



## A Risk Assessment for Cultural Heritage in Southern Iraq: Framing Drivers, Threats and Actions Affecting Archaeological Sites

Federico Zaina

To cite this article: Federico Zaina (2019) A Risk Assessment for Cultural Heritage in Southern Iraq: Framing Drivers, Threats and Actions Affecting Archaeological Sites, *Conservation and Management of Archaeological Sites*, 21:3, 184-206, DOI: [10.1080/13505033.2019.1662653](https://doi.org/10.1080/13505033.2019.1662653)

To link to this article: <https://doi.org/10.1080/13505033.2019.1662653>



Published online: 26 Sep 2019.



Submit your article to this journal [↗](#)



Article views: 2




View related articles [↗](#)



View Crossmark data [↗](#)



# A Risk Assessment for Cultural Heritage in Southern Iraq: Framing Drivers, Threats and Actions Affecting Archaeological Sites

Federico Zaina 

Department of History and Cultures, University of Bologna, Bologna, Italy

## ABSTRACT

This paper proposes a classification of the risks threatening archaeological sites in southern Iraq and suggests some possible remediation to better preserve them. This has been possible thanks to a research methodology that combines remote sensing and ground control on a sample of 558 sites documented by the Iraqi-Italian QADIS survey project. A three-tier typological framework has been created illustrating the risks jeopardising the cultural heritage of the region. This research showed that the most impacting risks are the ones caused by agricultural activity, despite current narratives which mainly focus on looting and violent destruction. To get at the root of the problem, current laws protecting cultural heritage in Iraq are analysed, as well as how the cultural authorities are organised on the ground. Improving the organisation of the SBAH, engaging the local communities towards the issue of sites' protection and introducing preventive archaeology are among the solutions proposed.

## KEYWORDS

Cultural heritage; risk assessment; protection strategies; landscape archaeology; Southern Iraq; archaeological sites

## Introduction

In recent decades risks and damage affecting the Iraqi cultural heritage has dramatically increased. The continuous outbreak of conflict from the 1980s until today, extensive looting, effects of natural erosion and silting processes, problems related to the construction of infrastructure, as well as the extension of farmland have all deeply impacted the archaeological sites throughout the country. The extent of these types of damage has been only partially understood and in-depth analyses and comprehensive reports have not yet been produced. Additionally, in the wake of the recent political events and ever-growing issue of climate change, both academic researchers and the global media principally have focused on threats and destruction caused by environmental processes or violent conflict to the cultural heritage, giving less prominence to other equally destructive threats (Lopez 2016). In particular, the looting of archaeological sites and museums, together with the bombing of monuments throughout the country have received extensive attention through both academic reports (Bewley et al. 2016; Danti 2015; Emberling and Hanson 2008; Isakhan 2014; Lippolis 2018; Otto et al. 2018; Rothfield 2008; Russell 2008; Stone 2008a, 2008b, 2015; P. Stone 2015) and more public-oriented papers (Frahm 2015; Harmanşah 2015; Munawar 2017; Jones

2018; Smith et al. 2016), spreading the perception that these are the most pervasive and dangerous damage to cultural heritage in Iraq.

In this context, the definition of the entire set of risks affecting archaeological sites and monuments in the country, that is the cornerstone for the study of endangered cultural heritage, is still far from being defined. In addition, while current research focuses on the documentation of specific types of risks (Curtis et al. 2008; Stovel 1998; Zerbini 2018, see also <http://eamena.arch.ox.ac.uk/>), few of them also attempt to identify both strategies to prevent these risks and target groups to be involved (Al Hamdani 2008; Al Quntar et al. 2015; Marchetti et al. 2018; Matthews et al. 2019).

Beginning with the current shortcomings, this paper analyses the reasons (drivers) triggering threats and the specific actions affecting archaeological sites in southern Iraq, with the aim of proposing a tentative multi-tier typological framework of the types of endangered archaeological heritage. It then outlines the most pervasive threats and actions with an understanding of the current legislation and strategies applied by local authorities to protect archaeological sites. In conclusion it proposes solutions to mitigate the current situation. This analysis has been done by using the data collected since 2016 in the frame of the Iraqi-Italian QADIS survey project directed by N. Marchetti of the University of Bologna (Marchetti et al. 2017, 2018, *forthcoming*), in the eastern part of the Qadisiyah region of Iraq.

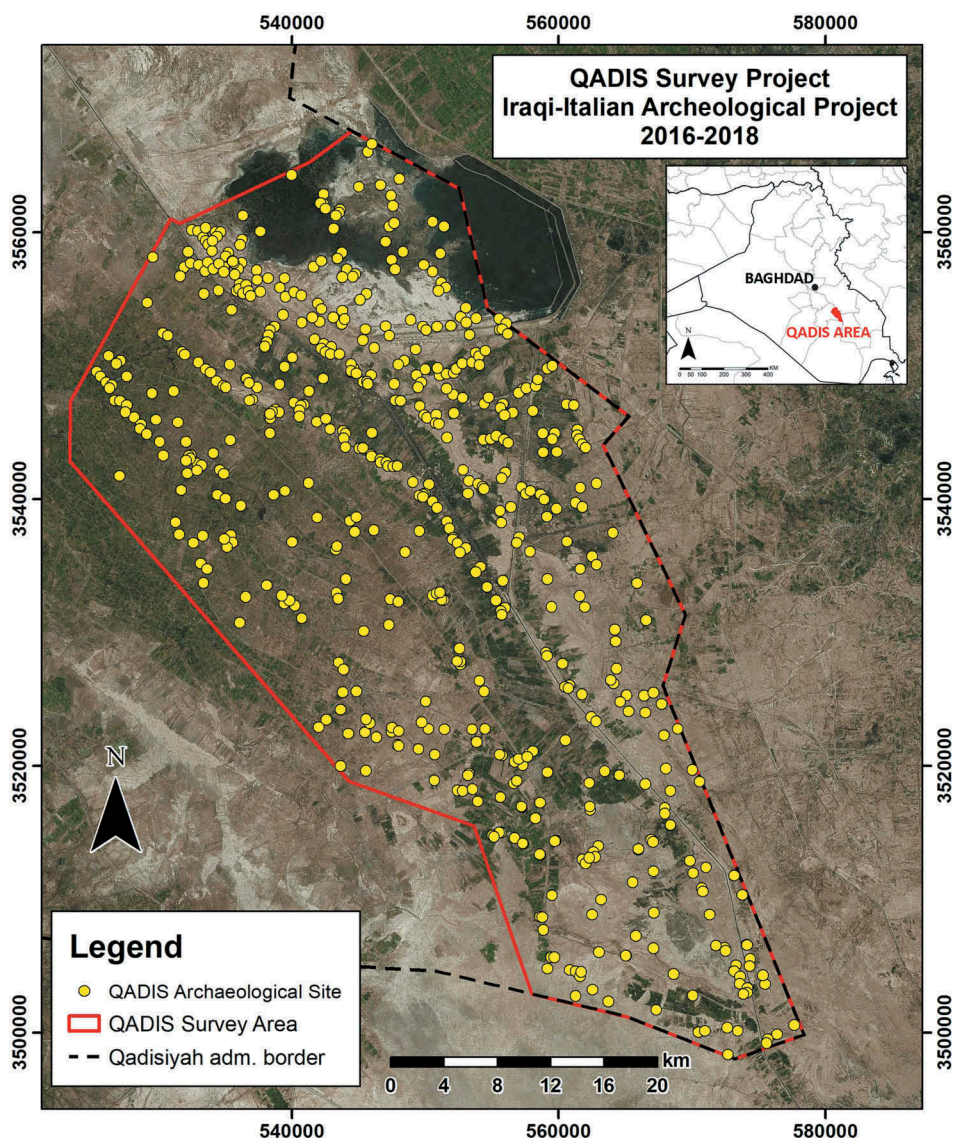
## **Documenting Threats to Cultural Heritage in the QADIS Survey Area: Aims and Methods**

