THE SHAMMĀKH TO AYL ARCHAEOLOGICAL SURVEY, SOUTHERN JORDAN: PRELIMINARY REPORT (FIRST SEASON 2010)

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Introduction

The first season of "The Shammākh to Ayl Archaeological Survey, Southern Jordan" (SAAS) was carried out from April 23-June 4 and from June 14-19, 2010.[1] During the infield days of the project, team members stayed in the town of Wādī Mūsā, close by Petra. Preliminary analysis of both the lithics and ceramics were carried out at the American Center of Oriental Research, Amman during the last week of the season.

Objectives

The main objective of the SAAS project is to discover, record, and interpret archaeological sites in an area of approximately 600 square kilometers. The territory being investigated is part of the southern segment of the Transjordanian Plateau, that is, the so-called Edomite Plateau. It includes the area from just north of the village of Ayl in the south to Shammākh in the north, from the 1200m line on the west, and to the 1200m line on the east, that is, into the Jordanian desert immediately to the west of the city of Ma'ān (**Fig. 1**). The area is ca. 30 km (N-S) by ca. 20km (E-W). As Figure 1 indicates, however, the survey territory is not rectilinear but follows the 1200m elevation line on both the west and east.

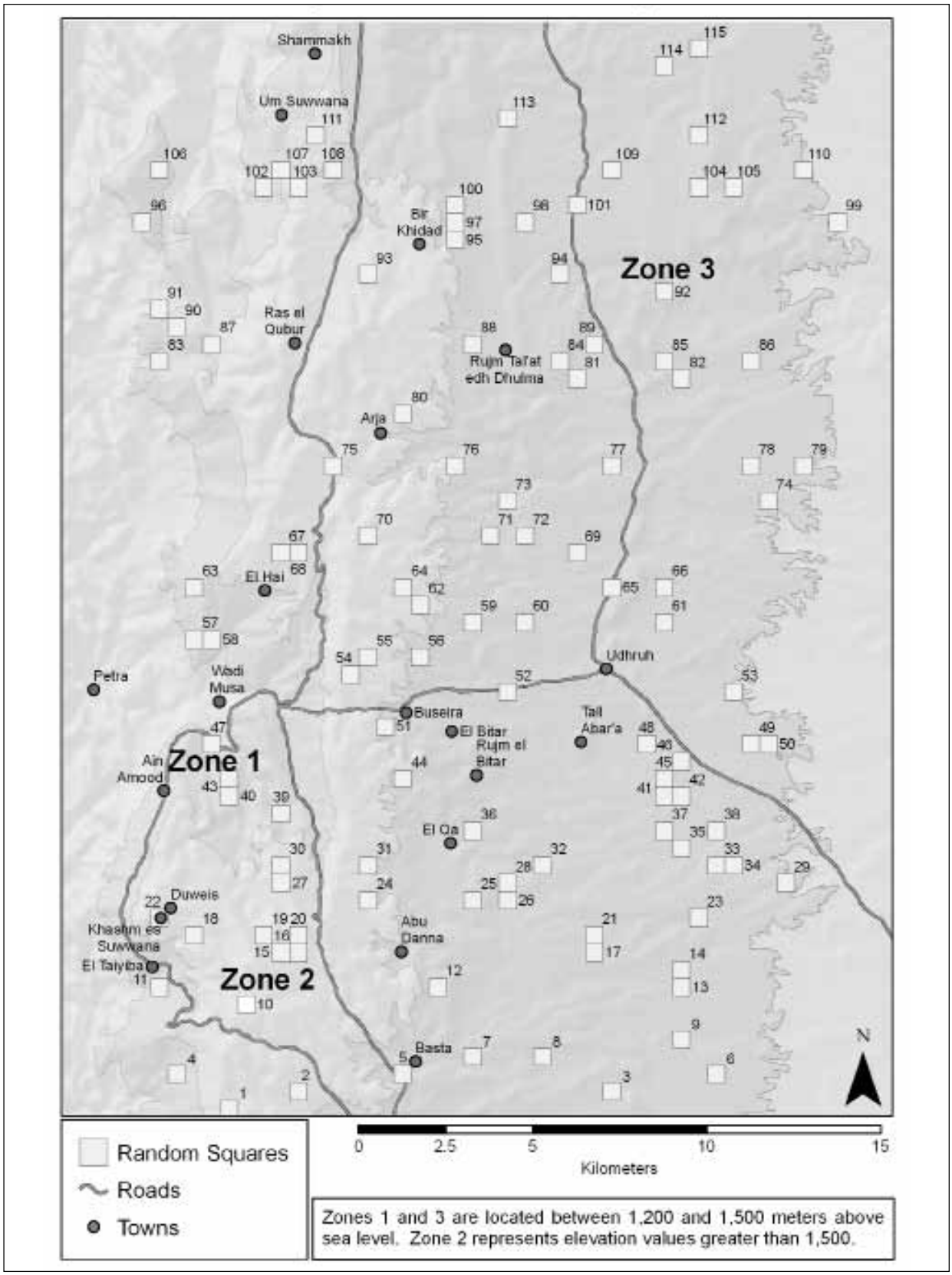
Most of the obtrusive sites, especially those along the main roads in the area, had been investigated prior to the beginning of our work. The SAAS project, however, surveyed not only those sites but also the ones that had been neglected, for example, camping and seasonal-pastoralists' sites (see, e.g., Hart 1987b: 287), farms, lithic sites (see, e.g, 'Amr *et al*. 1998: 504), that is, those sites with little or no architecture, as well as those sites which are away from the main roads of the area and not easily accessed.

A second goal of the project is to discover, on the basis of the artifactual material studied, the area's settlement patterns from the Lower Paleolithic (ca. 1.4mya) to the end of the Late Islamic period (AD 1918). Settlement pattern maps of the various cultural-temporal/time-stratigraphic units represented in the survey territory will be presented in the final report on the project to be published following the infield seasons.

