

THE AYL TO RĀS AN-NAQAB ARCHAEOLOGICAL SURVEY, SOUTHERN JORDAN — PHASE 1 (2005): PRELIMINARY REPORT

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Introduction

“The Ayl to Rās an-Naqab Archaeological Survey” (ARNAS) was in the field for its first season from April 27 to June 12, 2005. Team members were: A. Bradshaw, computer, GPS, and photography; J. Corbett, GIS and mapping; G. A. Clark, lithics; L. G. Herr, ceramics; B. MacDonald, director; and A. Rawshdeh, representative of the Department of Antiquities. They were housed in the town of aṭ-Ṭayyiba, to the northwest of the survey territory and to the south of Wādi Mūsā.

The main objective of the project is to discover, record, and interpret archaeological sites within the Ayl to Rās an-Naqab region — in an area comprising ca. 806km². Other objectives include: to study the settlement patterns of the area from the Lower Paleolithic (ca. 1.4mya) to the end of the Late Islamic period (1918AD); to examine the Pleistocene lakes in the area; to investigate further the *Khaṭṭ Shabīb* or “Shabīb’s Wall” (Kirkbride 1948; Abujaber 1995; Kennedy 1982: 163-66; Kennedy and Bewley 2004: 138-39; MacDonald 2004: 280; MacDonald *et al.* 2004: 343; Parker 1986: 89), and to compare the findings of this project with those of the project director’s previous surveys in the area of ancient Edom, namely, “The Wadi al-Hasa Archaeological Survey” (1979-1983) (WHS) (MacDonald *et al.* 1988); “The Southern Ghawrs and Northeast Archaeological Survey” (1985-1987) (SGNAS) (MacDonald *et al.* 1992); and “The Tafila-Busayra Archaeological Survey” (1999-2001) (TBAS) (MacDonald *et al.* 2004).

Geographical and Environmental Context

The area being investigated is part of the southern segment of the Transjordanian Plateau in the region from the village of Ayl in the north to Rās an-Naqab in the south, from the edge of the escarpment in the west, and into the Jordanian desert on the east. The area is ca. 26 (N-S) x ca. 31 (E-W) km (at its widest). The western extremity of the territory is the 1100m line while the

eastern extremity extends to the 1200m line towards the city of Ma‘ān (**Fig. 1**). (UTM coordinates for the study area are: 736100/3345500 (NW corner); 754200/3345500 (NE corner); 734350/3319750 (SW corner); and 760700/3319750 (SE corner).

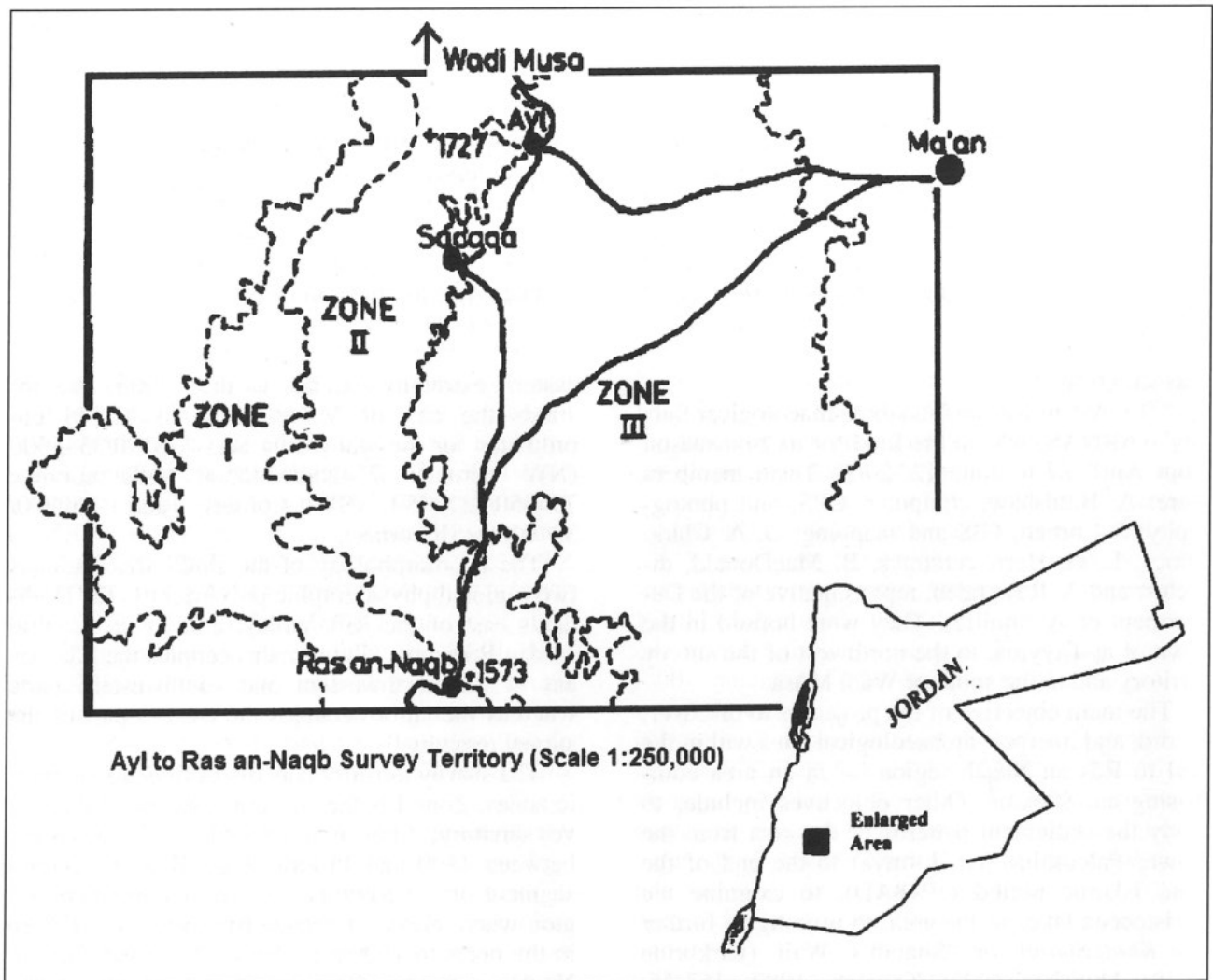
The geomorphology of the study area includes two regional physiographic provinces: 1) the Highlands east of the Rift Valley; and 2) the Central Jordan Pediplain. The former occupies the hilly areas in the northwestern and southwestern parts whereas the latter occupies the eastern part of the survey territory.

The survey territory consists of three topographic zones: Zone I is the western segment of the survey territory; it lies in an area where elevations are between 1500 and 1100m; Zone II is the central segment of the territory, i.e., the mountainous region where elevations range from just over 1700m in the north to 1500m in the south around Rās an-Naqab; and Zone III is the area from the 1500m line on the east towards the 1200m line, i.e., toward Ma‘ān (**Fig. 1**).

Zone I is cut by a number of wadis flowing to the west and southwest. It is an area in which there are a number of springs. The vegetation in this zone is Mediterranean. The zone comprises the western extremity of the Highlands east of the Rift Valley, i.e., the Wādi ‘Araba-Dead Sea-Jordan Depression (Bender 1974; 1975). Present-day climate in this zone, as in Zone III, is arid with annual precipitation as low as 50 millimetres.

Zone II is the location of the main N-S highway. It is the area of highest precipitation and the location of farming villages. The watershed is located in this zone and from it wadis lead to both Zones I and III. This geographical unit is frequently referred to as the Mountain Ridge and Northern Highlands east of the Rift (Bender 1975) and the Transjordanian Plateau (MacDonald 2000: 26-27). Here, Mediterranean climate dominates and annual precipitation is around 300 millimetres.

Zone III is the area between the “sown” and the



Ayl to Ras an-Naqb Survey Territory (Scale 1:250,000)

1. Location of ARNAS territory within Jordan and Topographical Zones of the Survey area.

“desert” (‘Amr and al-Momani 2001: 275). It is the steppe on which pastoralists and desert dwellers would encroach in times of drought. This geographical unit is at the western extremity of the Central Jordan Pediplain or Central Desert Area of Jordan (Bender 1974; MacDonald 2000: 25). The climate in this zone is arid and the vegetation is Irano-Turanian (MacDonald 2000: 36-38, esp. fig. 6).

Archaeological Context

Although the survey territory has been investigated for the past 100 years, a comprehensive and systematic survey of it has never been undertaken.

As part of his “Explorations in Eastern Palestine”, Glueck visited the ARNAS territory in both 1934 (1935) and 1937 (1939). Although he was confident that “not very many ancient sites in Edom ..., whose ruins have not been completely obliterated, remain undiscovered” (Glueck 1939:

xxiii), subsequent work in the area has found that this is not the case.