### ***The QADIS Survey Area and Previous Research Therein***

The QADIS survey project is a joint Iraqi-Italian initiative led by the University of Bologna in collaboration with the State Board of Antiquities and Heritage of Iraq (SBAH) (Figure 1). The aim of this project is that of updating the understanding of the multi-layered historical landscape of a key region in the Mesopotamian alluvium, as well as of documenting the current risks and damage to the local cultural heritage (Marchetti et al. 2017, 2018, 2019). The selected area follows the administrative borders of the province of Qadisiyah to the south and east (including part of the Delmej basin), up to a line connecting the archaeological site of Fara/Shuruppak with the town of Afak to the west and north. The area investigated has been selected according to the following criteria:

- Ample available data about settlements and waterways distributed across the entire chronological range of the region;
- Presence of archaeological sites of different dimension (for small villages to large cities) for each chronological period;
- Evidence from new unrecorded sites to integrate into the existing dataset;
- A wide range of sites of different sizes and from different periods, with visible structures;
- Extensive destruction of archaeological sites.

As listed in greater detail by N. Marchetti (Marchetti et al. 2017, *forthcoming*), in addition to the 416 archaeological sites already documented by previous survey projects (Adams 1981; Adams and Nissen 1972; Al Shukri 1974; Dougherty 1926),



**Figure 1.** The QADIS survey area.

all located through remote sensing by us, during the six survey campaigns (from 2016 to 2018) the QADIS team has identified 142 new sites, while investigating 56 sites previously mapped.

### **Aims**

The study of the threats and damage to the local cultural heritage in the QADIS survey area represents one of the main scopes of the wider project (Marchetti et al. 2018, forthcoming). In particular, this study was underpinned by two main groups of research questions:

- What types of risks and damage affect archaeological sites in the QADIS survey area? Which ones have the most impact?
- Are the current legislation and the strategies applied by the local authorities to prevent or mitigate risks to cultural heritage comprehensive and effective? What kind of recommendations can be proposed to improve safeguarding of archaeological sites and management?

### ***Research Methodology***

In order to answer the first group of research questions, the two-fold methodology consisted of: 1) remote sensing in the survey area in order to identify the types of risk and damage affecting the archaeological sites; 2) ground survey of the evidence from satellite imagery to confirm or reject it.

This methodology has been successfully tested in recent years especially targeting those countries involved in war or political conflicts. In the Near East for example, archaeologists developed satellite imagery and ground truth analysis in Syria (Casana 2015; Casana and Panahipour 2014; Cunliffe 2014, 2016; Danti 2015; DGAM 2013), Egypt (Fradley and Sheldrick 2017; Parcak 2015; Parcak et al. 2016; Banks et al. 2017) and Iraq (Fisk 2008; Stone 2008a, 2015; Richardson 2011) among others.

Sources for remote sensing analysis consisted of different spatial datasets including historical and current satellite imagery, available through open-access online platforms and websites (Marchetti et al. 2017, forthcoming). By using the resulting base map, 558 archaeological sites in the region were analysed and types of risks and damage affecting them were defined. The preliminary evidence was then tested in ten selected sites through orthophotogrammetric survey carried out using UAVs (Marchetti et al. 2017, forthcoming).

In order to confirm the type of threats identified from remote sensing, ground control on a sample of 198 sites was carried out between 2016 and 2018 by the QADIS team. The site visits, consisting of the photographic documentation and mapping of all the visible damage as well as the gathering of information on potential forthcoming threats, confirmed the evidence hypothesised through remote sensing.

To answer the second group of research questions, the current national and international legislation protecting cultural heritage in Iraq was analysed in order to identify potential pitfalls. Moreover, the current organisation of the local SBAH officers in the eastern Qadisiyah region was considered, focusing on their spatial distribution in the region compared to the distribution of archaeological sites.

### ***Results: A Tentative Typology of Drivers, Threats and Actions***

The lack of literature or extended debate on the systematic identification of the types of risks affecting tangible cultural heritage and the motivations behind them with few exceptions (Brosché et al. 2017; Curtis et al. 2008; GHF 2010; Stovel 1998; Zerbini 2018) is a serious issue. The data collection presented in this article has shown a very diversified and complex situation. In this regard, it is noteworthy to point out that a comprehensive analysis of the state of preservation of cultural heritage cannot be limited to the assessment of risks and damage to the archaeological sites, rather it should address

