228-9, 223.

Arabah was probably used for Aila's ceramic production.³⁰¹ Because Aila was a terminus for several trade routes, it follows that the survey areas, especially routes through Wadi Arabah, would have been active through this period, including the Byzantine era.

V. Archaeological Work in the Region after MacDonald

Since MacDonald's surveys, archaeological work in this region has continued to flourish. The *American Journal of Archaeology* reports annually on new and ongoing work in Jordan. Excavations or other subsequent work has confirmed the dates of several sites as originally proposed by MacDonald. For example, in 1984 Francois Villeneuve excavated at Khirbet edh-Dharīh, site 254 in WHS which MacDonald suggested was an important Nabataean civic center. Villeneuve concurred, in part from the 2nd century pottery evidence.³⁰² The 1991 *AJA* report included several new projects including the Wadi Hasā Palaeolithic [*sic*] Project, copper mines of Feinan in Wadi Arabah, and the Southeast Dead Sea Expedition. The first of these investigated paleolithic sites from the Wadi el-Hasā Survey in order to rediscover geological and more prehistoric evidence from the Pleistocene Lake Hasā. These findings broadly concurred with MacDonald's assessment of the area in the prehistoric period. Hauptmann sought to discover what part Feinan, east of MacDonald's Bronze Age smelting sites along Wadi Fidan, played in copper mining, smelting and trade. His

³⁰¹ Parker, "Resources" in *Crossing the Rift*, 228-9.

³⁰² MacDonald, *Wadi el Hasā Archaeological Survey*, 204; Parker, *The Roman Frontier in Central Jordan*, vol. 1, 20, 43, 45.

investigation centered on the Chalcolithic, Bronze and Iron Ages but included information through the Roman period. Thomas Schaub worked in Feifa with its large cemetery and other remains from the Early Bronze Age.³⁰³ In SGNAS MacDonald suggested more archaeological focus on these cemeteries. Schaub also excavated Khirbet Khanazir, near site 141 of SGNAS, for Bronze Age evidence.³⁰⁴ His findings also confirmed MacDonald's proposed Iron Age settlement there.

There have been a few other excavations in and around MacDonald's survey regions. However, they have concentrated mainly on prehistoric or Islamic periods.³⁰⁵ The few projects in or around the survey region still leave much of it untouched with little focus on the Byzantine period. One exception is the work by Politis at Deir 'Ain Abata, site 46 in SGNAS, the monastery and church of St. Lot overlooking the Dead Sea and depicted on the Madaba mosaic map. Here excavation confirmed not only this identity but the broad outline of occupational periods suggested by MacDonald's survey.³⁰⁶ This underscores the fact that the Southern Ghors and Arabah region has witnessed more subsequent work than either Wadi el Hasā or the Tafilā-Busayra regions. Another exception is the Jordanian-French excavation at Khirbet edh-Dharīh, located on the *via nova Traiana* just south of Wadi el Hasā. Excavation has revealed an

³⁰³ Bert de Vries, "Archaeology in Jordan," *American Journal of Archaeology*, vol. 95, no. 2 (Apr., 1991), 255, 260-262.

³⁰⁴ *Ibid.*, 253-280.

³⁰⁵ Virginia Egan, Patricia M. Bikai, "Archaeology in Jordan," in *American Journal of Archaeology*, vol. 103, no. 3 (July, 1999), 485-520; Stephen H. Savage, Kurt A. Zamora, Donald R. Keller, "Archaeology in Jordan," in *American Journal of Archaeology*, vol. 105, no. 3 (July 2001), 427-461; Stephen H. Savage, Kurt A. Zamora, Donald R. Keller, "Archaeology in Jordan," in *American Journal of Archaeology*, vol. 108, no. 3 (July, 2004), 429-445.

³⁰⁶ Politis, "Of Agios Lot at Deir Ain Abata, Jordan" in *Bible and Spade* 12 (1999), 87-89.

agricultural village that included a Nabataean temple later converted into a Byzantine church.³⁰⁷ The Nabataean period for this site was represented in WHS; however MacDonald reported no Byzantine evidence.³⁰⁸ Although archaeological work continues in Jordan, there still have been few excavations in the interior of the WHS and TBAS regions.