Jobling, in his “‘Aqaba-Ma‘an Archaeological and Epigraphic Survey”, investigated an area of around 2,700km² to the east and south of both Ayl and Rās an-Naqab during eight infield seasons between 1980 and 1988 (1981, 1982, 1983a-c, 1984a-b, 1985, 1986, 1989). In his work, he emphasized the region to the south of Rās an-Naqab, published preliminary reports at the end of most seasons, but died (in 1994) before he could produce a comprehensive, final report on his work.

Hart carried out “The Edom Survey Project” in a vast area from at-Ṭafila in the north to Rās an-Naqab in the south in 1984 and 1985. In the course of his work, he surveyed 115 sites (Hart and Falkner 1985; Hart 1986a-b). However, he did not survey the area between ash-Shawbak and aṣ-Ṣadaqa (1987b: 287), since it was covered by a British team working at Udhrūḥ, to the east of Petra, be-

tween 1980 and 1985 (Killick 1982, 1983a-b, 1989).

During his second season of survey work, Hart carried out five soundings at sites he surveyed (1987a-b) and excavated one site, namely, Ghurayra, in 1986 (1988). A summary of his work is contained in his Ph.D. dissertation (1989) and a report on the Iron Age findings of his work in a symposium on "The Beginning of the Iron Age in Southern Jordan" (1992). Hart's work was in the nature of "mostly purposive vehicular transects" (Hart 1987b: 287), "flints were not collected, the survey concentrating on ceramic materials only" (Hart and Falkner 1985: 255), and "it should be noted that evidence for temporary and transient occupation (such as camp sites) was not usually retrieved" (Hart 1986a: 337).

More recently, in the fall of 2003, Abudanh, a Ph.D. student at the University of Newcastle, U.K., carried out a one-month survey as part of his investigation of "the settlement pattern and military arrangement in the region of Udhrūḥ during the Roman and Byzantine periods" (Abudanh 2004: 51).

Because of the fact that the Roman Road or *Via Nova Traiana* (built 111-114AD to link Bostra in southern Syria to the Gulf of al-'Aqaba) cuts through the area, a number of researchers have been interested in the Roman remains in the area. At the very end of the 19th century, Brünnow and von Domaszewski (1904) investigated this road and Thomsen (1917) studied the milestones along it. In addition, such researchers as Graf (1979, 1983, 1995a-b), Parker (1986), and Fiema (1995) have investigated aspects of both the road and the various watchtowers and fortresses associated with it.

Although touching only on the most northern extremity of the proposed-survey territory, recent work, relative to "The Wadi Musa Water Supply and Wastewater Project" by 'Amr *et al.*, has thrown important light on the archaeological remains immediately to the north of the proposed-survey territory ('Amr *et al.* 1996, 1997, 1998, 2000; 'Amr and al-Momani 2001). In 'Amr *et al.*'s words, "one outstanding result of the archaeological survey is the large number of flint sites discovered" ('Amr *et al.* 1998: 504). The work has pointed out that at the extreme eastern point of their work, that is, at the northeastern extremity of the proposed-survey territory, "there is a clear difference in the landscape and nature of the archaeological remains. It is the point at which the 'sown' meets the 'desert'" ('Amr and al-Momani 2001: 275).

Finally, Saidel (2001) carried out "The Bedouin Ethnoarchaeological Survey Project" in the Ma'ān and Rās an-Naqab areas in 1998. His work entailed the investigation of abandoned Bedouin encampments with a focus on the identification and layout of tent camps.

In addition to the excavations and soundings that Hart carried out in the survey territory, the Department of Antiquities, as part of archaeological rescue work in conjunction with a road alignment of the Rās an-Naqab to al-'Aqaba highway, conducted a survey in 1992 of a number of sites in the Rās an-Naqab region (Bisheh *et al.* 1993) and followed this up in 1995 with the excavation of four sites that are located in the survey territory (Waheeb 1996). These sites, which are included in the present project's 2005 list of sites for purposes of comprehensiveness, are: Abū an-Nusūr (ARNAS Site 132); Khirbat al-Ḥayyād (ARNAS Site 133); 'Ayn al-Jammām North (ARNAS Site 183); and 'Ayn al-Jammām South (ARNAS Site 184) (Waheeb 1996). In addition, the Department of Antiquities' reports on their work both in 1992 and 1995 comment on a number of other sites that are or will eventually be part of the ARNAS's list of sites (Bisheh *et al.* 1993; Waheeb 1996).

Methodology

Various methodologies to fulfill the objectives of the project will be employed over the course of the infield work. However, this season, ARNAS team members employed, for the most part, a comprehensive and systematic examination of the greater part of topographical Zone II, that is, the central segment or the mountainous region of the survey territory (Fig. 1). A major roadway runs north-south through this region and many other roadways, mostly in the form of farming roads, run east and west from it. These secondary roads follow the ridges between the wadis and/or follow the wadis themselves. Since the watershed, as indicated previously, is located here and the terrain slopes, the wadis flow to the southwest and southeast.

ARNAS team members systematically investigated these wadis and their associated ridges for evidence of past — up to 1918AD-human activity. As a result, we invariably found most of our 209 sites in this manner (Table 1 — List of Sites). These sites consist of agricultural towns/villages/hamlets, farmsteads, forts, seasonal camps, roadways and their associated stations, and watchtowers (Table 2 — Types of Sites). Thus, the sites discovered in Zone II consist, for the most part, of architectural features (Figs. 2-5).

Table 1: List of ARNAS 2005 Season Sites.

Site#	UTM Coordinates	Site Name	Function*
001	743371/3344977	Kh. Ayl	Agricultural village
002	743159/3344413	-	Remnants of a watchtower/fort (?)
003	743180/3344871	-	Remnants of aqueduct and retaining walls(?)
004	742842/3344935	-	Caves/springs and possible aqueduct
005	741727/3342614	Kh. al-Fardhakh	Agricultural village
006	740957/3343273	Kh. Şabbāḥ(?)	Defensive (?)/agricultural village above Kh. al-Fardhakh
007	740151/3339231	Kh. aṣ-Şadaqa	Major town along the <i>Via Nova Triana</i>
008	741323/3339426	Rujum aṣ-Şadaqa	Watchtower
009	742940/3336557	Kh. Dūsīl	Agricultural village (at an oasis in Zone 3)
010	742446/3336406	-	Outbuilding (?) associated with Kh. Dūsīl
011	741868/3339996	Kh. Laykā	Agricultural village (?)
012	738821/3341063	-	Caves, retaining walls, and possible quarry
013	743141/3343157	Via Nova Traiana	Short segment of Roman road to the N of Kh. aṣ-Şadaqa
014	738981/3340078	Kh. Abū Naqāṭ	Agricultural village
015	739650/3339647	-	Standing stones and possible quarry
016	738528/3338403	Kh. Umm Na‘as	Agricultural village
017	739359/3338222	-	Watchtower (?)
018	739982/3338643	-	Watchtower (?)
019	737828/3338922	Kh. al-Maghidha	Agricultural village/hamlet
020	737540/3339946	-	Watchtower
021	737223/3339455	-	Agricultural village
022	736871/3338648	-	Watchtower and/or tomb
023	736503/3339127	Kh. Juwayza East	Fortress (?)
024	736218/3339768	Rujum ‘Utayq	Watchtower
025	735980/3341097	Kh. Bīr Yābis	Agricultural village
026	736609/3339007	-	Reservoir and water channel next to a segment of the <i>Via Nova Triana</i>
027	735851/3339605	Kh. Juwayza West	Agricultural town or village
028	735682/3338810	Rujum an-Nisā’	Agricultural village
029	735180/3340445	-	Agricultural village
030	735174/3339374	Hulayil	Farmstead or agricultural hamlet (?)
031	735194/3338569	Kh. Munay‘a	Agricultural village and/or defensive site at highway junction
032	734610/3339729	-	Farmstead - seasonal (?)
033	734204/3339950	Kh. ar-Rafāy‘a	Agricultural and/or “temple” site
034	733790/3339859	Kh. Mulayḥ	Agricultural village
035	733467/3340582	Rujum Zīf	Defensive – probably a fortress or watchtower overlooking Wādi ‘Araba
036	737806/3345021	Kh. Ḥubays	Agricultural village
037	735159/3343138	Kh. Umm Ḥaṣā	Farmstead
038	735834/3343243	Kh. adh-Dharwa	Agricultural village/hamlet
039	735685/3341865	Kh. ar-Rakham	Fortress – small – and/or watchtower
040	733624/3341563	Qaṣr Rājīf	Agricultural village
041	737509/3343778	-	Road-station and/or watchtower along Roman (?) road between Petra and al-‘Aqaba
042	737388/3343665	-	Fort – small – along Roman (?) road
043	740509/3345285	Kh. al-Jadwil	Farmstead or agricultural hamlet
044	739861/3344753	-	Farmstead – seasonal (?)
045	739706/3344597	Rās ‘Urayta	Probably a fort and/or agricultural village
046	738612/3344678	-	Agricultural village
047	738329/3344266	Tīlāl ‘Usūd W.	Administrative (?) complex
048	738262/3343776	Tīlāl ‘Usūd E.	Farmstead
049	739593/3342464	Janb al-Baḥar	Agricultural village and/or monitoring site