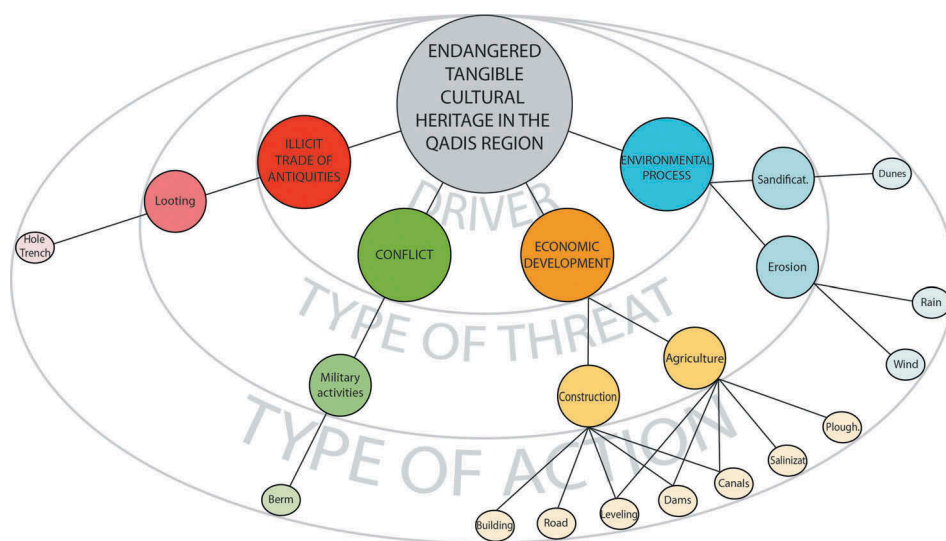


the reasons triggering them. The QADIS survey area provides an excellent environment to test this analysis, due to the high number of sites at risk or damaged.

Recent studies have defined the types of risk to cultural heritage according to a hierarchical framework, focusing first and foremost on the triggering factors, both human-caused (social, political, economic etc.) and environmental, and consequently various types of risks and concrete actions that these factors cause. One of the earliest attempts to systematically define risks to cultural heritage and propose policies to mitigate them was published by ICCROM (Stovel 1998) and provided a blueprint for cultural heritage experts for creating their own site-specific risk preparedness strategies (Jokilehto 2000). This manual, although extremely useful, was still focused on the environmental and armed conflict-related risks. Other similar attempts include the annual ICOMOS World Reports (ICOMOS 2000; Palumbo 2000) and the Global Heritage Fund reports (Fund 2010). Recently, P. Lopez (2016) proposed a typological framework of risks to cultural heritage identifying first 'risk factors' as environmental, socio-political, economic and managerial. To each of these corresponds a number of 'threats' such as armed conflict, construction, development and technological pressure and so on.

Based on the current literature and as a result of the collected data, a multi-tier framework was developed for the study of endangered archaeological sites, organised on three tiers (Figure 2). The first tier is presented by the *drivers*, based on Lopez (2016) risk factors. These can be defined as a condition, a necessity or a decision causing one or more subsequent processes (in our case the threats). In the case of the archaeological sites in the QADIS area, the main drivers triggering the threats include illicit trade of antiquities, conflict, economic development and environmental processes. The first three originate from human-made activities, while the fourth one falls within the environmental sphere.

Each of these drivers may cause a number of *threats* (2nd tier). These are defined as one or more risks generally related to one specific driver, even though often possibly



**Figure 2.** The three-tier framework of risk to archaeological sites in the QADIS survey area.

connected to more than one, and eventually generating a specific set of physically dangerous actions. For example, in the case of illicit trade of antiquities, the threat documented in the QADIS survey area is looting, while for conflict is military activity. Both economic development and environmental processes are more diversified, the former includes construction works or agricultural-related activities among others, while the latter comprises sandification or erosion.

The last (3rd) tier of this risks' typology is represented by the physical *actions* deriving from threats, meaning the tangible activities jeopardising the archaeological sites' preservation. In this regard, the analysis of the QADIS survey sites has revealed a great variety of actions connected to both construction and agriculture, while the actions related to the other threats are less variable.

In most cases, the archaeological sites may be affected by multiple drivers, threats or actions (Figure 2). It is important to underline that the number of drivers, threats and actions documented in the QADIS survey area cannot be fully representative of other regions, where more and different ones could be equally relevant. Threats not documented in the QADIS survey area include, among others, abandonment, geological processes or violent destruction that may lead to actions such as, without being limited to, earthquakes, bombing or mining. Our hope is that further research will enrich the framework through different case studies.

In the following paragraphs, risks and damage to the tangible cultural heritage within the QADIS survey area are described, according to the three-tiers framework (Figure 2). Human-made risks are described first, followed by environmental risks. For each one, the definition and the description of its tangible effect and impact on the archaeological sites are provided.

### ***Illicit Trade of Antiquities: Looting – Holes and Trenches***

Looting is an illegal activity consisting of the digging of trenches and pits on a site, to eventually to recover antiquities for sale on the international market (Brodie and Renfrew 2005; Proulx 2013). Looting is a threat that can be expedited and even fuelled by another major driver, that is conflict. It is the worldwide growing demand for antiquities which primarily leads to looting (Brodie 2006, 2008a, 2008b, 2011a) sometimes with the possible, even though indirect contribution of academic studies and publications of looted objects (Brodie 2011b). In the aftermath of the 2003 conflict, a dramatic increase in looting was observed, mostly in southern Iraq (Stone 2008a). With the stabilisation of the political situation, this phenomenon has greatly reduced, although it has not completely disappeared (E. Stone 2015; Marchetti et al. 2018).

In the QADIS survey area we have documented 185 sites (33.15% out of the total sample) pillaged by looters (Figure 4). The depth of the looting pits may vary greatly, down even to 8 m. Compared to the current urbanised landscape of the region, the distribution of looted sites shows that looters generally concentrate on those lying far from modern villages and towns, where the forces of law and order and the SBAH have a better control of the situation. The destruction is generally restricted to the upper parts of sites, although in most of the largest and best-known sites, also the lower town is targeted (Figure 3).



**Figure 3.** Extensive looting at Tell Abu Hatab/Kisurra (QD75b) documented by the QADIS survey project (October 2018).

### ***Conflict: Military Activities – Berms***

Military berms are the physical remains of the fighting positions during the Gulf wars, and are mainly documented in central-southern Iraq. In the QADIS survey area only two sites still have traces of these berms: Tell Drehem, ancient Old Babylonian (1800–1600 BCE) city of Puzrish Dagan and Tell Dlehim possibly associated with ancient Ur III (2100–2000 BCE) city of Tummam (Marchetti et al. 2017, *forthcoming*). Both sites are located close to the two biggest towns of the area (Akaf and Al-Bdeir), and along one of the main roads connecting the Qadisiyah region to the south. The orthophotogrammetric survey and the ground control have allowed identification of two types of berms, with either single or double space (measuring c. 16–17 m x 16–19 m). These structures could house armoured vehicles, including tanks. In order to build the earthen barriers, large portions of archaeological deposits were removed. In addition to this, the erection of the berms covered large sectors of the archaeological sites that now cannot be explored without removing those barriers.<sup>1</sup>