Another objective of the project is the investigation of the Pleistocene (as late as ca. 10,000 BC) sediments and lakes in the eastern segment of the survey territory. This work is resulting in the discovery of Paleolithic materials, evidence of human presence, and information on paleoclimates in the area.

A fourth objective of the project is to document the many farms, hamlets, and villages that provided some of the food needs of the major international sites of the area. These sites include, for example, the fortress of Udhruḥ (Killick 1986a, 1987b, 1989) located within the survey territory and dated to the Roman-Byzantine period (1st century B.C.-7th century A.D.), the Hellenistic-Byzantine period (4th century B.C.-7th century A.D.) site of Petra immediately to the west of the area, and the Crusader-Middle Islamic period (11th-16th centuries AD) fortress of ash-Shawbak (Brown 1989; Pringle 2001) to the north.

1. Team members for the 2010 season were: Burton MacDonald, Director; Larry G. Herr, ceramic specialist; D. Scott Quaintance, photographer, mapping, Global Positioning System, and database and website manager; Hilary M. Lock, Global Positioning System and artist; Kelly Meagher, artifact registrar; and Ashraf Al-Khraysheh, representative of the Department of Antiquities of Jordan. Drs. Maysoon Al-Nahar, University of Jordan, and Debbie Olszewski, University of Pennsylvansia, carried out the preliminary analysis of the lithics.



1. The Shammākh to Ayl Archaeological Survey: Ecological Zones and Random Squares (Gary L. Christopherson).

A fifth goal of the SAAS project is to investigate further the *Khaṭṭ Shabīb* or "Shabīb's Wall," a low stone wall running in a generally north-south direction to the east of the *Via Nova Traiana* (Trajan's road built between AD 111-114). Survey-team members encountered this wall while working on both "The Tafila-Busayra Archaeological Survey 1999-2001, West-Central Jordan" (MacDonald *et al*. 2001: 408; MacDonald *et al*. 2004: 343 [TBAS Site 186]) and "The Ayl to Ras an-Naqab Archaeological Survey, Southern Jordan (2005-2007)" (MacDonald *et al*. in press). Several researchers had encountered it previously in various areas of southern Jordan (see, e.g., Kirkbride 1948; Parker 1986: 89; Abujaber 1995: 740; Gibson 2002: 169-72; Kennedy and Bewley 2004: 138-39).

A sixth objective is the discovery of inscriptions, rock drawings, and *wusūm* (tribal markings) within the area. Previous archaeological surveys in southern Jordan have found them in pastoral areas similar to that of the eastern segments of the SAAS territory (MacDonald *et al*. in press; see also Jobling 1986; 1989).

An additional objective of the project is to link up with previous work that the project director and some other survey-team members have carried out in Edom. This involves, in particular, a comparison of the findings of the SAAS project with the findings of four previous surveys, namely, "The Wadi al-Hasa Archaeological Survey 1979-1983, West-Central Jordan" (MacDonald *et al*. 1988), "The Southern Ghors and Northeast 'Araba Archaeological Survey" (1985-1987) (MacDonald *et al*. 1992), "The Tafila-Busayra Archaeological Survey 1999-2001, West-Central Jordan" (MacDonald *et al*., 2004), and "The Ayl to Ras an-Naqab Archaeological Survey, Southern Jordan (2005-2007)" (MacDonald *et al*. in press) that the project director conducted in Edom. A comparison of the settlement patterns of the SAAS project with those of these four will be published as part of the final report.

All the above-listed objectives will contribute to the writing of an archaeological history of southern Jordan from Wādī al-Ḥasā in the north to Rās an-Naqab in the south.

Archaeological Context

Glueck (1935) visited the proposed survey territory during his "Explorations in Eastern Palestine". Near the end of his work he was confident that "not very many ancient sites in Edom …, whose ruins have not been completely obliterated, remain undiscovered" (1939: xxiii). However, subsequent work, including the project director's (MacDonald *et al*. 1988, 1992, 2004; in press) has found this not to be so.

Although a number of explorers, archaeological survey teams, and excavators have worked in the survey territory, they have primarily devoted their investigation to areas along the main roads and have neglected other areas, for example, where lithic scatters and camp sites are likely to be found as well as hard-to-reach regions. Several of these projects are noted below in an attempt to situate the SAAS project in its archaeological context.

Because of the fact that the Roman Road (*Via Nova Traiana*), built to link Bostra in southern Syria to the Gulf of al-'Aqaba, cuts through the area, a number of researchers have been interested in it and its associated remains. At the end of the 19th century Brünnow and von Domaszewski (1904) investigated the road's route. Thomsen (1917) studied the milestones along it. More recently, Parker (1976; 1986), Fiema (1995), Graf (1979; 1995a-b), and Kennedy and Bewley (Kennedy 2004; Kennedy and Bewley 2004) have investigated the road and the watchtowers and fortresses along it. Abudanh (2006) traced the remnants of the road that passed through the proposed territory from Udhruḥ to Petra. Despite the above work, a systematic survey of the area has not been done. The SAAS project is doing this and thus adding to the knowledge of the Roman presence in southern Jordan.

Killick, in conjunction with his excavations at the Roman fortress of Udhruḥ, located in the eastern segment of the survey territory, carried out survey work (1980-1985) in the area of the site (1982; 1983a-b; 1986a-b; 1987a-b; 1989). However, he did not publish a final report on either. The SAAS project will complete much of what Killick left undone relative to his survey work.

Hart ("The Edom Survey Project") carried out two seasons (1984 and 1985) of survey work in the vast area from aṭ-Ṭafīla in the north to Rās an-Naqab in the south (Hart and Falkner 1985; Hart 1986a-b; 1987a-b). He describes his field

work as "mostly purposive vehicular transects" (1987b: 287), "flints were not collected, the survey concentrating on ceramic materials only" (Hart and Falkner 1985: 255). Hart states that, "it should be noted that evidence for temporary and transient occupation (such as camp sites) was not usually retrieved" (1986a: 337). The present project is remedying this by collecting, analyzing, and publishing the lithic materials and the evidence for transient occupation.