Site#	UTM Coordinates	Site Name	Function
050	747182/3341964	Khayt Shabib	Boundary wall (?)
051	740315/3341881	Kh. ar-Ruwayḥi	Agricultural village or hamlet
052	732678/3333815	Kh. Burq'	Agricultural village
053	732715/3334724	-	Agricultural village
054	732568/3337476	-	Fort –small – and/or watchtower
055	732853/3337699	Kh. Rusays	Fort (?) and/or village site (?)
056	737436/3336666	-	Farm
057	736928/3337005	-	Farm
058	736540/3337959	Kh. at-Ṭaqṭaqiyya	Agricultural village or hamlet
059	736237/3337442	-	Farm – probably seasonal
060	737162/3336565	-	Road
061	737284/3336131	-	Administrative area (?)
062	737362/3335659	-	Farm (?)
063	738240/3334808	-	Farm and/or spring site
064	738902/3335128	Bayt Abū Tāyih/Kh.	ad-Dūr East Major agricultural village
065	739944/3335708	-	Agricultural hamlet
066	738702/3335220	-	Agricultural complex
067	737074/3335127	Rujum Wadi Falāḥ	Watchtower (?)
068	737368/3334301	Kh. Khaṣkhaṣ	Agricultural village
069	736643/3335998	Kh. al-Ḥuḍun	Agricultural village
070	736411/3336454	-	Agricultural village
071	741402/3341776	-	Fort (?)
072	741789/3341231	-	Barracks (?)
073	736483/3334182	Kh. ad-Dūr West	Fort (?)
074	736165/3334077	Kh. al-Manṣūra East	Agricultural hamlet
075	735732/3333865	Kh. al-Manṣūra West	Agricultural village
076	735183/3334152	Kh. Umm Samqa	Agricultural village
077	735032/3334938	-	Agricultural village
078	735300/3334771	-	Agricultural village
079	738349/3334680	Kh. Umm Rās	Agricultural village and guard (?) of 'Ayn ad-Dūr
080	737766/3334149	Kh. Umm Ḥaṣā	Watchtower
081	735040/3335321	Kh. al-Bayyādāt	Agricultural village
082	734638/3334989	-	Way-station (?) along Roman and Turkish roads
083	734627/3335010	Darb ar-Raṣif	Remnant of Turkish and Roman roads
084	735297/3336148	-	Agricultural village
085	734935/3335804	-	Agricultural hamlet (?)
086	735646/3337259	Kh. Umm Kahmūma	Agricultural village
087	734711/3337890	Kh. Abū Rumān	Agricultural village
088	734117/3334554	-	Cemetery (?)
089	733826/3334039	Kh. Khilāl	Agricultural village or hamlet
090	733764/3335002	-	Agricultural village
091	734606/3338661	Rās al-Banāt	Tomb and/or watchtower
092	734045/3339154	-	Farmstead (?)
093	737884/3335696	-	Farm (?)
094	737395/3335635	-	Seasonal, agricultural camp (?)
095	735867/33373319	-	Agricultural hamlet
096	735448/3338126	-	Agricultural village
097	735550/3336708	Kh. Umm Zaytūna	Agricultural village
098	734762/3340893	-	Farming area
099	738339/3332496	-	Roman milestone – fragment
100	738310/3332504	-	Agricultural village or hamlet
101	737128/3333102	Kh. 'Uqla	Agricultural village or hamlet
102	737139/3333276	-	Tomb (?)
103	736721/3333706	Kh. Khaṣkhaṣ	Camp – seasonal (?)
104	736069/3332906	-	Farmstead (?) – seasonal (?)

Site#	UTM Coordinates	Site Name	Function
105	735844/3333210	-	Farmstead – seasonal (?)
106	735190/3333179	-	Farmstead (?) or watchtower (?)
107	734792/3332993	-	Farmstead
108	737157/3331702	Kh. Ḥamdān	Agricultural village
109	737486/3331678	-	Farm (?)
110	738037/3331984	Kh. Qurayn	Agricultural village
111	738520/3331086	Kh. Suwayma	Agricultural village
112	737995/3330285	-	Farm – seasonal (?)
113	736979/3328830	-	Watchtower
114	736516/3329614	Kh. ‘Iyāl ‘Ali	Agricultural village
115	736007/3327766	Rujum al-Ishāra	Fort
116	735925/3328098	Bir Turki	Well
117	735896/3328295	Kh. Bir Turki	Agricultural village
118	734710/3332995	-	Watchtower
119	735146/3332837	Kh. al-Mayz	Agricultural village
120	735298/3332986	-	Agricultural village or hamlet
121	736379/3331983	Kh. Umm Rujūm	Agricultural village
122	736235/3332523	-	Cistern
123	736590/3332907	-	Agricultural hamlet
124	735329/3329879	Kh. Umm Baradiya North	Agricultural village
125	735597/3329727	Kh. Umm Baradiyya South	Agricultural village
126	735881/3330783	Rujum ‘Iyāl Ghānim	Agricultural village
127	735110/3331065	Rujum ar-Raṣīf	Agricultural village
128	746907/3316896	Kh. al-Khūr	Agricultural village
129	745058/3319950	Kh. Al-Qurna	Fortress
130	744770/3319856	-	Farm (?)
131	741759/3321078	Kh. Shadīd=Shdayd	Fortress
132	738746/3322707	Kh. Abū an-Nusūr	Watchtower; agricultural village/hamlet (?)
133	739373/3326697	Kh. al-Ḥayyid	Agricultural village/hamlet
134	734528/3332813	-	Reservoir along major roadway
135	734172/3332445	-	4 enclosures - seasonal farm and/or camp (?)
136	733270/3332076	-	Agricultural village or hamlet
137	732974/3332279	-	Tomb and enclosures
138	732810/3331937	-	Farmstead and/or road-station (?)
139	732891/3331691	-	Road-station (?)
140	732869/3333187	-	Millstone (for olive press [?])
141	732623/3333169	Kh. Juwaybil	Agricultural village
142	732973/3333197	-	Watermill (?)
143	732828/3332978	‘Ayn Juwaybil	Sherd scatter at spring and reservoirs
144	733174/3332729	-	Farmstead
145	733348/3332619	-	Farmstead
146	733981/3333135	-	Farmstead
147	738659/3339805	-	Agricultural village
148	738199/3340022	-	Agricultural village/hamlet
149	737804/3340558	-	Farm outbuilding (?)
150	737415/3340674	-	Agricultural village
151	737081/3341153	-	Farm – seasonal camp (?)
152	736975/3341025	-	Agricultural hamlet
153	737303/3342855	-	Farm – seasonal (?)
154	737582/3343303	-	Watchtower
155	738113/3341730	-	Agricultural village
156	737948/3341526	-	Watchtower and/or farm (?)
157	737721/3341634	-	Storage area (?) and corral
158	738906/3341729	-	Agricultural village
159	735266/3332016	-	Agricultural village