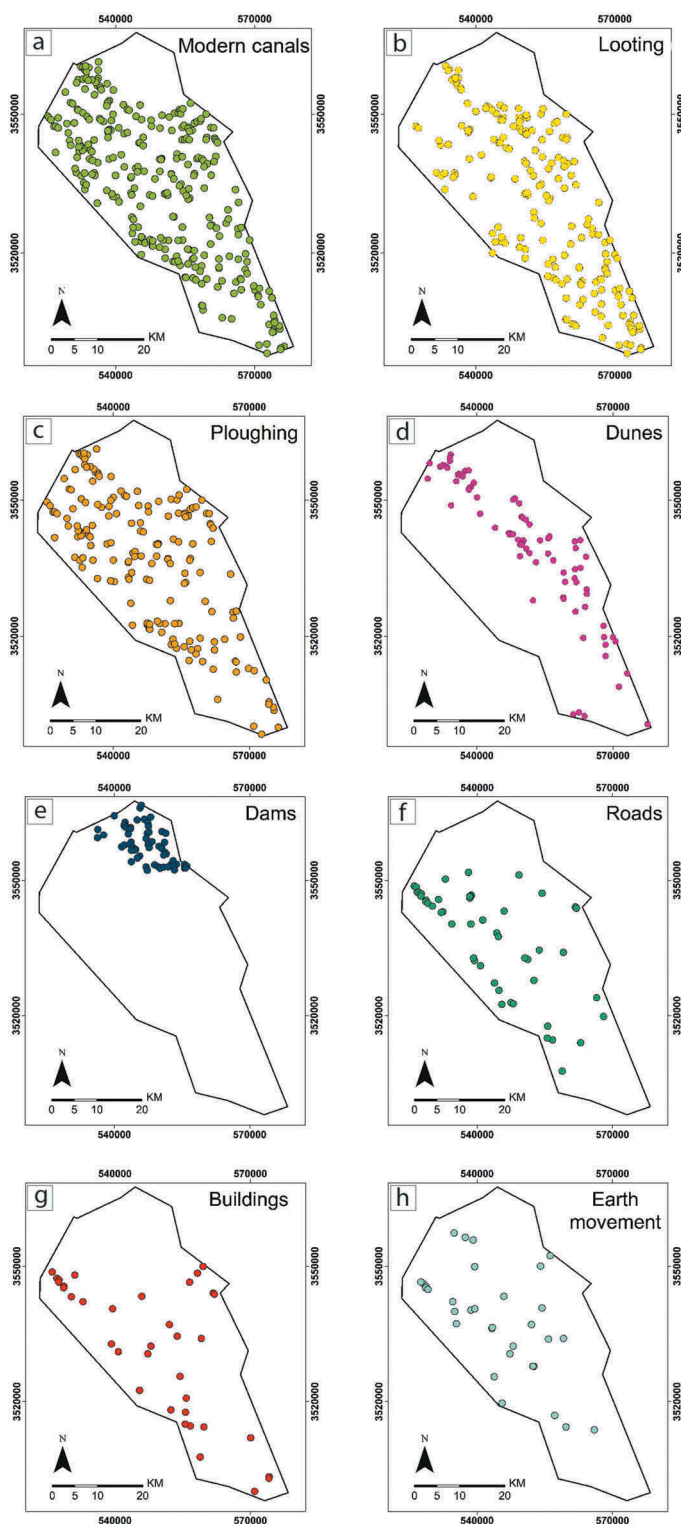
### ***Economic Development 1: Construction – Buildings***

The construction of buildings, including houses, commercial properties or industrial complexes, has a critical impact on cultural heritage. A considerable amount, or even the entire stratification, of an archaeological site can be removed, due to the cuts made to allocate the foundations. This is a widespread threat in the QADIS area, with no relevant spatial distribution patterns observed (Figure 4). In total, 38 sites (corresponding to 6.8% of the total sample) have been partially damaged by single buildings or by encroachment of villages and towns.

### ***Economic Development 2: Construction – Roads***

The construction of roads differs from that of buildings in terms of impact on the archaeological sites. Building roads over sites means removal of at least the top soil deposit and the





**Figure 4.** Distribution of the archaeological sites according to eight mostly impacting types of actions: (a) Canalisation (301 sites, 53.9%); (b) Looting holes (185 sites, 33.5%); (c) Ploughing (173 sites, 31%); (d) Dunes (81 sites, 14.5%); (e) Water reservoirs/Dams (61 sites; 10.9%); (f) Road (50 sites; 8.9%); (g) Buildings (37 sites, 6.8%); (h) Earth movement (33; 5.9%).

uppermost archaeological layers and generally replacing it with tarmac. As a result, the underlying archaeological levels are sealed, compressed and potentially crushed by the asphalt machines, and subsequently by the means of transport. Additionally, the remaking of the road surface can cause further damage over time. In the QADIS area, we have documented 50 sites (corresponding to 8.9% of the total sample) cut by one or more tarmac roads (Figure 4). The spatial distribution of archaeological sites damaged by road construction does not show any particular trend except for the fact that most of the sites are located along the main arterial road of the region (road no. 17).

### ***Economic Development 3: Construction – Earth movement/Levelling***

Earth movement or levelling are among the physical results of the construction activities and consists of the movement of earth, by using bulldozers or other earth-moving machinery, with the aim of creating features (like ditches, embankments or walls) or levelling ground to allocate structures. This action may significantly alter the archaeological deposits. We have documented 33 archaeological sites (corresponding to 5.9% of the total sample) in the QADIS survey area impacted by this action (Figure 4). According to the ground control, in most cases the damage consists of the levelling of the low mounds' borders by bulldozers in order to increase the available farmland.

### ***Economic Development 4: Construction/Agriculture – Dams and Water Reservoirs***

The impact of dams and the resulting water reservoirs on cultural heritage is enormous, affecting thousands of sites worldwide (Cunliffe, de Gruchy, and Stammitti 2012; Marchetti et al. 2019). The development of these massive infrastructures represents another type of action resulting from construction, as well as from agricultural activities. This is the case of the Delmej reservoir (one-third (almost 210 km<sup>2</sup>) of which is included in the north-eastern part of the QADIS survey area). This massive hydraulic infrastructure (616 km<sup>2</sup> in total) was part of an economic development project, between the late 1960s and early 1970s, in an area where the strong desertification and lack of immediately accessible waterways prevented the growth of agricultural and pastoral industries. The project analysed the impact of the Delmej reservoir on cultural heritage through time, by using a multi-temporal satellite-based analysis. The results have revealed that the slow up-filling of the reservoir, that started in the late 1960s, ended up with the complete flooding of the area (and the archaeological sites) around the mid-1980s (Marchetti et al. 2018, 2019). However, the analysis of satellite imagery, taken in different seasons of the year, has shown that several sites are still visible in dry periods, although they are heavily eroded. In order to document the state of preservation of some of the visible sites, the SBAH carried out rescue excavations at four sites, between 2011 and 2013.