An important but unsystematic study related to a segment of the survey territory was that of the "Wadi Musa Water Supply and Wastewater Project" carried out in 1996 and 1998-2000 (ʻAmr *et al*. 1996, 1997, 1998 2000; ʻAmr and al-Momani 2001). The work was initiated to protect and document archaeological sites affected by the layout of the pipelines. Project team members followed the construction of the pipeline and recorded the sites discovered. The work indicates that "one outstanding result of the archaeological survey is the large number of flint sites discovered" (ʻAmr *et al*. 1998: 504). The SAAS project is documenting these sites.

Tholbecq carried out "The Jabal ash-Sharah Survey" in 1996 and 1997. His interest was in documenting the occupation of Petra's hinterland from Edomite to Late Islamic times (900 B.C.-A.D. 1917) (Tholbecq 2001: 399). He limited his work to the natural extent of the Wādī Mūsā drainage basin, covering an area of around 72 square kilometers.

Abudanh followed up on Killick's work in his study of the changes to settlement and land use that occurred in the region of Udhruḥ following the annexation of the Nabataean kingdom by Rome in A.D. 106 until the Early Islamic Period, i.e., into the seventh and eighth centuries. He describes his work as a "vehicular survey" (2006: 44). The SAAS project, using pedestrian transects, is discovering materials that could not otherwise be obtained and, thereby, contributing to an understanding of the archaeological history of the region.

In addition to the survey work outlined above, a number of sites within the SAAS territory have been excavated. The most noteworthy of these are: the Neolithic site of Basṭa (7th millennium B.C.) (Nissen *et al*. 2004); Khirbat an-Nawāfla/Wādī Mūsā (ʻAmr *et al*. 2000), a multi-period site[2]; Iron Age Ṭawīlān (Bennett and Bienkowski (1995); and Udhruḥ (Killick 1989), referred to previously.

Despite all the work outlined above neither a systematic nor comprehensive survey of the area has ever been undertaken. Moreover, many of the contributions to knowledge, outlined in the "Objectives" segment above, have still to be made.

Geomorphology and Climate

The geomorphology of the SAAS territory includes two regional physiographic provinces: 1) the Highlands east of the Rift Valley; and 2) the Central Jordan Pediplain (Bender 1974, 1975; see also Tarawneh 2004: 23). The former occupies the hilly area on the west while the latter the eastern part of the territory.

Altitudes vary within the territory: 1200m on the western and eastern boundaries; 1521m just southeast of Shammākh; 1736m in the central segment; and 1506m at Ayl in the south-central area, immediately south of the survey territory. The western half of the survey area is part of the ash-Sharāh Mountains which extend from ash-Shawbak in the north to Rās an-Naqab in the south.

Present annual rainfall in the area varies from a high of around 300mm to less than 100mm: ca. 300mm in the ash-Shawbak-Nijil region (ca. elevations of 1500m or more); ca. 200mm immediately to the east and west (ca. elevations of 1500-1300m); and 100mm in the area between Udhruḥ and Maʻān in the eastern portion of the territory.[3] Thus, the eastern segment is located in the steppe, i.e., the area between "the desert and the sown", where evidence of pastoral activity in many archaeological periods is present.

Methodology

The SAAS project's "Objectives" outlined above are being accomplished by surveying, analyzing, interpreting, and publishing the archaeological materials recorded within the territory.

For archaeological-investigative purposes, the survey territory is divided into three topo-

2. Khirbat an-Nawāfla/Wādī Mūsā is now the site of Bayt Zamān, a touristic complex, and is, thus, almost completely destroyed.

3. It ought to be noted that at least 200mm of annual precipitation is required for dry-land farming.

graphical zones: 1) Zone 1 (the western segment) lies in the area where elevations are between 1200m and 1500m; 2) Zone 2 (the west-central segment) is the mountainous region where elevations values are greater than 1500m (actually a segment of Jabal ash-Sharāh); and 3) Zone 3 (the eastern segment) is the area from the 1500m to the 1200m line (see Figure 1).

The principal method for discovering archaeological materials, including sites, is a technique based on recording the remains collected while transecting randomly-chosen squares (500 x 500m) in the three topographical zones of the survey territory (Herr and Christopherson 1998).

A Geographic Information Systems (GIS) database randomly selected the 115 squares which represent about five percent of the total area of each of the topographical zones in the survey territory. Gary Christopherson, Director, Center for Applied Spatial Analysis, University of Arizona, Tucson, prepared this aspect of the project and the map (see, Figure 1).

The investigation of these random squares in each zone performs three primary functions: 1) it provides a baseline, against which artifactual material collected from archaeological sites in the region may be compared; 2) it forces survey team members into all areas of the territory, eliminating any sampling bias the team may have toward easily accessed areas; and 3) recording random squares has proven to be an effective means of discovering sites, within, adjacent to, and while traveling to/from the squares. In essence, the recording of random squares provides access to a statistically valid sample of archaeological materials, including sites, within the territory.

The GIS database provides the coordinates for each of the 115 randomly-chosen squares. Team members use a Global Positioning System (GPS) to locate one corner of a square. Once it is located, they (5 persons) position themselves, usually a distance of ca. 50m apart (the visibility in the region is generally good) along one of the lines of the square. With the help of compasses to keep a straight line, team members transect the square, picking up lithics, sherds, glass, slag, and other portable artifactual materials. (For each 500 x 500m square, two transects were walked).

The recording of a random square involves recording data on the "Random Square Data Sheet". The transecting and recording of each square takes approximately two-person hours. (This time does not include locating and getting to the square).

When an archaeological site, that is, individual features that combine in a variety of ways to form a single unit, was discovered within the square, it was recorded separately on a "Survey Site Sheet." The different features, e.g., cistern, cave, remnants of a building, tomb, road, etc., that comprise the site were recorded on the sheet.