Site#	UTM Coordinates	Site Name	Function
160	735705/3331510	Kh. Umm Ghānim North	Agricultural village/hamlet
161	735868/3331302	Kh. Umm Ghānim South	Agricultural village
162	743675/3343089	‘Ayn al-Ḥayṣ	Lithic scatter
163	744376/3342696	-	Lithic scatter
164	753018/3342345	-	Lithic scatter
165	751034/3342442	-	Enclosure - seasonal camp (?)
166	750481/3344448	Rujum al-Juththa	Fort
167	742826/3342061	-	Lithic scatter (transect)
168	743344/3341301	-	Lithic and sherd scatters
169	744043/3341221	Lake al-Fardhakh	Lithic and sherd scatters (transect)
170	744585/3341246	-	Lithic scatter
171	748909/3339389	Lake ad-Dirbāsi	Lithic scatter (transect)
172	748532/3339976	-	Military camp (?)
173	753312/3342744	Lake Abūal-Adham	Lithic scatter (transect)
174	753225/3343136	-	Farmstead – seasonal (?)
175	759464/3343958	-	Lithic scatter in Lake #4 (transect)
176	757385/3344268	-	Lithic scatter in Lake #4 (transect)
177	752247/3344227	-	Check dam and terracing within (?) Lake #5
178	752399/3344446	-	Lithic scatter in Lake #5 (transect)
179	755091/3345599	-	Lithic scatter in Lake #5 (transect)
180	750172/3345245	Jabal al-Juththa Quarry	Lithic scatter
181	750074/3345503	Lake al-Juththa	Lithic scatter (transect)
182	750778/3320362	Lake al-Baṣṭa	Lithic scatter (transect)
183	738061/3323602	‘Ayn Jammām North	Neolithic agricultural village
184	738120/3323473	‘Ayn Jammām Sout	Watchtower
185	742411/3344738	-	Enclosures - farmstead or seasonal camp (?)
186	741581/3344546	-	Agricultural hamlet or farmstead
187	741899/3344560	-	Farmstead (?)
188	741246/3345078	-	Watchtower
189	741321/3345810	Kh. ‘Ayn Hasin	Agricultural village
190	740740/3345433	Kh. aṭ-Tūliyya	Agricultural village
191	740064/3344760	Kh. ‘Urayta	Agricultural village
192	740618/3344569	-	Fort
193	750118/3340011	Kh. al-Wahīda	Defensive (?) structure
194	749858/3340100	Lake al-Wahīda	Lithic and sherd scatters
195	753324/3339937	Kh. Wahdān	Function unknown
196	744271/3333832	al-Muraygha	Fort
197	742202/3324763	-	Watchtower
198	742297/3325408	-	Camp - enclosure
199	740495/3326622	Abū al-Lusun	Agricultural village
200	737512/3323626	Kh. ‘Ayn Ṣurra	Farmstead
201	735505/3329068	-	Agricultural hamlet or farmstead
202	735977/3329570	-	Farmstead
203	737754/3327684	Kh. Tāsān	Agricultural village
204	737789/3327246	Kh. Ṭuwaymira	Farm (?) or agricultural village (?)
205	737544/3326656	Kh. Judhām	Farmstead (?)
206	738593/3327260	Kh. Umm ath-Thība	Agricultural village
207	738373/3327448	-	Solitary building – house
208	732110/3335610	Kh. Dulāgha	Agricultural village
209	728361/3331852	-	Watchtower

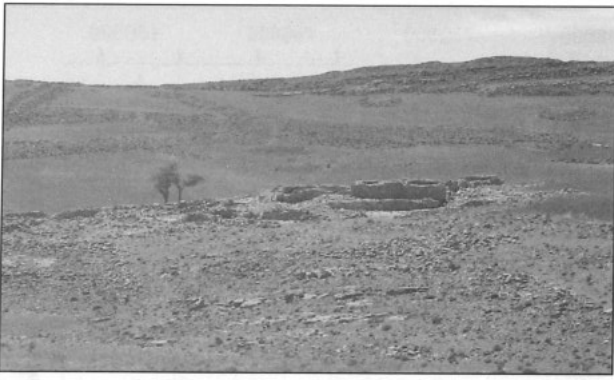
* Of course, the determination of “function” on the part of ARNAS team members must be tentative at this stage of investigation. Generally, it is only with the excavation of the site in question will it be possible to determine with greater certainty its function(s).

Table 2: Site Types of the ARNAS 2005 Season*

Administrative complex:	047 (?); 061;
Agricultural towns/villages/hamlets:	001;005; 006; 007; 009; 011 (?); 014; 016; 019; 021; 025; 027; 028; 029; 031; 033; 034; 036; 038; 040; 046; 049; 051; 052; 053; 055 (?); 058; 064; 065; 068; 069; 070; 074; 075; 076; 077; 078; 079; 081; 084; 085 (?); 086; 087; 089; 090; 095; 096; 097; 100; 101; 108; 110; 111; 114; 117; 119; 120; 121; 123; 124; 125 (Photo 1); 126; 127; 128; 132; 133; 136; 141; 147; 148; 150; 152; 155; 158; 159; 160; 161; 183; 184; 186; 189; 190; 191; 199; 201 (?); 203; 204 (?); 206; 208;
Aqueducts:	003; 004 (?);
Barrack:	072 (?);
Boundary wall:	050 (?);
Camp, seasonal:	094 (?); 103; 135; 151; 165; 172 (military) (?); 185 (?); 198;
Cave:	012;
Check dam:	177;
Cistern:	122;
Farmsteads:	010; 030 (Photo 2); 032; 037; 043; 044; 048; 056; 057; 059; 062 (?); 063; 066; 092 (?); 093 (?); 098; 104 (?); 105; 106 (?); 107; 109 (?); 112; 130 (?); 138; 144; 145; 146; 149; 153; 156 (?); 174; 187; 200; 201 (?); 202; 204 (?); 205 (?);
Forts:	002 (?); 023 (?); 035; 039; 042; 045; 054; 055 (?); 073 (?); 079 (?); 115; 129; 131; 166; 190; 193 (?); 196;
Function undetermined:	195;
House – solitary:	207;
Lithic scatter:	162; 163; 164; 167; 170; 171; 173; 175; 176; 178; 179; 180; 181; 182;
Lithic and sherd scatters:	168; 169; 194;
Milestone, fragment:	099 (Photo 3);
Millstone:	140;
Quarries:	012 (?); 015 (?);
Reservoirs:	026; 134; 143;
Roads:	013 (Via Nova Traiana); 060; 083 (Darb ar-Raḥṭf);
Road-stations:	041; 138 (?); 139 (?);
Standing stones:	015;
Storage area:	157 (?);
Temple:	033;
Tomb(s):	022; 088 (?); 091 (?); 102 (?); 137;
Watchtowers:	002 (?); 008; 017 (?); 018 (?); 020; 022; 024 (Photo 4); 041; 067 (?); 080; 082 (?); 091 (?); 106 (?); 113; 118; 132; 154; 156 (?); 184; 188; 197; 209;
Watermill:	142 (?);
Well:	116.

* The classification of these sites into their various functions is, of course, tentative since it is based on the observation of ARNAS team members or others who have previously visited them. A more definite determination of a site's function can be obtained by further investigation, especially by means of excavation.

Some sites have been tentatively determined to have more than one function, for example, a watchtower and/or tomb, a watchtower and/or road-station.



2. Site 125, Kh. Umm Baradiyya South



3. Site 30 – Farmstead or hamlet



4. Site 99 – Roman Milestone Fragment



5. Site 24 – Watchtower.

In our work at each site, we made an effort, especially with the help of our departmental representative, to obtain its name. And the spelling of these names follows the practice of the Department of Antiquities in its publications, specifically ADAJ and SHAJ (see, for example, Nabeel and Zaghoul 1988; Nabeel and al-Taher 2003).