The integration of the archaeological data emerged from the surveys made before the reservoir up-filling (Adams 1981; Adams and Nissen 1972) with the satellite imagery, allowed to identify 146 archaeological sites flooded by the Delmej reservoir, 61 of which (corresponding to 10.9% of the total sample), of different periods and dimensions, within the QADIS survey area (Figure 4). Ground control has been used, in order to assess the state of preservation of the sites still visible in dry periods. The visits at the sites have confirmed the loss of large portions, as well as the dislocation of stratified

material culture, due to water erosion. Remarkably, despite the wealth of collected data on the heritage of the area affected by the dam (Adams 1981), no post-flooding assessments have been performed by archaeologists, to determine the degree of destruction caused by the Delmej reservoir (Marchetti et al. 2018, *forthcoming*).

### ***Economic Development 5: Construction/Agriculture – Modern Canals***

The use of canal systems for irrigation or navigation has been a practice in Iraq for millennia (Pournelle 2013; Wilkinson 2003; Wilkinson, Rayne, and Jotheri 2015). To date, the alluvial plain of central-southern Mesopotamia is a complex and intricate system of canals. Depending on the function and, in the case of agricultural intervention, on the area to be cultivated, the depth and width of the canals vary from a few dozen cm to several metres. Excavating canals causes not only the removal of archaeological deposits, but the archaeological soil spreading following their removal can also seal or affect other deposits that have no connection with the former. Dumps located outside of the archaeological site can cause wrong or misleading archaeological interpretations.

Very often, the materials emerged from the excavation, that lie along the banks or at the bottom of the canal, can be transported by the stream of the canal even for several kilometres. This type of hydraulic infrastructure represents the most dangerous threat to archaeological sites, documented in the QADIS area (Figure 4). The analysis of the satellite imagery coupled with ground control allowed the project to identify 301 sites throughout the region (corresponding to 59.9% of the total sample) cut by canalisation.

### ***Economic Development 6: Agriculture – Salinization***

Soil salinity has become one of the major problems for crop production and food security in Iraq (Wu et al. 2014a, 2014b). Indeed, excessive irrigation and poor drainage conditions are the major factors contributing to rising groundwater tables and soil salinity in the irrigated areas of the country (Qureshi, Waqas, and Al-Falahi 2013; Wu et al. 2014b). This phenomenon may also have a substantial impact on the archaeological sites due to irrigation and ploughing. However, the spread of soil salinization over sites has never been systematically documented, although archaeologists have recognised it sometimes as a risk (Pollock 1990) and other times as a useful soil condition to detect ancient structures (Stone 2014). The analysis of the QADIS survey area has revealed that 17 sites (corresponding to 3.2% of the total sample), randomly distributed throughout the region, are partially endangered by salinization.

### ***Economic Development 7: Agriculture – Ploughing***

The construction of water infrastructures in the northern part of the region since the 1980s and the consequent increase of farmland have heavily damaged the archaeological heritage. In addition to affecting numerous sites previously identified during surveys in the 1960s and 1970s (Adams 1981; Adams and Nissen 1972), the extensive cultivations brought to light new sites that had disappeared below the thick alluvial deposit. Furthermore, there is a remarkable difference between the old methods of ploughing, creating relatively shallow furrows and only employed in flat areas, and the

modern systems including tractors and other machines, able to exploit even the high and steep mounds where the majority of archaeological deposit is concentrated. The QADIS project, in collaboration with the local SBAH, has mapped 173 sites (corresponding to 31%), partially or totally damaged by ploughing (Figure 4). As in the case of the construction of modern canalisation, the spatial distribution of archaeological sites affected by ploughing is widespread and it does not show any clear pattern.

In some cases, it was necessary to use more detailed survey methods, due to the difficulty in distinguishing between the archaeological sites and the off-site scatter. This was the case of the group of sites named QD117. The satellite imagery revealed some pseudo-circular (referable to archaeological sites) or elongated (related to paleochannels) anomalies of brownish colour. High-resolution orthophotographic mapping carried out with UAVs provided a more detailed picture of the area and gave hints on the location of the sites affected by agricultural activities (Marchetti et al. 2018, 2019). The final step consisted of the intensive collection of surface materials from the same area (measuring about 1.24 km x 0.76 km, extending for approximately 90 ha), that allowed us to isolate three main clusters of materials, dating from the fourth to the third millennium BCE and indicating the presence of sites. After the definition of the archaeological areas, the data were crossed with the current extension of the ploughed area and the associated canal grid. The result has showed that 100% of the archaeological area is damaged by modern agricultural works. Moreover, ploughing has affected about the first 30 cm of the archaeological deposits, while the excavation of canals has damaged up to 3 m of the archaeological deposit in two out of three sites. This method has proven effective in flat sites, not directly visible and thus potentially more vulnerable.

### ***Environmental Process 1: Sandification – Shifting Dunes***

Over the past 60 years, massive investments in the development of new irrigation channels in the region have strongly changed the previously desert or semi-desert territory, creating large areas of farmland. However, there are still mainly desert areas characterised by sand dunes of variable size. Dunes cover the surface of the sites and then slowly move forward, due to the wind blowing. In this way, they do not damage the sites, but make them inaccessible for an undetermined period. In the QADIS survey area we documented 81 archaeological sites (corresponding to 14.5%) partially or totally covered by dunes (Figure 4). These sites are principally clustered along the ancient Euphrates and Tigris paleochannels.