Once the random square and any archaeological sites within it were recorded, survey-team members turned their attention to the surrounding area in their search for sites. We spent a reasonable amount of time searching for and recording any archaeological sites in the vicinity of the square. In addition, we spoke with the people living in and/or working in the area, e.g., farmers and shepherds, about the whereabouts of sites. Moreover, while driving to/from the square, team members were on the lookout for sites. When located, they were also recorded on "Survey Site Sheets."

Once a site was "discovered", it was "sherded" for artifacts, described, and plotted on a map using the coordinates obtained from the GPS unit. Survey data sheets were filled out initially in the field. All collected materials were labeled before being placed in the vehicle. Additional information is being added as analyses progresses.

Digital photographs were taken of the topography of all random squares and the features of all sites. These were added to the project's database; they are used while analyzing the artifactual materials from squares and sites; some will be published in B & W in survey reports; and all will be put on a DVD which will be part of the project's final report.

Daily, preliminary washing and registering of the collected artifacts was done; "Survey Artifact Forms" completed; photographs taken of significant artifacts; and descriptions of the random squares transected and sites investigated were entered into the project's database.

Following the infield season, selected artifacts, namely, lithics and sherds, were shipped,

with the Department of Antiquities' permission, to the home universities of the director and his collaborators. These are being further analyzed, drawn, photographed, and prepared for publication.

Results of the 2010 Season

During the 2010 season, survey-team members transected 58 (50.43%) Random Squares: 8 in Zone 1; 16 in Zone 2; and 34 in Zone 3 (**Table 1**). This was done beginning in the southern segment of the survey territory and moving northward in an orderly fashion to the area of Udhruḥ on the east and just south of al-Ḥay on the west (see **Fig. 1**).

Survey-team members collected lithics from 88 and sherds from 100 percent of the random squares. The lithic materials collected are typical of surface finds. They include: bifaces; borers; burins; cleavers; cores — a variety from several periods; Levallois flakes, points, and blades; perforators, some with notches; and scrappers — end, side, and transverse (**Fig. 2**).

On the basis of analyses to date, materials, primarily lithics and sherds, which survey-team members collected in the 58 random squares range in date from the Lower Paleolithic to the Late Islamic period. As the Figure 3 indicates, the Middle Paleolithic (at 59%) is the best represented of the cultural-temporal units from the prehistoric periods in the squares. For the historic periods, the Iron 2 (at 26%), Nabataean (at 71%), Roman (at 33%), Byzantine (at 72%), and Late Islamic (at 29%) are those best represented cultural-temporal units in them.

As indicated above, the Middle Paleolithic (MPL) period is well represented, especially in the collected materials from the random squares in Zone 3. In fact, it is the predominant one. This is especially true for those squares which lie immediately both to the west and east of the main road between Udhruḥ and Ma'ān (see Figure 1). Relative to this, and understandably, sites, whether within or nearby (e.g., Sites 050-054) them, also yielded lithics from this period.

The small number of sherds collected and the absence of enclosures, which indicate seasonal-pastoralists' camps, support the position that the eastern segment of Zone 3 was probably an arid one throughout the Holocene.

Survey-team members recorded 154 sites (**Table 2**).

Forty-seven (or 30.50%) of these sites are within while 32 (or 20%) of them are nearby the 58-transected, random squares (**Table 3**). Thus, it is probable that some of the 154 sites would not have been recorded if team members were using a methodology that did not rely on the transecting of randomly-chosen squares.

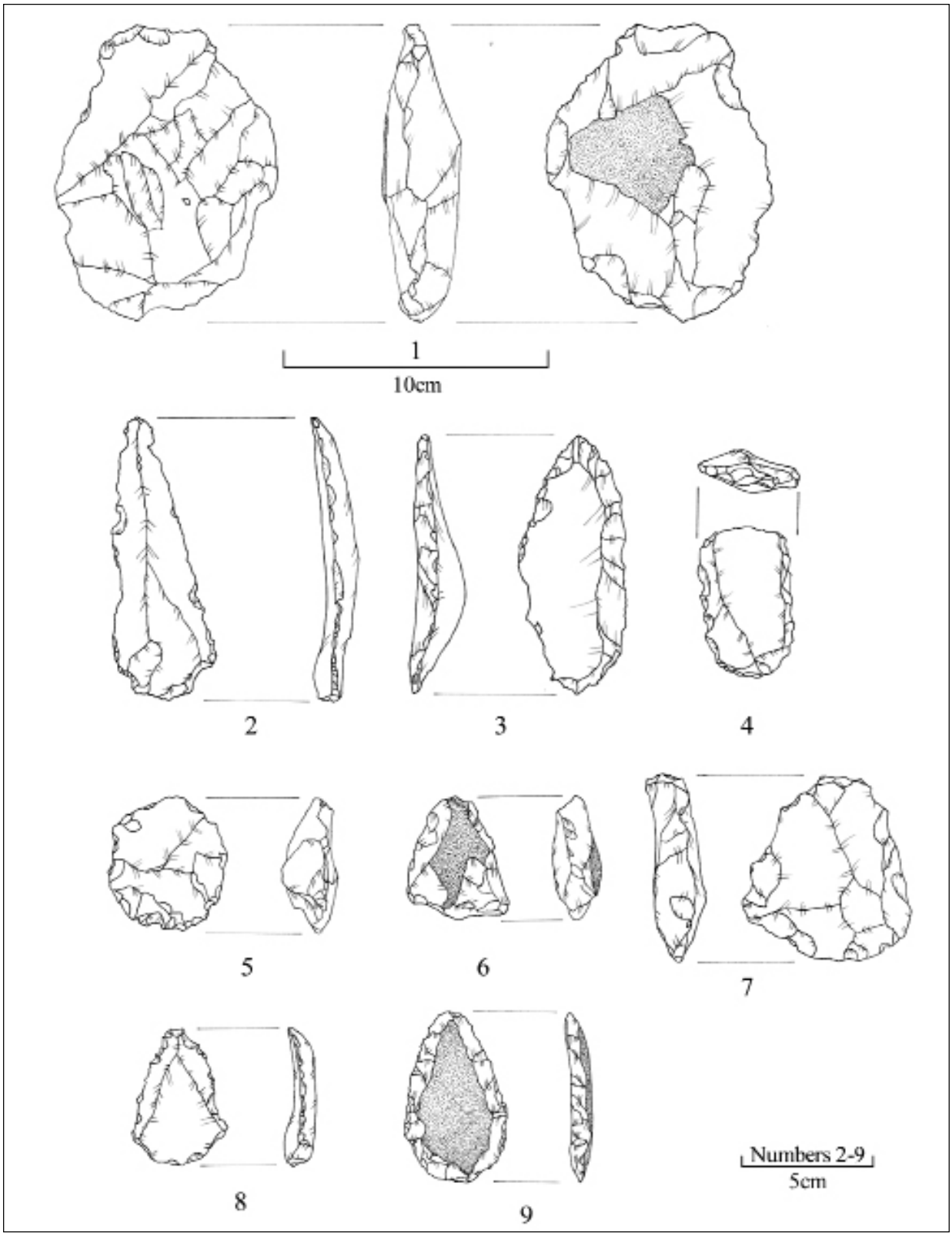
The cultural-temporal units best represented at the 154 sites are: MPL (at 5%); Iron 2 (at 17.53%); Nabataean (at 58%); Roman (at 23%); Byzantine (at 66%); and Late Islamic (at 33%) (**Fig. 4**).