C. Synthesis and Conclusion

I. Synthesis of Information

MacDonald's three surveys provided a wealth of new evidence but also inevitably raised new questions. The periods of intensification and abatement are clear from survey evidence. The Bronze Age was a time of abatement along the eastern wilderness. Both WHS and TBAS were virtually devoid of evidence from this time. SGNAS, however, showed intensification in the Early Bronze Age. The exploitation of the copper mines could account for this anomaly. But, after the Early Bronze Age, SGNAS settlements were also apparently abandoned. Even the potential wealth produced by mining copper was not enough to keep people settled there.

Following this apparent absence of settlements, the presence of sedentary folk returned and intensified through the Iron Age. The WHS and TBAS regions were crossed with trade routes, caravansaries and villages. Agriculture increased, if for no other reason than to feed this influx of people. A trade route ran from Busayra into the

³⁰⁷ Bikai, Deborah Kooring, "Archaeology in Jordan," *American Journal of Archaeology*, vol. 99, no. 3 (Jul., 1995), 521-522.

³⁰⁸ MacDonald, *Wadi el Hasā Archaeological Survey*, 223-224.

Arabah and intensive mining resumed in the SGNAS region. The Edomite kingdom emerged and this region seemed to flourish during the Iron Age.

The evidence suggests that the entire region experienced a sharp decline in sedentary population during the Persian (539-332) and Hellenistic (332-3 BC) periods. Turmoil and wars apparently drove people from the frontier regions. Although this appears to be a time of abatement, the Nabataeans were uniting in some fashion. It is only recently that scholars have begun to try to distinguish when and how the Nabataeans formed their kingdom, in part by more precise dating of their distinctive pottery, which seemingly appeared in the mid 2nd century BC. So the period of abatement could be much shorter than previously recognized.

The Roman period (63 BC-AD 324) is generally seen as a time of intensification. Rome conquered or became allied with indigenous peoples (in this case the Nabataeans) and they both moved into marginal lands. The Romans built or repaired roads and fortifications to guard the routes and people from nomadic raiding and foreign attack. The now peaceful frontier was again repopulated. Mining resumed in Wadi Arabah.

The Byzantine period (324-640) witnessed continued settlement throughout all three survey areas. There were more farms and villages than at any other time as evidenced by tables 2, 5 and 8. Watermills could have been built at the time because thriving agriculture could compensate for building costs. This was the most intensively settled and presumably productive time according to the artifactual evidence. The question is how long did it last. Did abatement begin when the borders

were abandoned by the Roman *limitanei*? Or did the frontier remain stable enough under the Arab *foederati* for settlement to continue unhindered? With the information from the three surveys, papyri from Nessana and Petra, and evidence of thriving settlements in the Negev, it would appear that some significant number of people continued to live and farm and trade in all these regions until the 7th century. But only excavation, closer ceramic analysis of the existing survey collections, and architectural analysis will determine those answers.

II. Future Work

Surface surveys are meant in part to be preliminary for future archaeological excavations. Because of the difficulties presented by MacDonald's reports, such work will be more difficult. There are several responses to this problem. First, pottery from the surveys should be re-evaluated, in light of more recent research for more accurate dating. Scholars would then have a more nuanced narrative of intensification, abatement and land use. The supposed absence of Byzantine evidence along the *via nova Traiana* in the WHS region is also problematic. The clear presence of Byzantine use of this road in TBAS suggests a reexamination of the WHS results. To be of more use to interested scholars, each publication should be supplemented with more specific and detailed information.

Aside from the problems with the survey publications, some areas for further investigation are apparent. Aside from the *via nova Traiana* in the WHS region discussed earlier, another area needing research is the Byzantine settlements in eastern region of TBAS. Historically the eastern regions were thought to be abandoned during the Late Byzantine period yet there is a definite intensification of settlement here,

according to the survey evidence. A reexamination of both the desert fringe and the *via nova Traiana* in TBAS could yield valuable evidence. Lastly, the plateau of WHS was dotted with farms and terracing, with nearby mills, in the Byzantine period. Only excavation at or near the mills may provide definitive evidence for Byzantine use in the WHS region. Only excavation and evaluation of architectural, coins, ceramics and other evidence will establish settlement periods more definitively. This marginal region had long been ignored or overlooked in favor of more accessible or exciting areas. But MacDonald must be thanked, both for recovering an enormous amount of evidence and publication of much of it in a prompt and timely manner. The information from his three surveys appears to suggest a strong Byzantine presence in much of the region that should prompt further research. Hopefully, this thesis will be a catalyst in this regard.