### ***Environmental Process 2: Erosion – Rain and Wind***

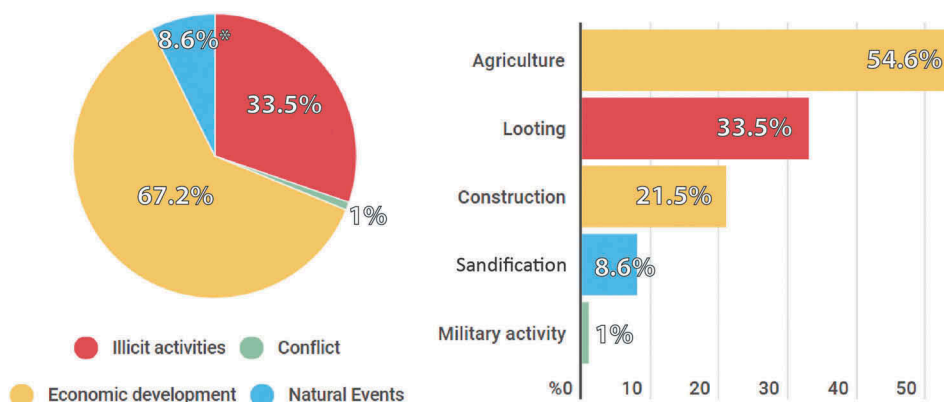
Erosion is a natural process resulting from the action of wind or rain daily affecting the surface of the sites. This process can lead to the gradual wearing away either of a site or of the ground itself, revealing previously buried parts of a site. Alternatively, a site can be buried, due to the action of eroded earth from elsewhere. Erosion is a process commonly seen in the QADIS survey area, visible in 100% of the sites. Due to its pervasiveness, this type of threat is quite difficult to be systematically analysed and studied. For this reason, it will not be considered in the discussion on the threats' impact.

## Analysis: The Impact of Drivers, Threats and Action in the QADIS Area

In the light of the three-tier framework developed, what are the most impactful types of risks and damage affecting archaeological sites in the QADIS survey area? Analysis of the 558 archaeological sites in the QADIS survey area has provided interesting insights on the current state of preservation of these heritage areas and the different types of drivers, threats and actions affecting and jeopardising them.

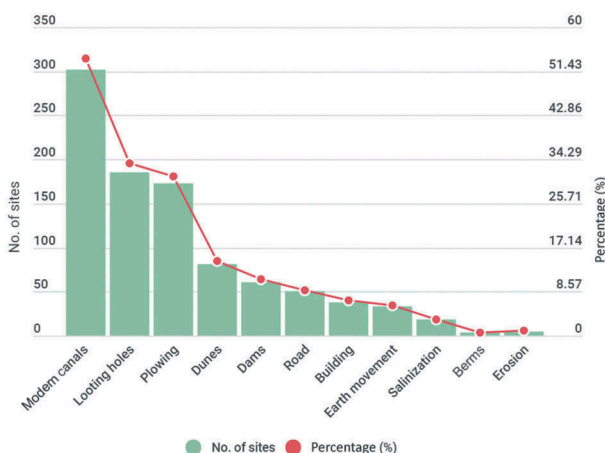
Economic development represents the highest impact driver, affecting 67.2% (375) of archaeological sites (Figure 5). One third of the total sample suffered from major damage due to threats and actions related to the illicit trade of antiquities (33.5%, 185 sites), while environmental processes and conflicts have been observed respectively in 8.6% and 1% of sites. The analysis has shown that the most impacting driver is economic development, although great emphasis has been placed so far, by both academics and media, on the destruction of archaeological sites and monuments in the Near East caused by violent conflicts and/or looting. In this regard, it is noteworthy that international institutions including Global Heritage Fund (2010) and UNESCO (2015), among others, have often, although briefly, emphasised the issue of economic development (Lopez 2016).

Among the different type of threats, agriculture affects 54.6% of the archaeological sites, while looting 33.5% and construction works 21.5% (Figure 5b). The phenomenon of looting is generated from the illicit request for antiquities, although a substantial support is also given by the unstable political situation. The process of reconstruction of the country and its albeit slow political stabilisation have reduced the phenomenon of looting in the last decade, as confirmed by numerous studies concerning both the destruction of sites (Stone 2008a, 2015; Marchetti et al. 2018, forthcoming) and the illegal trafficking of antiquities (Brodie 2006, 2008a, 2008b, 2011a). On the contrary, the agricultural exploitation of the land and the growing urbanisation, not only in the main centres but also in the peripheral areas of the region, if not properly developed and



**Figure 5.** Percentage of archaeological sites at risk according to the types of drivers (a) and threats (b) documented in the QADIS project survey area. \*means that erosion has not been considered in the calculation due to its pervasiveness, which makes it difficult to be systematically analysed and studied.





**Figure 6.** Breakdown graph of the absolute number (left) and percentage (right) of archaeological sites affected by different types of actions in the QADIS project survey area.

coordinated with current laws and the authorities, may represent a problem that will increase over time, threatening a growing number of archaeological sites.

Concerning the single actions (Figure 6), canalisation represents the most damaging one (53.9%) followed by the digging of looting holes and trenches (33.15%), ploughing (31%) and dunes (14.5%), while the rest of the actions generally affect less than 10% of the sites. In this regard, it is noteworthy how on the one hand actions affecting cultural heritage in the long-term such as canalisation and ploughing as well as the construction of roads and buildings are placed at the top positions and represent the most increasing issue.

## Current Legislation on Managing Sites and Preventing Risks to Cultural Heritage

Considering the situation described in the previous paragraphs, what are the current protective legislation and strategies applied by local authorities to prevent or mitigate the abovementioned risks to archaeological sites? In this paragraph I provide an overview on the current organisation of official heritage institutions in Iraq and the types of threats and actions considered by the national and international legislation on the safeguarding of heritage.

According to Articles 35 and 113 of the Iraqi Constitution (2005, at [https://www.constituteproject.org/constitution/Iraq\\_2005.pdf?lang=en](https://www.constituteproject.org/constitution/Iraq_2005.pdf?lang=en)), antiquities are protected by federal authorities in collaboration with regions and governorates. However, the concrete role of these authorities is still under debate (Davis 2014).

The SBAH, is the official Iraqi national institution in charge of preserving and managing the national heritage sites and the national museums. It was established in 1923 as part of the Ministry of Culture, Tourism and Antiquities and has been in action since 1936 (Ministry of Information 1936) in compliance with Antiquities Law No. 59 then amended in 1974 (n. 120) and 1975 (n. 164). In 2002 (Ministry of Tourism and Antiquities), Law No.55 for the Antiquities and Heritage of Iraq was issued, replacing

the previous ones. The SBAH has a Director General seated in Baghdad, while each governorate is run by a local director. Below the directors are the inspectors in charge of managing a sector of the region. A further level in the SBAH hierarchical framework consists of guards or keepers supervising a single site and often coordinated by chief keepers controlling two or more keepers. The number and distribution of inspectors, keepers and chief keepers may vary from governorate to governorate. Moreover, the SBAH officials are assisted in their daily activities by archaeological police, specifically trained.