The ceramic specialist read and handled the pottery in much the same way as he did for "The Tafila-Busayra Archaeological Survey 1999-2001, West-Central Jordan" (MacDonald *et al.* 2004) and "The Ayl to Ras an-Naqab Archaeological Survey, Southern Jordan (2005-2007)" (MacDonald *et al.* in press). Diagnostics were pre-registered and were saved to be shipped to North America for publication where they will be published with their respective random squares and sites.

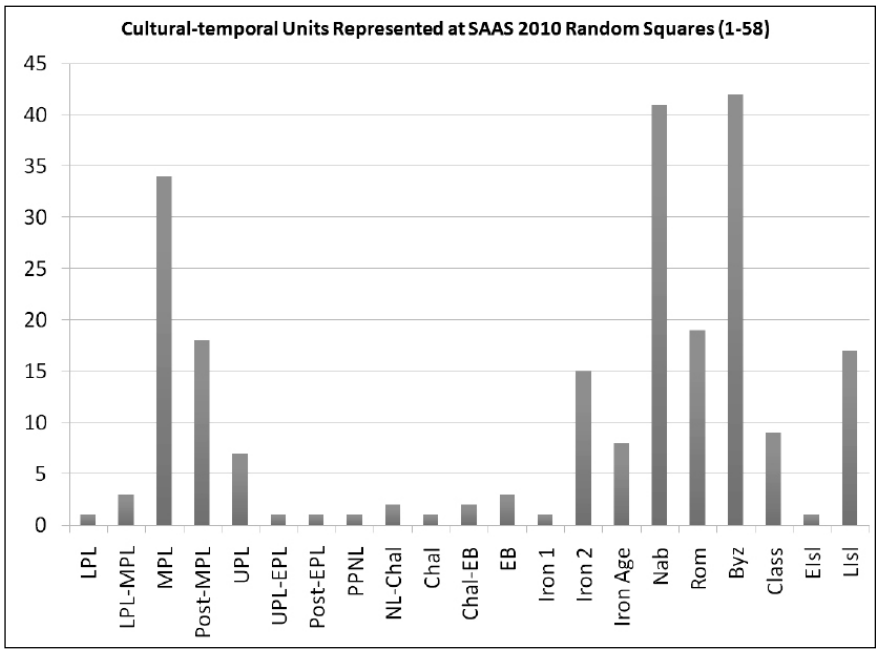
We had been requested to break some of the broad periods, e.g., the Byzantine period, into sub-periods. After considerable thought, we have retained the previous system of naming only the broad periods. We feel we need to avoid problems that arise when there are too many transitions. Some pottery may be isolated to a single sub-period, but others span two periods, etc. We felt that breaking the pottery into sub-

Table 1: List of Random Squares transected in each Topographical Zone of the SAAS Project Territory – 2010 Season.

Zone 1: 4; 47; 40; 43; 39; 11; 57; 58.
Zone 2: 1; 2; 10; 22; 27; 30; 15; 19; 16; 20; 24; 31; 51; 18; 54; 55.
Zone 3: 3; 5; 6; 7; 8; 9; 13; 14; 35; 37; 38; 41; 42; 44; 45; 46; 48; 36; 29; 33; 34; 23; 25; 26; 28; 17; 21; 32; 12; 49; 50; 52; 53; 56.



2. 1. LPL-MPL Biface (RS 048); 2. MPL Levallois Point (RS 021); 3. MPL Transverse Scraper (RS 028); 4. MPL End-scraper (RS 041); 5. MPL Single-Surface Core (RS 048); 6. MPL Convergent Side Scraper (RS 003); 7. MPL Levallois Flake Core (RS 050); 8. MPL Levallios Point (RS 050); 9. NL-Chal Scraper (RS 013) (Hilary M. Lock artist).



3. Cultural-Temporal Units Represented at SAAS 2010 Random Squares (1-58) (D. Scott Quaintance and Curt Stepp).

Table 2: List of Sites – SAAS 2010 Season.