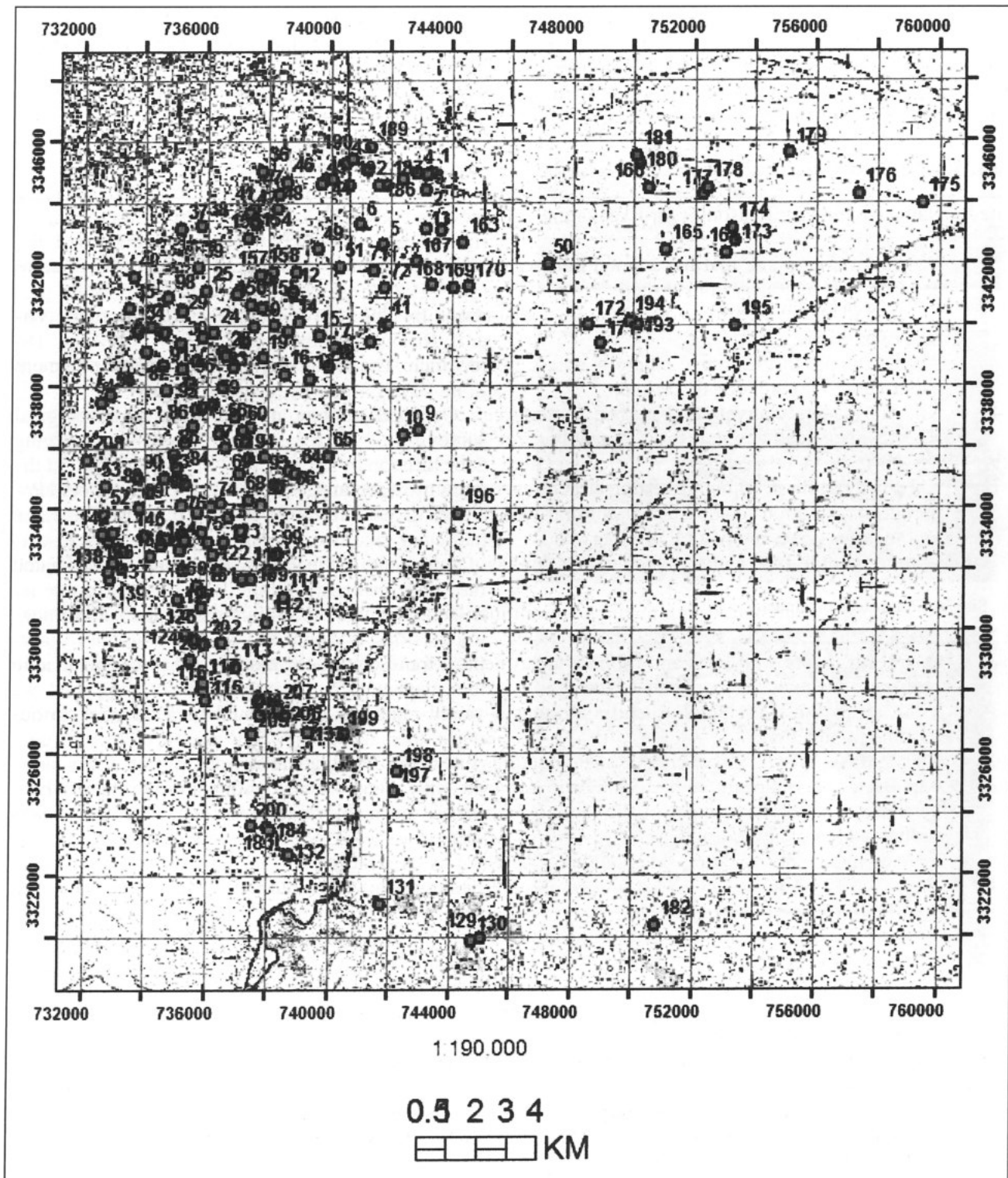
We also examined the Pleistocene lakes that are indicated on the “Geological Map of Ma’an (3150-III)” (Scale 1:50,000) (Tarawneh 2004) and the “Geological Map of Jabal al Batra (Jibal Thlaja) (3149-IV)” (Scale 1:50,000) (Moumani 2002) produced by The Hashemite Kingdom of Jordan, Natural Resources Authority (NRA), Geology Directorate. These maps indicate Pleistocene lakes in Zone III of the survey territory (**Fig. 6**)

Our methodology, relative to the archaeological surveying of these lakes, consisted of identifying their location by means of UTM coordinates that the maps provided and then, with the aid of a Global Positioning System (GPS), driving to them. Once at a particular lake, we carried out pedestrian transects of segments of the lakes and collected associated materials, primarily lithics. These transects are labeled “sites” for the sake of this project. Our thinking was that it would be just as beneficial to label these transects and the materials that we collected in this manner as “sites.” We did not think that we would obtain more information about the periods when the lakes were “active” by collecting concentrations of lithics at various places either along the lakes’ shores and/or within the lakes themselves. Where possible, we assigned names to these lakes on the basis of associated geological features.

As a result of the above-described methodologies for discovering and recording sites, our map indicates that the 209 sites of the 2005 season are concentrated in Zones II and III (**Fig. 6**). Of course, there are other sites indicated. These sites were surveyed as we carried out the indicated methodologies.

Finally, we did pay attention to sites that previous investigators had documented in the survey territory. However, we did not deem it necessary in our first season of work to be thorough relative to these sites since we have infield seasons planned for 2006 and 2007.

Once a site was “discovered”, a sheet, describing it, was initially filled out in the field and all materials collected were labeled as to their provenance. Moreover, photographs were taken of what team members considered to be the site’s most important features. At base camp, site sheets were updated, entries were made to the project’s database on each site, the location of each site was plotted,



6. Location of the Sites of the ARNAS 2005 Season.

with the aid of co-ordinates obtain by the GPS in the field, on maps using an ArcGIS database, and preliminary cultural-temporal units were assigned to the lithics and sherds collected. Following the in-field season, further research is being done on the cultural remains of the survey territory; se-

lected sherds and lithics, with the permission of the Department of Antiquities, were shipped to Canada for further analyses, e.g., sawing, drawing, colour coding, and the preparation of plates for publication purposes; and work on preliminary reports and eventually a final report are underway.

Another action we took this year involved the team's decision to publish a list of sites that we considered as good candidates for excavation (Table 3). By this, we hope to bring particular attention to these sites so that they may be further in-

vestigated by others before more damage, e.g., by means of field clearance, other agricultural activity, road and house construction, quarrying, the erection of telecommunication towers, and/or erosion, is done to them.

Table 3: ARNAS 2005 Season Sites that are good Candidates for Excavation.

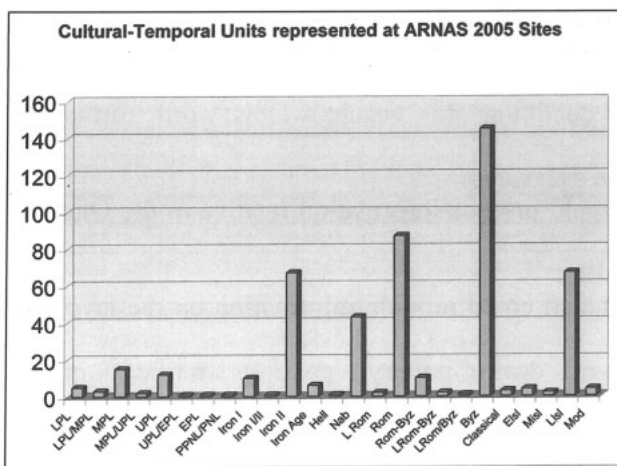
Site #	Name (if known); Reason(s) for Excavation
6	-; A large hilltop site that has a good number of surface remains; it is possible to discern structure patterns; it is relatively undisturbed;
7	Kh. aṣ-Ṣadaqa; in selective zones that are undisturbed; possibility of encroachment due to future village expansion;
9	Kh. Dūsīl; out in the steppe where it is rare to find such sites; relatively undisturbed; a settlement pattern could possibly be discerned;
14	Kh. Abū Naqāṭ; relatively undisturbed; patterns can be detected; potential for good deposition;
23	Kh. Juwayza East; an interesting, probably fortress site;
25	Kh. Bir Yābis; an interesting agricultural site high in the hills;
27	Kh. Juwayza West; some interesting structures, especially at the top of the site that could provide important information relative to agricultural village sites; it would be interesting to learn if the relief on the large stones are natural or otherwise;
33	-; an agricultural (?) and/or "temple" site; this is a unique site (if indeed it is a sacred site of some kind);
36	Kh. Ḥubays; many interesting features present including paving stones in almost all the various segments of the site;
40	Qaṣr Rājif; many wall lines and room/compartments are present; excavation would probably be able to discern the major components of the site;
47	Tilāl 'Usūd West; a single structure site that is pretty much intact; it would be interesting to determine its function;
49	Janb al-Baḥar; this extensive site has many features that could be elucidated by excavation;
52	Kh. Burq'; this appears to be a domestic complex with many rooms/buildings quite clear; an investigation of the S segment of the site could provide much information on the layout of what is probably an agricultural village;
61	-; many intriguing structures that could be elucidated by excavation;
64	Bayt Abū Tāyih/Kh. ad-Dūr East; a great deal of in situ material and buildings - the nature of which could be explained by excavation;
70	-; an agricultural-village site that could reveal a great deal because of the number of footprints of structures still present;
72	-; barracks (?); outline of the site ought to be readily attainable by excavation;
75	- Kh. al-Manṣūra West; one of the most impressive sites that we have visited; many features could be elucidated by excavation;
80	Kh. Umm Ḥaṣā; because of its relatively intact condition, this watchtower is worth further investigation;
88	-; if this is indeed an Iron II cemetery, it ought to be excavated;
110	Kh. Qurayn; a great deal of in situ material that could provide information relative to the Ottoman and earlier periods;
111	Kh. Suwayma; same reasons as for previous Site 110;
115	Rujum al-Ishāra; a fort that is still pretty much intact; could provide information on the layout of such a structure for the period(s) represented;
116	Bir Turki; the bulldozer cut shows that there is a great deal of pottery - possibly stratified - in segments of the site;
117	Kh. Bir Turki; much interesting subsurface material; excavations could reveal village patterns and the function(s) of various site features;
119	Kh. al-Mayz; although partially bulldozed, the remainder of the site is impressive; its walls can b