With regards to the framework of risks presented in this research, the current legislation – Law No. 55 (Ministry of Tourism and Antiquities 2002) – provides substantial guidelines for protecting archaeological sites. The prohibition for any private or public entity to manipulate or destroy archaeological sites or heritage monuments is clearly specified in Article 3.2 which states: ‘the owner of a land where an immovable Antiquity is, shall not have the rights to dispose, dig, vandalize or change the features on or under the soil’. This first statement is then supported by Article 5.3, mentioning the necessity of a buffer zone around sites and monuments to prevent encroaching.

According to the law, local communities should also participate in the process of safeguarding and documentation of archaeological sites and heritage buildings. Among others, as specified by articles 7, 12 and 19, anyone who is aware of the presence of an archaeological site on their land must register it with the authorities within 24 hours.

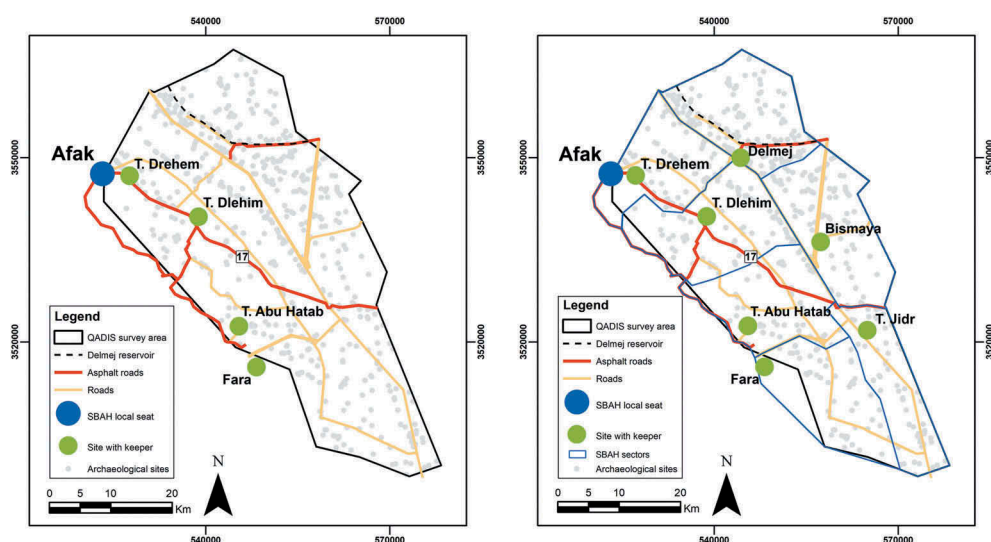
Going specifically to the threats, a first reference to environmental damage is made in Article 2.3 which mentions the necessity of restoration works to prevent erosion and deterioration of archaeological sites, heritage buildings and artefacts. But the most comprehensive and detailed guidelines for heritage preservation are resumed in Articles 9 and 15. The former (Ministry of Tourism and Antiquities 2002, Paragraph 9.3) states that ‘The concerned authorities shall be committed to conserve the Antiquity, Heritage and Historical Sites when the mentioned authorities are about to make state industrial, agricultural or residential projects and other projects like: city and the village planning, beautification, expansion, irrigation canals and the road paving ...’. Further restrictions on the permission to use land where archaeological sites or heritage buildings are located can be also found in Articles 9.5 and 9.6. Article 15 lists a series of prohibitions, including: to cultivate or build (15.2, 15.3, 15.5), to remove anything from the archaeological sites (15.4) and to damage archaeological sites and monuments (15.6). Article 17 stresses and makes the question of the illegal possession of antiquities linked to looting activities even more bitter. The penalties and fees for contravening the abovementioned articles are listed in Articles 38 to 50.

In addition to the national legislation, Iraq has also ratified international protocols to strengthen the protection of its own heritage, such as the 1954 Protocol to the Convention for the Protection of Cultural Property in the Event of Armed Conflict (UNESCO 1954, but without ratifying the second protocol, see Matthews et al. 2019; Van Heese 2010), the 1970 Convention on the Means of Prohibiting and Preventing the Illicit Import, Export and Transfer of Ownership of Cultural Property (UNESCO 1970) and the 1972 Convention concerning the Protection of the World Cultural and Natural

Heritage (UNESCO 1972). Therefore, on paper, the current legislation seems to adequately protect archaeological sites and monuments of the country.

The area considered by this study is controlled by a SBAH office in the town of Afak. The office is managed by a local inspector headed by the regional director, located at the Diwaniyah headquarters. The local inspector supervises several guards or keepers appointed in some of the main archaeological sites of the area or immediately outside it. To be more precise, there are guards or keepers protecting the sites of Tell Drehem/Puzirsh Dagan, Tell Dlehim/Tummal, Tell Abu Hatab/Kisurra and Fara/Shuruppak (Figure 7a). The latter, although located outside the targeted area, is close to many sites within it and its inclusion is useful for the final discussion and suggestions. Figure 7(a) shows how the distribution of the SBAH personnel in this part of the region is uneven. It must also be pointed out that the local road system mainly consists of dirt roads (some of which are only used seasonally), while the few asphalt roads connect only some parts of the region, thus making it difficult to reach the sites. In light of this, the main issues raised are the following:

- There is an overconcentration of SBAH personnel in the north-western part of the region, while there are no SBAH seats or guarded sites east of state road 17.
- Protection and management are mainly focused on a few large archaeological sites, while less attention is paid to smaller ones.
- Given the high number of archaeological sites and the relatively low number of SBAH officers, it is unlikely that the SBAH personnel would be able to efficiently protect all the sites, even in the areas where local seats are present.
- Although the current legislation seems to adequately define the allowed relationships of the citizens with the archaeological sites, there seems to be no compliance with these laws. It remains to be understood if this is due to the lack of knowledge or not satisfying application of current legislation.



**Figure 7.** Current distribution of SBAH inspector and guards/keepers in the QADIS area (a) and the new proposal (b).

## Conclusion: Improving Cultural Heritage Management, the QADIS Survey Area

By understanding 1) the current types of risks affecting the cultural heritage in the QADIS region and 2) the current legislation and main strategies put in place by local SBAH officers, and their pitfalls, this paper proposes a few suggestions to contribute to the improvement of cultural heritage management and safeguarding in the region.