Site#	UTM Coordinates*	Site Name	Function**
001	0749785/3346009		Tomb/Grave and Inscription
002	0749889/3346484		Sherd scatter/camp (?)
003	0752580/3346887		Inscription
004	0752510/3346772	*Khaṭṭ Shabīb*	Boundary line
005	0744242/3345149	Tal'at Sayf	Agricultural building (?)
006	0746843/3346220	Rujum	Watchtower
007	0747861/3347445		Pastoralists' camp (?)
008	0747681/3347491		Unknown
009	0738373/3322237		Agricultural building (?)
010	0738655/3344867		Agricultural village
011	0739017/3345249		Agricultural hamlet or village
012	0740649/3446412		Agricultural hamlet or village
013	0740832/3345656		Agricultural hamlet or village
014	0751686/3347974		Seasonal, pastoralists' camp (?)
015	0751539/3349110		Cemetery
016	0751977/3349155		Inscription
017	0736915/3346810		Winnowing area
018	0738557/3345597		Farming complex
019	0738458/3346001		Farm building
020	0738450/3349134	Kh. Majdal	Agricultural village
021	0739585/3348572		Pastoralist's camp/corral (?)
022	0743635/3346958		Rock-cut tombs
023	0743858/3346865	Basṭa	Neolithic village
024	0737319/3348089	Kh. ar-Ruways	Fortress (?)
025	0736804/3351228	Khashm aṣ-Ṣuwwan	Agricultural village
026	0736900/3351202	Duways	Agricultural facility
027	0736830/3351282		Water or storage facility (?)
028	073791/3349921	'Ayn Ghazāl	Spring and water installations

029	0737592/3348795	Kh. Ḍbā‘	Well, channels, cemetery, etc.
030	0736930/3355721	Kh. Brāq	Agricultural village site
031	0736870/3354721	‘Ayn Amūn	Spring/water resource
032	0736544/3354140	Kh. al-Mu‘allaq	Agricultural village site
033	0736760/3354381		Rectangular structure
034	0736277/3353201	Kh. Dubayl	Fortress (?)
035	0736921/3347507	Kh. Ḥubays	Agricultural village site
036	0739274/3347753	Kh. al-Mabrak	Agricultural village site
037	0741388/3346479		Agricultural storage facility (?)
038	0741376/3345956		Farm
039	0741677/3357249	Ar-Rasīf	Roads intersection
	0741664/3357285		
040	0743217/3357202	Bīr al-Biṭār	Agricultural village
041	0744622/3357806		Pastoralists’ camp – seasonal
042	0743729/3357361		Pastoralists’ camp – seasonal
043	0743880/3357097		Farm
044	0743685/3357050		Pastoralists’ camp – seasonal
045	0743495/3356843(W)	Umm aṭ-Ṭīrān	Farm or agricultural hamlet
	0743680/3356859(E)		
046	0742235/3358175		Shepherd’s camp – seasonal
047	0743796/3356216		Pastoralists’ camp – seasonal
048	0743773/3355967		Agricultural camp – seasonal
049	0751655/3353462		Tomb
050	0751206/3353698		Lithic and camping (?) site
051	0750692/3354191		Watchtower (?)
052	0751118/3356403		Lithic scatter – dense
053	0750967/3356082		Inscription
054	0751028/3356224		Camping site and inscription
055	0745963/3354145	Kh. al-Mukhfiyyah	Pastoralists’ camp – seasonal
056	0745237/3354026		Farming installation – seasonal
057	0744460/3354299		Pastoralists’ camp – seasonal
058	0744181/3355175		Agricultural village/hamlet
059	0744837/3354670	Rujm al-Biṭār	Watchtower
060	0744156/3354001	Umm al-Futas	Well/reservoir
061	0746168/3356840	Dār ‘Ali ar-Rabī‘	Farm
062	0745244/3356619	Dar ‘Ali Mu‘ammar	Farm
063	0754824/3352162		Inscription
064	0752742/3352512		Inscription
065	0752583/3352482		Inscriptions
066	0751915/3351189		Inscription
067	0752002/3351143		Rock art
068	0751997/3351210		Rock art
069	0736709/3349346	Aṭ-Ṭayyibah	Traditional (Ottoman) village
070	0737029/3349105	Kh. al-Hāmah	Agricultural village
071	0741239/3346967		Cistern
072	0739020/3355502	Bīr Ṣarīḥ	Well and associated (?) building
073	0738691/3355473		Farming/agricultural features
074	0738514/3355373		Farm
075	0738500/3355064	Mughur ar-Ruhbān	Agricultural building
076	0738807/3355107		Watchtower

077	0738468/3354556		Pastoralists' camp – seasonal
078	0738868/3354503		Cistern
079	0739051/3354175	Kh. ʻAyn al-Hajīm	Traditional, extended-family hamlet
080	0739204/3353128	Kh. al-Minyah	Agricultural village
081	0739071/3353477		Agricultural hamlet/farm
082	0739251/3353957		Agricultural hamlet/farm
083	0739216/3354075		Water mill
084	0738971/3353627		Farm: cistern and associated buildings
085	0738710/3354042	Rujm ʻAyn al-Hajīm	Defensive – related to water source
086	0740334/3354338		Defensive – related to water source
087	0740236/3354056		Hunting/camping site - seasonal
088	0741134/3353452		Agricultural village site – seasonal
089	0741040/3351751		Threshing/winnowing area
090	0741135/3350659		Cistern and associated structures
091	0739980/3352862		Agricultural facility – seasonal
092	0739848/3352862		Pastoralists' camp – seasonal
093	0739897/3351736	Kh. al-Muḥaraq	Fort (?) and/or waystation (?)
094	0740584/3354339	Kh. al-Farqadiyyah	Defensive – related to water source
095	0739432/3351227		Graves (?)
096	0739673/3351284		Graves (?)
097	0739782/3349997	Kh. Samra	Temple (?); Waystation (?)
098	0740537/3350108	Kh. Talʻat ʻUmar	Agricultural Town
099	0740572/3350930		Cisterns and/or caves
100	0740646/3350637		Tomb (?) and/or watchtower (?)
101	0740894/3351048		Tomb (?) and/or watchtower (?)
102	0740613/3350860		Road
103	0741134/3349153	Rujūm (?)	Cemetery (?)
104	0741793/3346853		Cistern
105	0746065/3351491	Kh. al-ʻAbd East	Watchtower
106	0746817/3352080	Kh. Wādī Ḥissī	Extended Family Farm
107	0746987/3351101	Kh. al-Muʻāni	Cisterns
108	0746952/3351002		Circular enclosure – seasonal camp
109	0746748/3350772	Kh. al-ʻAbd West	Tomb/watchtower (?)
110	0747708/3352520		Circular enclosure – seasonal camp
111	0747380/3352804		Circular enclosure – seasonal camp
112	0750630/3350995		Caravanserai (?)
113	0747958/3351824		Cave – dwelling
114	0750630/3350995		Watchtower and tombs
115	0744827/3349436		Three small enclosures
116	0744867/3347856	Rujm Basṭa	Watchtower
117	0744972/3348411		Enclosures
118	0744091/3350088	Abū Dannah	Fort Associated with water source (?)
119	0750630/3350995	Kh. Abū Dannah	Traditional agricultural village
120	0742674/3350024	Kh. Tallāt ʻAli	Village and/or watchtower (?)
121	0743157/3349187	Kh. Zahārah I	Agricultural village
122	0743215/3349305	Kh. Zahārah II	Agricultural village
123	0743209/3348579	ʻAyn Zahārah	Spring
124	0743193/3350501		Way station on road (?)
125	0742543/3350295	ʻAyn Tallāt ʻAli	Spring
126	0743315/3350857	Rujm al-Khaṭābiyya	Watchtower