Site # Name (if known); Reason(s) for Excavation

- clearly traced and there appears to be deposition;
- 121 Kh. Umm Rujūm; a very impressive site with massive walls and possible a robbed tomb that has 1 m long stones; the cistern is large and ought to be investigated further;
- 129 Kh. Al-Qurna; an impressive site that has been disturbed somewhat; however, there is much to be learned from excavation about a fortress from this period;
- 131 Kh. Shadīd=Shdayd; another impressive defensive site; there is much that could be learned from its excavation;
- 154 -; a watchtower that is impressive and that could reveal information about such structures if excavated;
- 158 -; appears to be a great deal of deposition; could yield information on an agricultural village for the period(s) represented;
- 161 Kh. Ghānim South; many rectilinear structures intact; and there appears to be a great deal of deposition, at least in some areas; could yield information on an agricultural village for the period(s) represented;
- 166 Rujum al-Juththa; this fortress ought to be excavated since it is in danger of being completely destroyed due to quarrying in its immediate vicinity;
- 168 -; a fossil spring from which MPL artifacts in pristine condition were collected; thus, further investigation may be warranted since faunal remains may be preserved; it is also possible that the spring sediments (tufo) can be dated since the artifacts appear to be pure and homogeneous;
- 175 -; there may be some integrity to the latest phase of deposition, i.e., the Epipaleolithic;
- 188 -; this watchtower has good preservation; it could provide information relative to its make-up and determine its age more precisely;
- 192 -; this fort has good preservation; robber trenches show ca. 2m of deposition; thus, it would be worthwhile to excavate it to determine its layout and precise age;
- 194 Lake al-Wahida; vegetation suggests a small spring or seep in the area, and the fresh condition of the artifacts suggests the potential for excavation;
- 196 Al-Muraygha; an impressive fort site, that although disturbed, probably has a great deal of in situ material present;
- 199 Abū al-Lusun; another impressive site that probably has a great deal of in situ material present;
- 206 Kh. Umm ath-Thiba; many rooms cleared of rubble; excavations ought to result in the obtaining of a good plan of an agricultural village.

Cultural-Temporal Units Represented

Figure 7 indicates the cultural-temporal units represented at the sites of the 2005 season. It in-



7. Cultural-Temporal Units represented at the Sites of the ARNAS 2005 Season

dicates clearly that for the Paleolithic period Middle Paleolithic artifacts are most frequently encountered while for the historical periods sherds attributed to the Iron II, Nabataean, Roman, Byzantine, and Late Islamic are best represented.

Some of the pottery readings need to be explained. “Iron Age” readings were sherds that were clearly from that period, but we could not determine whether they were Iron I or Iron II. “Nabataean” is pottery typical of the Late Hellenistic to Early Roman horizon at Petra. It is primarily Early Roman, but we cannot exclude the very end of the Hellenistic period. The “Roman” readings were probably Late Roman, but may include some Early Roman sherds, as well. They could also include sherds that seem to span most of the Roman period “Rom-Byz”, “L Rom-Byz” and “L Rom/Byz” are similar calls, the first two reflecting a time span and the last indicating a transitional horizon.

Relative to periods poorly represented or not at all represented in the 2005-collected materials, the only Neolithic materials came from one site, that is, ARNAS Site 183 ('Ayn Jammām North), that the Department of Antiquities excavated in 1995. We identified no Chalcolithic, Early Bronze, or Middle Bronze period materials and only one possible Late Bronze sherd. Persian period material was not identified but it could very well be that some of the ceramic materials that we are calling Iron II continue into the Persian period. Finally, both the Early and Middle Islamic units are poorly represented in the ARNAS-2005 collected materials.

What the above points out is that there are long periods of time when the archaeological evidence does not support any sustained human presence in the area. In addition, there are periods when there appears to be little in the way of settlement in the territory.

Levantine Paleolithic Landscape Chronology

Except where disturbed by modern construction, or buried by Holocene sediments, all of Jordan is covered with a thin veneer of Paleolithic artifacts reflecting more than a million years of human use of environments that were grassland savannas over much of the Pleistocene. Although heavily deflated Lower and Middle Pleistocene land surfaces are exposed in patches throughout the country, and are exceptionally well-preserved in the Jafr Basin (Rollefson *et al.* 2005; Wilke *et al.* 2005; Quintero *et al.* 2004, 2005), most recognizable paleolandscape geomorphology dates to the Upper Pleistocene (130-12kya). Dotted with shallow, weakly alkaline lakes ringed by freshwater springs, often with swamps and marshes around their margins, these landscapes attracted human settlement throughout prehistory. Ancient lakeshores are littered with evidence of a human presence, as foragers were drawn to these micro-environments by the availability of fresh water, and by dense concentrations of the gregarious ungulates upon which they preyed (Olszewski and Coinman 1998; Schuldenrein and Clark 2003).

The best known and most enduring of these lake basin environments was the Samra/Lisan lake succession in the Jordan Rift Valley (e.g., Yechieli *et al.* 1993). Extensive lake beds have also been identified in the Jafr Depression (Huckriede and Wieseman 1968), while the Azraq Basin sustained paludal swamps and marshes after about 45kya, during the early Upper Paleolithic (Garrard *et al.* 1994). Henry also reports 'remnant Pleistocene lakes' in the Wādī Ḥismā, along the southern edge

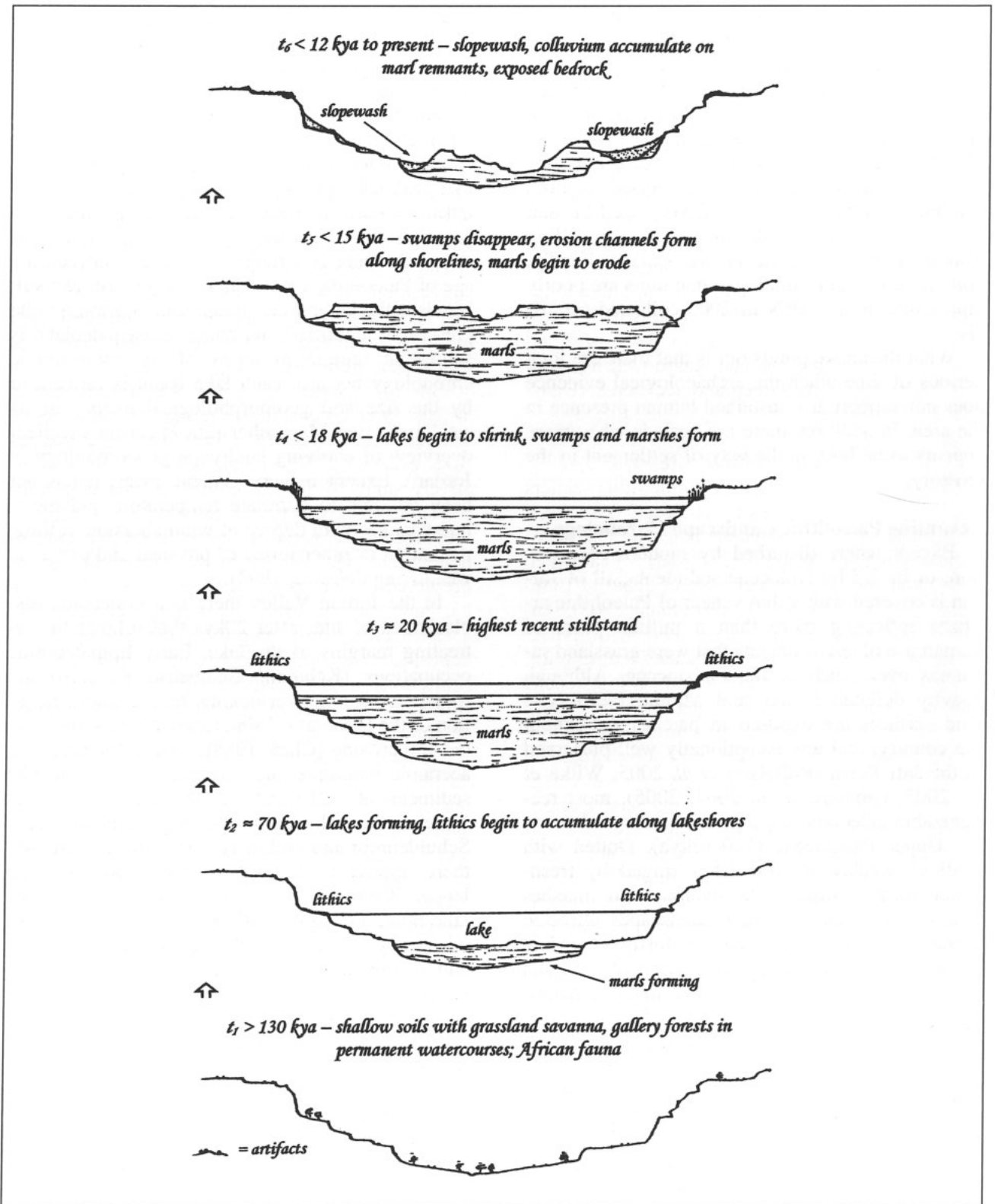
of the Jordan Plateau (1995: 38, 39). Most recently, the chronology of Pleistocene Lake Hasa has been reconstructed (Schuldenrein and Clark 1994, 2001, 2003; Schuldenrein 1998).