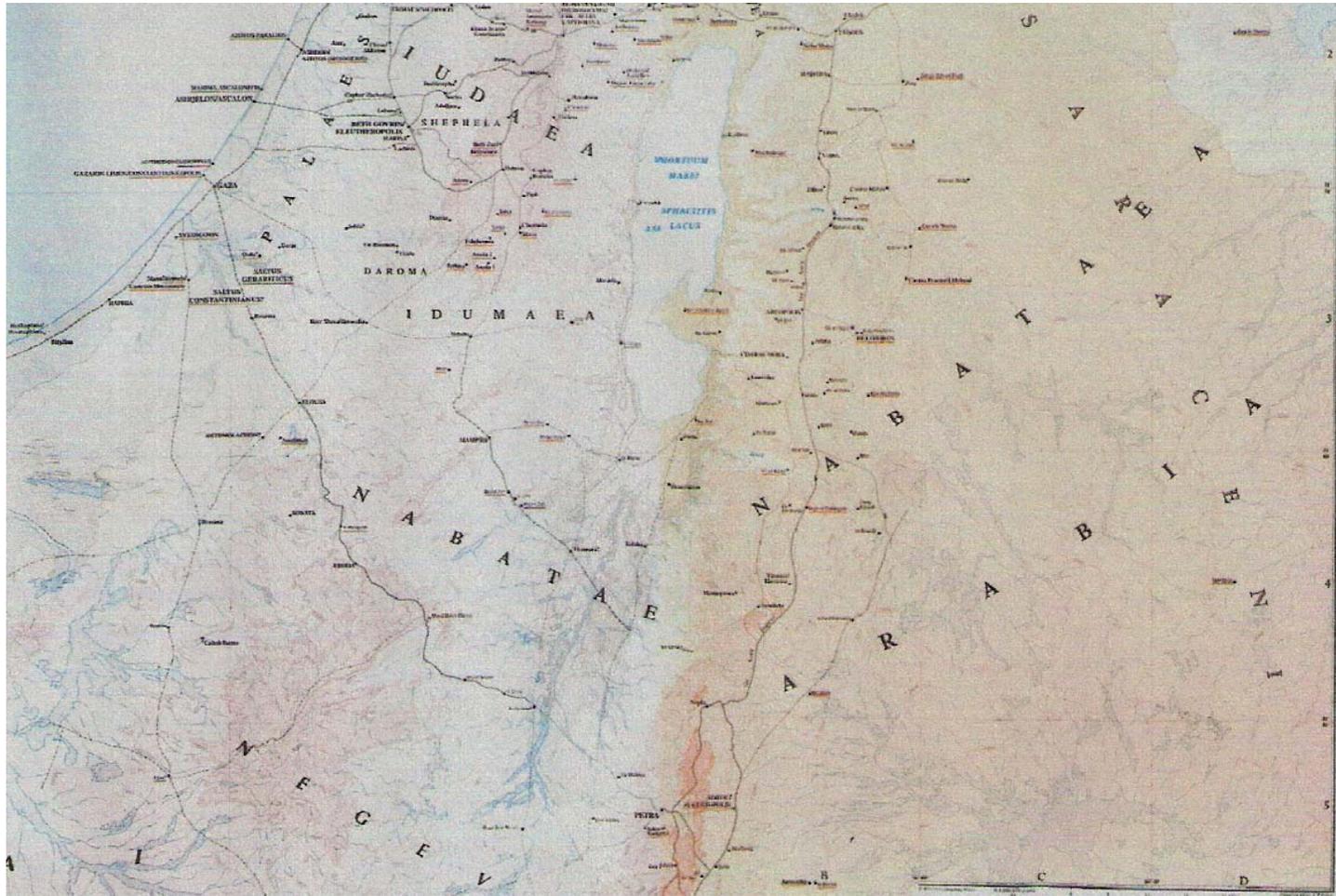


Figure 35: Roman Roads



Photo 1. Wadi Ahmar; looking north, WHS



Photo 2. Plateau in western universe; looking north, WHS

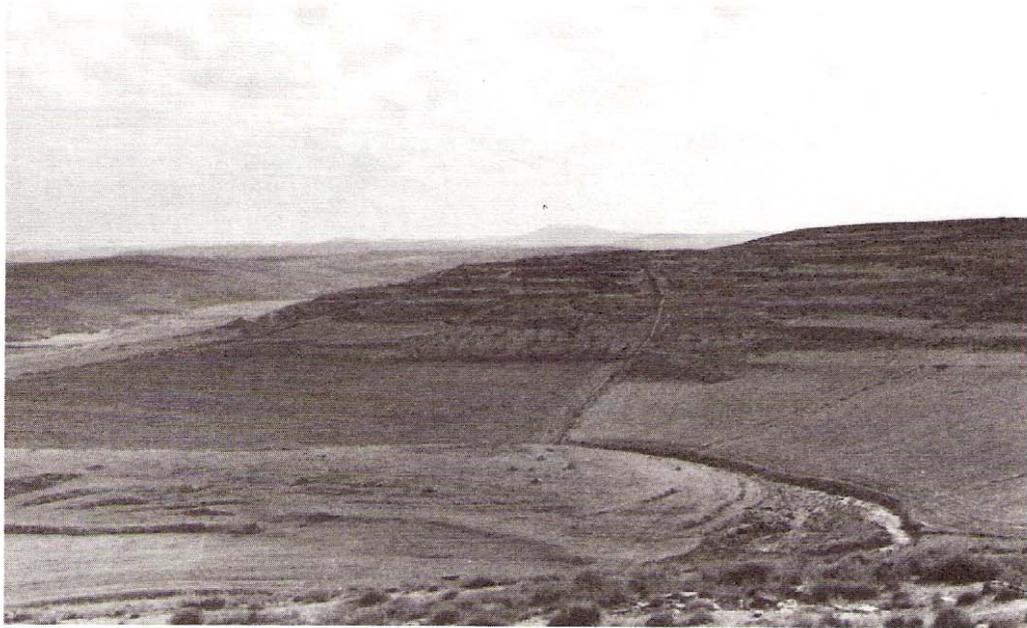


Photo 3. Site 23, Mashmil/El Mushimmin, WHS