127	0742705/3351507	Kh. Umm Aj-Jarād	Agricultural village – seasonal
128	0742960/3351941		Pastoralists' and/or hunting camp
129	0743087/3351920		Pastoralists' and/or hunting camp
130	0743024/3351647		Pastoralists' and/or hunting camp
131	0742742/3352929		Fort (?) – small
132	0742075/3352588	Kh. al-Haṭeh	Agricultural village site
133	0742445/3352136		Watchtower and tombs
134	0743878/3355069		Enclosure – pastoralists' camp
135	0743909/3355528		Lithic and sherd scatter and tombs
136	0737859/3351536	Kh. as-Sa'idiyyah	Well and associated structures
137	0736795/3351229	Khashm al-Ḥad	Agricultural village site
138	0742556/3358302		Agricultural station – seasonal (?)
139	0742743/3358972		Agricultural hamlet; Fort (?)
140	0742760/3357913		Spring and associated enclosure
141	0754518/3356428		Inscription
142	0754144/3356197		Aqueduct
143	0753941/3355793	Kh. al-Faqī	Agricultural village
144	0737821/3359526		Watchtower (?); agricultural facility (?)
145	0737966/3359297		Watchtower (?)
146	0738070/3359042		Agricultural building (?)
147	0738451/3359435		Roadway/pathway to spring (?)
148	0738090/3359572		Tomb (?)
149	0737794/3359248		Unknown
150	0749526/3358247	Udhruḥ	Roman Legionary Fortress
151	0750424/3357802	Ṭāḥūnah	Windmill
152	0750391/3358215	Kh. ad-Dubays	Watchtower
153	0750204/3359198	Juraydah	Agricultural features: cisterns; caves; corrals; and rectilinear structures
154	0749792/3359969	Jabal Mūsā al-Ash'arī	Fort; watchtower

* The coordinates system is UTM Zone 36N, European Datum 1950.
** Of course, the determination of "function" on the part of SAAS 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 3: Sites Within and Nearby Random Squares – SAAS 2010 Season.

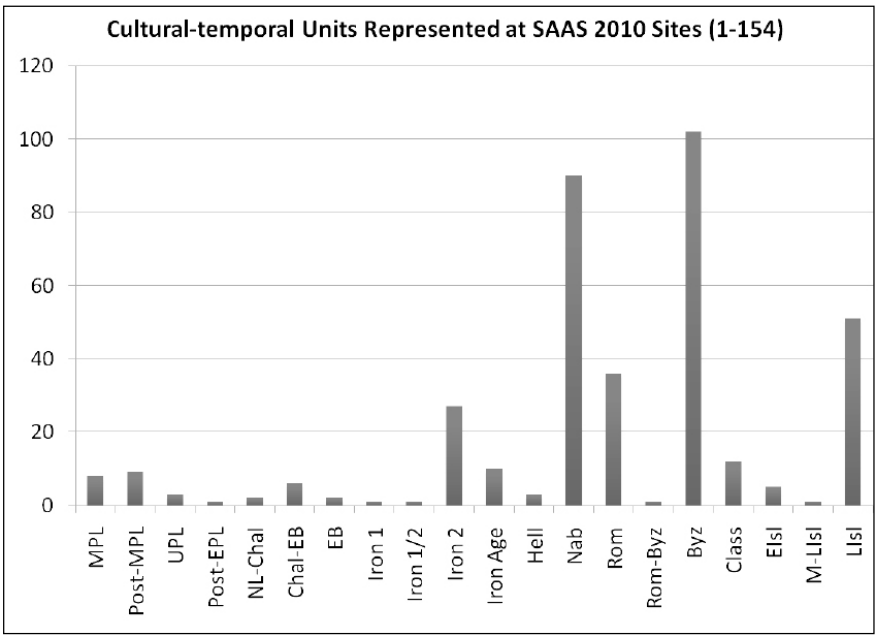
Sites within: 001; 002; 007; 008; 012; 014; 015; 016; 022; 023; 025; 026; 027; 045; 046; 050; 053; 063; 064; 068; 070; 073; 074; 075; 076; 078; 086; 087; 091; 098; 099; 100; 102; 106; 110; 115; 127; 128; 129; 134; 139; 142; 144; 145; 146; 147; 149 (n=47).

Sites nearby: 004; 013; 017; 018; 019; 020; 021; 040; 049; 051; 054; 055; 065; 067; 072; 077; 092; 095; 096; 097; 101; 111; 130; 131; 135; 138; 141; 143; 144; 148; 195 (n=31).

periods would have made the readings too subtle for many database searches to handle easily and could skew the results of future researchers. We believe it is better to let researchers find all "Byzantine" vessels and to decide themselves what the precise range of the forms allow.