The Hasa and Lisan models suggest that limnic environments generally developed under cooling climatic conditions beginning ca. 70-60kya, and that peak lake levels post-date ca. 25kya. After ca. 20kya, shorelines began to retreat, and these regressions were tracked by human groups. Consequently there is a rough correlation between the age of Paleolithic flint scatters and that of lake still stands if the latter were of sufficient duration to be preserved, identified and dated. Each paleolake is somewhat unique in terms of its fluvio-limnic chronology because each lake basin is influenced by the size and geomorphological history of its catchment (see Macumber [2001] for an excellent overview of evolving landscape geochronology in Jordan). Except in very general terms, it has not been possible to correlate temperature and moisture changes with degree of wind abrasion, rolling, patination or other forms of physical and chemical weathering (Walwer 1993).

In the Jordan Valley there is a systematic displacement of sites after 20kya that follows the retreating margins of the lake. Early Epipaleolithic occupations (Kebaran, Geometric Kebaran) are found on terraces overlooking the maximum elevation of the Lisān at -180m (arguably at -160m on the Jordan side [Clark 1988]), while Natufian and aceramic Neolithic sites are preserved in paludal sediments at -210 and -230m respectively (Bar-Yosef 1987; Hovers 1989; Schuldenrein 1983; Schuldenrein and Goldberg 1981). In the al-Ḥasā, there appear to be direct correlations between Upper Paleolithic Ahmarian occupations and the lakeshore, and Epipaleolithic habitation along paludal margins and in rockshelters above the wadi and its tributaries (Coinman 1993; Olszewski and Coinman 1998; Schuldenrein and Clark 1994). A schematic view of changing lake-basin environments in relation to artifact scatters is given in **Figure 8**.

Recent Refinements at Soreq Cave

Work at Soreq Cave, in the west Judean highlands south of Jerusalem, analyzes the stable oxygen ($\delta^{18}\text{O}$) and carbon ($\delta^{13}\text{C}$) profiles of speleothem calcite as a proxy for paleoclimatic variation in temperature and moisture regimen (Bar-Matthews and Ayalon 2003: 13-18). The research offers a higher resolution picture of last glacial Levantine paleoclimates than had previously been available. It corroborates the long-term cool-



8. A generalized sequence from 130-12 kya showing the evolution of Upper Pleistocene lacustrine geomorphology in relation to paleolithic archaeological sites (based on the Wadi al-Hasa sequence [Schuldenrein and Clark 1994, 2001, 2003]). Lower and Middle Paleolithic artifacts are wind-abraded, sometimes rolled and patinated, and are found on deflated remnants of the pre-130 kya land surface, often in flint *hammada*(s) (desert pavements). Middle Paleolithic artifacts are usually polished and wind-abraded, less frequently rolled; fresh pieces are confined to rockshelters, and to tufas, calcites and other spring deposits. Upper and Epi-paleolithic artifacts are relatively fresh, although often wind-polished. All open-air paleolithic sites tend to be concentrated along former lakeshores, frequently near fossil springs.

ing trend just noted (OIS 5-2) during which temperatures declined from ca. 17° C (at ca. 60kya, early OIS 3) to ca. 10° C (ca. 19kya, last glacial maximum [OIS 2]), rose sharply after ca. 18kya (reaching present day highs by ca. 16kya), dropped again during the local equivalent of the Younger Dryas (13.5-11kya), and then rapidly rebounded to modern levels by ca. 10kya. Over the same interval, mean annual rainfall increased from ca. 200mm to ca. 550mm, albeit beset by marked fluctuations. The warmest and wettest intervals were from 54-52kya, and at ca. 36kya. These long-term trends were punctuated by short (0.5-2kya), abrupt, very cold events at ca. 46, 35.5, 34.5 and 19kya that resemble the Dansgaard-Oeschger cycles reported in the Greenland ice cores (Dansgaard *et al.* 1993).

Paleolithic and Epipaleolithic Sites

Table 4 summarizes the principle lithic scatters that survey-team members recorded associated with Pleistocene lake deposits noted on the “Geological Map of Ma’an (3150-III)” (Tarawneh 2004) and the “Geological Map of Jabal al Batrā (Jabal Thallāja (3149-IV)” (Moumani 2002). **Table 5** lists scatters not associated with NRA-reported lakes on the above-indicated maps. Without exception, the latter are found on Pleistocene alluvial deposits (gravels, conglomerates, etc.), colluvium and/or slopewash, although field observation often confirms the presence of remnant marls and calcites in the vicinity, probably registering small, ephemeral lakes that had escaped the notice of the NRA survey teams.

Of the 13 sites reported in **Table 4**, about half are palimpsests consisting of wind-abraded, polished, rolled, patinated and/or varnished artifacts only broadly assignable to a temporal phase. Seven sites merit further comment.

Site 168 consists of an artifact scatter associated with a fossil spring eroding out of two adjacent wadis near the southeast corner of Lake al-Fardhakh. The spring deposits contain Middle Paleolithic artifacts in pristine condition (i.e., although patinated, there are no signs of rolling, wind-abrasion, etc.), suggesting that further investigation might be warranted. Based on work at ‘Ayn al-Buḥayra (WHS 618) in Wādī al-Ḥasā, it is also possible that faunal remains are preserved in the extremely basic sedimentary matrix (Coinman 1993, 2000). A scatter of Iron Age and Byzantine pottery around the spring suggests later reactivation of the eye, and it is likely that the karstic system of which the spring was a part was activated and reactivated periodically over tens of

thousands of years. A tufa preserving organic remains is associated with the spring and could possibly be dated by the U-series method used by “The Wadi Hasa Paleolithic Project” to date similar deposits in Wādī al-‘Alī (Schuldenrein and Clark 1994).

Site 173 consists of a transect at the SE end of Pleistocene Lake Abū al-Adham, and is noteworthy for the unambiguous stratigraphy that constituted the basis for **Figure 8**. It is clear that Lower and Middle Paleolithic artifacts derived from the surrounding highlands accumulated along the former lakeshores as a consequence of slopewash, and are thus unrelated to the Upper Pleistocene lacustrine environments of interest here.

Site 175 consists of a 250 x 50m transect across at least three ostensible shorelines of Lake No. 4. We recovered over 100 lithics from all time periods except the Lower Paleolithic. There is a relatively small Middle Paleolithic component comprising at least one typical Levallois point. Most of the material recovered is Upper Paleolithic and Epipaleolithic, with lots of small blades and bladelets preserved on a remnant, deflated-land surface that has not been disturbed by modern construction. There may be some integrity to the latest phase of deposition, i.e., the Epipaleolithic, as there are concentrations of small blades and bladelets within the flint *ḥammada*. Survey-team members observed no ceramics.

Site 179 is another transect (100 x 400m) located on a southern embayment of Lake No. 5, and designed to cross-cut its eastern and western shores. Like Site 175, the scatter is mostly Upper and Epipaleolithic, with small flakes and blades, and at least one exhausted bladelet core. These artifacts are mostly of a uniformly high-quality brown flint, almost always wind-polished. There are occasional rolled Middle Paleolithic pieces. Some 200m west of the end of the transect, on the opposite site of the wadi and corresponding to the north shoreline of the lake, are a series of indurated marls associated with fossil springs and tufas that could be dated.

Site 180 (the Jabal Juththa Quarry Site) consists of an enormous scatter of lithics accumulated along the west side of the jabal, and extending out some 100m onto the adjacent marls of a small lakebed that formed in an embayment abutting the hill. Many of the artifacts are made from a fine-grained, homogeneous, high-quality chocolate brown flint that outcrops in bands 5-7m thick (in aggregate) extending across the top of the hill. These are visible on the western flank of Jabal Juththa, standing on the marls below. There are hundreds of thou-

Table 4: ARNAS 2005 Season Lithic Sites associated with NRA-Identified Lakes.