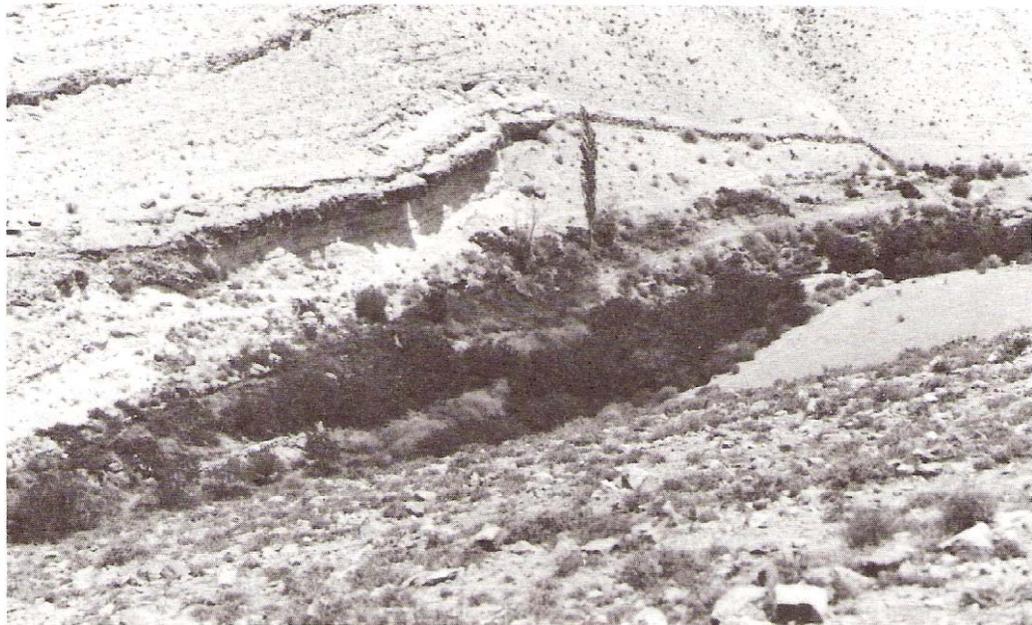


Photo 4. Wadi el Ali; from Site 616 , WHS



Photo 5. Site 75, ancient Feifa, SGNAS



Photo 6. Site 108, Rujm Khuneizir, SGNAS



Photo 7. Structures at Site 141, SGNAS

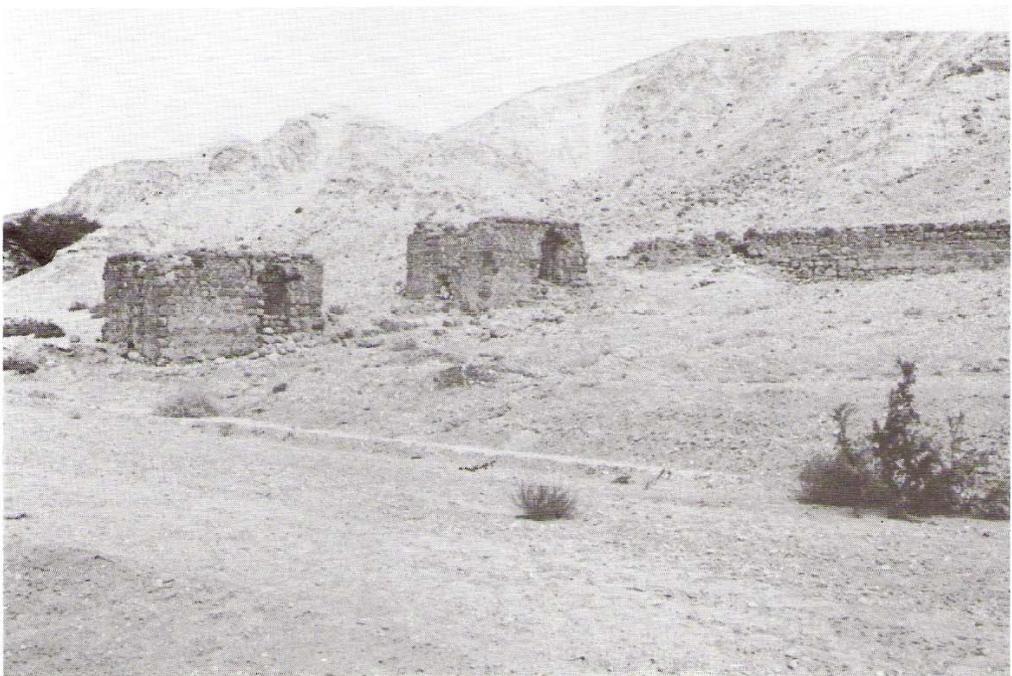


Photo 8. Site 77, aqueduct, milling, SGNAS