As in the previous-two surveys the term "Nabataean" implies the typical pottery of Petra from the late Hellenistic to Early Roman periods. A "Roman" reading usually means Late Roman, but could also include forms that began in the first century AD.

This season was remarkable in that Early Bronze Age holemouth jar rims were found in one random square (005) and at one site (040). Moreover, the imported pottery which team



4. Cutlural-Temporal Units Represented at SAAS 2010 Sites (1-154) (D. Scott Quaintance and Curt Stepp).

members collected includes African Red Slip Ware (RSs 002 and 019), terra sigillata (Site 137, Khasham al-Ḥad), and ware from the Black Sea (3rd-4th century) (Site 035, Kh. al-Ḥubays). This indicates that the international trade impacted not only the city of Petra but nearby areas and sites.

The type of sites documented include: agricultural hamlets and villages; an aqueduct; enclosures (probably seasonal-pastoralists' camps); farms; forts; graves/tombs; inscriptions and rock art; lithic and sherd scatters; rectilinear structures; roads; watchtowers; and winnowing areas. The function of some of the recorded sites is unknown and can probably only be determined by further investigation, e.g., excavation.

What is especially notable about the location of many of the sites is the fact that they are in areas which are now unused for cultivation but only for pasturage. These hard-to access areas show evidence off extensive use in the past. Within them, there is evidence off impressive terracing, now unused and damaged due to erosion. Thus, there were probably major changes over the past couple of millennia not only in climate but deterioration in land-cover in the areas affected.

SAAS team members judged a number of the sites to be good candidates for excavation (**Table 4**). This judgment was made due of the contribution that they could make to the archaeological history of the area and/or the fact that they are in danger of damage due to development, e.g., residential construction, road building, and/or field clearance for agricultural purposes.

The *Khaṭṭ Shabīb* was encountered in several places throughout the survey territory. It was recorded as Site 004 which is located to the W of RS 003 – in Zone 3 – in the SE segment of the survey territory. It continues northward through Zone 3.

Inscriptions and/or rock art were recorded at ten sites (003; 015; 053; 063; 064; 065; 066; 067; 068; and 141). They will be published as part of the project's final report.

Comparison of Material Collected from the Random Squares and Sites

A comparison of the best represented cultural-temporal units, namely, the Middle Paleolithic, Iron 2, Nabataean, Roman, Byzantine, and Late Islamic, indicates a higher percentage of them represented in the random squares than at the sites. The only exception is the Late Islamic period where there is a higher percentage of this unit present at the sites than in the squares. The reason could be that in the squares one is transecting an area of 500 x 500 metres. The dimensions of the sites are quite small in comparison.

Conclusions

During the 2010 season, SAAS team mem-

Table 4: Sites that are good Candidates for Further Investigation – SAAS 2010 Season.

Site #	Name (if any)	Reason(s) for Excavation
007		Surprisingly large stones which comprise it
010		Multi-period and its size
024	Kh. ar-Ruways	Damage probable due to residential development
034	Kh. Dubayl	Due to danger from development
035	Kh. al-Ḥubays	Due to danger from development
036	Kh. al-Mabrak	In danger from field clearance
037	Tallāt al-Ḥajjāj	Its location makes it vulnerable to destruction
059	Rujm al-Bīṭār	Fairly intact and excavation could lead to valuable information
070	Kh. al-Hāmah	On account of development, could be destroyed
071		Excavation could reveal its function; field clearance and road construction could destroy it
078		Due to possible damage from field clearance and house building
080	Kh. al-Minyah	Intact site that may provide information about an Iron Age farming village
085	Rujm ʻAyn al-Hajīm	Due to its importance as a protector of a water source
086		Could provide information on a site defending a water source (same for Site 094)
094	Kh. al-Farqādiyya	Due to its importance as a protector of a water source
097	Kh. Samra	Due to its uniqueness and danger from development
098	Kh. Tallāt ʻUmar	Its size and probability of destruction by looters
118	Abū Dannah	In danger of destruction due to development
150	Udhruḥ	Because of its importance as a major Roman fortress
154	Jabal Mūsā al-Ashʻarī	Relatively intact, small fortress and rock shelter/cave on its E-facing slope

bers did not document all the archaeological sites within the study area between Ayl in the south and Udhruḥ and al-Ḥay in the north. A case-in-point is the sites which team members of the "Wadi Musa Water Supply and Wastewater Project" recorded (ʻAmr *et al*. 1996, 1998; ʻAmr and Al-Momani 2001). A number of these sites, all above the 1200m line on the west and located in the northwestern and eastern segments of the town of Wādī Mūsā, still need to be incorporated into the project's findings so that a complete picture of the settlement patterns of the area may be presented. This will be done in subsequent seasons and publications of the project.

The area of the SAAS project is one in which field clearance and the building and maintenance of terrace walls has gone on for millennia. As a result, there are numerous stone piles, some of them with impressive and imposing retaining walls, and heavily-eroded terraces throughout the territory. Although these are the result of human endeavours, we did not record them as archaeological sites. Nevertheless, if they occur within a random square or near a site, they are generally noted in our random square and/or site's description.

Jordan is undergoing rapid development in most areas of the country. This development is leading to the destruction of many archaeological sites. Thus, the findings of the survey are being communicated immediately to the Department of Antiquities of Jordan in order that important sites may be "salvaged" and as much information as possible obtained from them before further damage is done.

The lithic and sherds not shipped to Canada for further analyses are stored in the Department of Antiquities' storerooms in ash-Shawbak Castle. They are thus available, with the Department of Antiquities' permission, to researchers.

This publication serves as an invitation to researchers to follow up on these preliminary findings by carrying out further investigation of the area in which the random squares and the sites of the SAAS project are located. Survey-team

members welcome further investigation of the area and its sites.

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