A. Non-Levallois Elements	168	169	170	171	173	175	176	178	179	180	181	182	194	Comments
1. Flakes:														
flake, 1DC	2	3	1		1	2	3	7	3			4		
flake, 2DC	3	8	10	3	3	13	19	7	4		4	15	8	
flake, plain	9	13	16	4	7	20	20	15	21	7	14	76	20	
flake, trim (<2cm)		1			1	10		2	8			1	2	
flake, natbk	1	2					3	1	2					
2. Blades:														
blade, undiff'd	4	16	14	11	4	19	16	7	10	32	22	49	12	
blade, natbk		1		2	3	4	5	2	1	6	1		2	
bladelet (<3cm)						18			4			11		
3. Miscellaneous:														
burin spall														
fk, core ren														
fk, platform tablet	1													
fk, core ren unsp				1					1				2	
B. Levallois Elements														
1. flakes				4		1				4		*15		3 textbook examples
2. points														
C. Cores														
1. Levallois														
flakes							1				1			
points											1		1	
2. Discoidal														
full								1		1	1			
partial							*3	*1			1		1	2 could be partial bifaces
3. Single Platform														
flake						1			2					
blade							2	1		1		*3		1 exhausted
bladelet (<3cm)									*1			3		1 exhausted
mixed								1			1		2	
4. Opposed-Multiple														
flake	3	2	1				2							
blade				2										
bladelet														
mixed		1												
5. Other (fragments)														
	1	3			1	4	1	1						
D. Shatter														
		1				12			7		2			
E. Retouched Pieces														
SS, convex on flk		1											1	
SS, straight on flk							1				1			
ES, on flk													1	
ES, on blade	1					1							3	
ES, on ret blade													2	
ES, keeled on bld													1	
ES, double on bld													*1	
BU, dihedral													1	
notch, on flk							1							
denticulate, on flk								1			1	1		
bld w/ obliq trunc													1	
CRB-1													1	
CRB-2									1					
biface, partial											1			
biface, complete	1	4		1										
ES/CRB-1/dentic													1	
pseudo lev pt, ret													1	
perforator, on flk														1
F. Total:	26	56	42	28	20	105	77	47	65	51	51	194	49	

sands of lithics in pristine condition scattered across the marls, dominated by large blades and cores. Four large Levallois points were also recovered, suggesting that most of the collection pertains to the Middle Paleolithic. No pieces clearly diagnostic of earlier or later periods were noted.

A 350 x 400 (N-S) m transect (Site 181) through the center of adjacent Lake Juththa recovered (mostly) Middle Paleolithic material that became more abraded and rolled as we moved north from the starting point below the west face of the *jabal*. Lithics decline in frequency from south-north, and then pick up again as we approached the north shore of the lake.

Site 182 is a transect through Lake al-Baṣṭa, a small lake that measures only 700 (N-S) x 300 (E-W) metres. Marls are exposed on the west shore of the lake and there is a possible collapsed rock shelter on the eastern shore. The slopes on both sides of the little valley yielded Paleolithic artifacts, most Upper Paleolithic on the northeast shore, Middle Paleolithic (including a number of typical, short, broad Tabun B-C type Levallois points, pseudo-points) on the west shore. At one point on the northeast shore, fresh pieces were observed eroding out of the marls that form a cornice at places along the eastern side of the valley. Survey-team members collected no obviously Lower Paleolithic or Epipaleolithic artifacts.

Site 194 is a relatively pristine Middle Paleolithic scatter eroding out of some marls on the south shore of Lake al-Wahīda, some 100-150m to the northwest of Khirbat al-Wahīda (Site 193). Well-preserved marls to the north of the site exhibit the accordant platforms indicative of the most recent, highest stillstand. The industry, mostly on chocolate brown flint like that from *Jabal Juththa*, some 5km to the north, is very 'bladey' and probably dates mainly to the Middle Paleolithic. Many pieces exhibit the dihedral and multifaceted striking platforms typical of the Levantine Mousterian. Vegetation suggests a small spring or seep in the area, and the fresh condition of the artifacts might indicate some potential for excavation.

The eight collections described in **Table 5** were recorded primarily by the field observation of lithic scatters in the vicinity of much later architectural sites identified on the basis of pottery. Although virtually all 2005-season sites produced at least some stone artifacts, in these cases lithics were concentrated at sufficient densities to warrant a separate collection. Inspection of the local setting of the architectural sites sometimes revealed the presence of springs, e.g., Site 162, or

marls, e.g., Sites 163 and 164, associated with small, ephemeral lakes that were not recorded on the NRA surveys. In some cases, e.g., Site 162, the springs are active today, doubtless because of their locations along major bedrock contacts that constituted aquifers, any particular spring eye ceasing to flow, and being reactivated, dozens of times over hundreds of millennia. Except where spring tufas and calcites are preserved, there is little site-contextual integrity. Heavily wind-abraded artifacts from all the Paleolithic time periods are noted. The average number of pieces recovered at the sites listed in **Table 5** was 27, whereas the mean for those in **Table 4** was 62, underscoring the importance of proximity to fresh water sources in these generally very arid environments.

Conclusions

The results of our first infield season were both surprising and gratifying. We did not think that in one season of work we would have "found" so many sites that had not been previously reported by the many individuals who have worked in the area over the past 100 years. We knew, of course, about the main sites along the main roads in the survey territory that had been reported on several occasions. However, we were surprised to discover so many farmsteads, hamlets and/or villages in the wadis that lead west and east from these main roads.

One of the valuable contributions of the ARNAS project is the pin-pointing of all sites discovered. This is due to the fact that they are now identified on the ground by their GPS-obtained coordinates. Thus, all future explorers will be able to find them.

Relative to the objectives of the project, we did discover 209 sites in our first season of work. Most of these sites are architectural ones associated with farming activity. They are located in the mountainous region of the territory, that is, in Zone II. These sites range in date from the Lower Paleolithic to the Modern period. However, there are periods when there is little or no evidence of sustained human presence in the area. We were able to identify and survey the Pleistocene lakes that the NRA had previously identified in our area of interest. Lithics from the Middle Paleolithic period were the mostly commonly collected materials associated with these lakes. The *Khaff Shabib*, probably a boundary line between the "desert" and the "sown", was noted and designated as ARNAS Site 050. This identification first took place in the northern extremity of the survey territory, just to the east of

Table 5: ARNAS 2005 Season Lithic Sites not associated with NRA-Identified Lakes.

A. Non-Levallois Elements	162	163	164	165	166	167	172	183
1. Flakes:								
flake, 1DC	1	4	2	1	1			
flake, 2DC	3	9	4		1	1	2	
flake, plain	5	16	18	4	3	5	5	13
flake, trim (<2cm)		3	1	2		1	1	3
flake, natbk	1							
2. Blades:								
blade, undiff'd	3	7	11	1	2	2	2	13
blade, natbk								
bladelet (<3cm)								17
3. Miscellaneous:								
burin spall								
fk, core ren edge								1
fk, platform tablet								
fk, core ren unsp		1						
B. Levallois Elements								
1. flakes			2					
2. points			1					
C. Cores								
1. Levallois								
flakes								
points								
2. Discoidal								
full								
partial								
3. Single Platform								
flake	1	1	1				1	
blade							1	
bladelet (<3cm)								
mixed		1			1	2		
4. Opposed-Multiple								
flake		1					2	
blade								
bladelet								
mixed								
5. Other (fragments)								
	2	1	1		1	4		
D. Shatter								
		5	6					
E. Retouched Pieces								
SS, convex on flk		1	1					
SS, straight on flk			1					
ES, on flk								
ES, on blade	1		1					
ES, on ret blade								
ES, keeled on bld								
ES, double on bld								
BU, dihedral								1
notch, on flk		1	1	1				
denticulate, on flk								
bld w/ oblg trunc								
bld, backed						1		
CRB-1			1				1	
CRB-2								
biface, partial								
biface, complete							2	
ES/CRB-1/dentic								
pseudo lev pt, ret								
perforator, on flk								
F. Total:	16	50	52	9	9	20	13	48

Ayl, ARNAS Site 001. The wall line was again encountered at Al-Muraygha, ARNAS Site 196, in the southern segment of the survey territory. However, we made no effort in our first season of work to follow it to its southern-most extremity. The data collected from our 2005 season will be important as we compare the findings of this year's work with that of the director's previous projects, namely, the WHS, SGNAS, and TBAS, in the area of ancient Edom.

It is abundantly clear that it was from these settlements that food would be provided to a major centre such as Petra. For in this area there is the possibility for the growing of barley, wheat, lentils, olives, citrus fruits, and so forth. In addition, in the mountainous area of the territory there is abundant pasturage for goats and sheep.

The question remains as to whether or not the ancient settlements were inhabited year-round. We were fortunate that we were in the field during both the growing and harvesting of wheat. Due to this, there were a large number of Bedouin in the area engaged in agricultural activity. And one of these Bedouin told us that they went to al-Ḥumayma for the winter months. This is easy to understand since it would seem that it would be very difficult to live in a tent in this mountainous region during the periods of the year when there is both rain and snow.

As indicated previously, the plan is to return for two more infield season in the springs of 2006 and 2007.

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