Photo 9. Site 46, Deir Ain Abata, SGNAS



Photo 10. Arches at Site 46, Deir Ain Abata, SGNAS

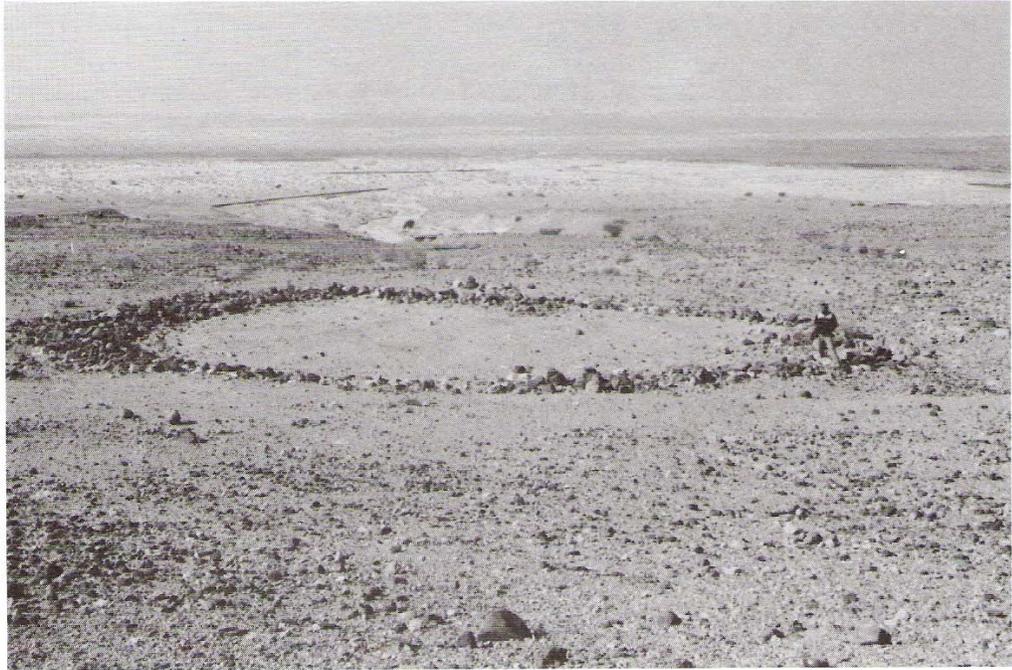


Photo 11. Site 240, stone enclosure, SGNAS



Photo 12. Site 112, aqueduct, SGNAS

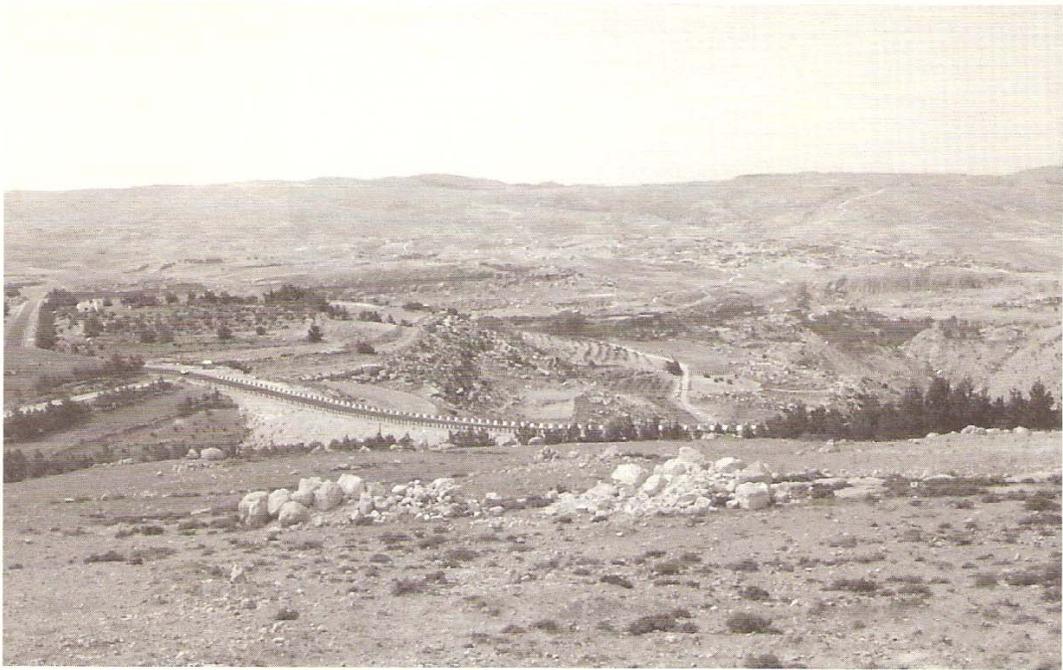


Photo 13. Busayra looking southwest, TBAS



Photo 14. Milling Stone, TBAS



Photo 15. Olive Press, TBAS



Photo 16. Milestone along Hajj Route, TBAS



Photo 17. Cistern at Khirbat Masala, TBAS



Photo 18. Cistern, TBAS

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