The main problems that emerged concern human-made drivers and threats. Physical actions such as canalisation, ploughing, road and building construction, when carried out at archaeological sites without official permission, are punished by law, but apparently there is a lack of implementation. The case of looting is instead different: this is a deliberate criminal action with a clear geographical pattern. In order to prevent the current threats and actions, tailor-made strategies addressing the different target groups involved, official institutions and local communities, must be implemented.

Given the shortcomings arisen from our analysis it is suggested:

- (1) DOCUMENTATION OF THE LOCAL HERITAGE. The creation of a regional archaeological risk assessment map, based on international standards, would be extremely useful in providing a clear and concrete picture of the current regional heritage. An open access WebGIS would maximise the distribution of the map through the internet and it would be available to academics and the wider community. Such tools would allow local authorities to plan and apply ad hoc strategies to address each type of risk. In this regard, the creation of an open access WebGIS (ArchIraq) including the archaeological sites of central and southern-Iraq is currently ongoing in the frame of the EU-funded EDUU project. A similar approach has also been proposed by the EAMENA project but focusing on the endangered sites. Elsewhere in the region an attempt to make available a WebGIS including the national archaeological sites has been developed by the Directorate General of Jordan through the MEGA-Jordan project <http://megajordan.org/>.
- (2) DECENTRALISATION OF SBAH OFFICERS. The organisation and distribution of the SBAH personnel over the QADIS area should be improved. This could be reached through a more decentralised and capillary distribution of the SBAH inspectors, guards and archaeological policemen across the region. An efficient reorganisation should take into consideration variables like 1) quality of roads to reach the sites in less time; 2) number of sites; 3) presence of large sites with already available personnel; 4) presence of towns/villages to create further small SBAH offices (Figure 7b). In particular, I propose a two-step process: 1) The first step aims at filling the gap in the guards/keepers distribution in the eastern part of the region, focusing on the largest and most important sites. Therefore, the mega-sites of Bismaya/Adab and Tell Jidr/Karkar which have suffered heavily from looting, canalisation and ploughing will be protected by SBAH officers. This first step will allow the new guards/keepers to assure a better protection of the sites as well as to get confident with the surrounding region. 2) The second step will aim at protecting all the sites of the region. Considering the shape of the QADIS area, the distribution of the current seats as well as those set up during step 1, the

region may be divided into seven sectors, each one with its own site/place as a hub where a chief keeper and one or more guards/keepers are located (Figure 7b). The division of the region is based on the above-mentioned variables. Particularly, the number of sites included in each region (Table 1) should mostly depend on the road accessibility. In addition to the four existing seats and the two seats created during step 1, a seventh would be added to protect the Delmej region and in order to minimise the investment could be located at the local police seat currently located at the Delmej bridge.

A better distribution of SBAH officers in the territory will allow for the reduction, or even stopping of looting activities that take place far from the main centres. It will also allow a more constant and careful monitoring of site preservation. A decentralization of inspectors, guards/keepers and chief keepers in the territory could also favour closer contacts and dialogue with the population, encouraging them to understand the cultural relevance of the archaeological sites, thus helping to reduce the effect of threats such as canalisation, ploughing, road and building construction.

- (3) IMPROVING LEGISLATION. As stressed by recent studies (Matthews et al. 2019; Van Heese 2010) it is important for the government of Iraq to ratify the 1999 Second Protocol to the 1954 Hague Convention (UNESCO 1999). This protocol provides a number of benefits, including technical and funding assistance as well as the improvement of the legal protection. As illustrated by Matthews et al. (2019), article 5 of the Second Protocol provides a further step in the protection and safeguarding of cultural heritage by obligating safeguarding measures such as the preparation of inventories, and emergency plans as well as *in situ* protection for cultural property. Such improvements – if implemented – would be critical for protecting sites from future drivers, threats and actions such as violent destruction and looting.

Moreover, the persistent lack of funding affecting Iraqi cultural heritage authorities would be partially healed by access to The Fund for the Protection of Cultural Property in the Event of Armed Conflict, established under article 29 (UNESCO 1999). This would first improve security features at sites, or improve risk management planning, however I also suggest to extend its use in order to allow the implementation of the decentralization of SBAH as suggested in point 2. In addition, articles 10 and 32 grant the possibility for sites to receive Enhanced Protection status. This would encourage increased investment for their protection in the event of a conflict. Although Iraq has not always adequately applied or enforced its existing legislation,

**Table 1.** Number of sites per SBAH sector according to the new proposal (61 sites flooded by the Delmej reservoir have been excluded from this list).

SBAH Sector	No. of sites
1 Tell Dreheim/Puzrish Dagan	82
2 Tell Dlehim/Tummal?	76
3 Tell Abu Hatab/Kisurra	59
4 Fara/Shuruppak	56
5 Delmej	77
6 Bismaya/Adab	79
7 Tell Jidr/Karkara	68



ratifying the 1999 Second Protocol could act as an indicator of increasing commitment to doing so.

- (4) **PRIVATE SUPPORT FOR DOCUMENTATION AND SAFEGUARDING.** A step forward in the documentation and safeguarding of archaeological sites could also come from private initiatives supported by the official bodies. In this regard, the introduction of preventive archaeology in Iraq can provide a sustainable system for avoiding the destruction of sites due to ploughing, canalisation, road and building construction among others, thanks to controlled excavations carried out by private companies supervised by the SBAH officer (Marchetti et al. 2018). In the past thirty years, professional private archaeological companies have emerged in Europe as a response to the urgent need of archaeological surveys and excavations before starting construction works or other activities entailing land exploitation. The excavations were previously organised mainly by academic institutions; then, since 1980 onwards, preventive archaeology companies led by private enterprises appeared in western Europe (Bozóki-Ernyey 2007; Demoule 2012; Novaković et al. 2016). A recent overview has estimated that currently preventive archaeology, mostly carried out by private companies, represents almost 90% of total excavations in Europe (Demoule 2012). The growing success of preventive archaeology also contributes to increasing public awareness of the importance of cultural heritage (Demoule 2012).

I suggest implementing the workflow recently proposed by Marchetti et al. (2018) for the introduction of preventive archaeology in Iraq.

Notwithstanding the presence of legislations, local people keep on destroying sites, thus suggesting that they are unaware of the laws and they have no interest in archaeological sites. The pervasive human-made destruction documented and the analysis of current legislation suggested that local communities, from families to community leaders, need to be made more aware of the importance of their local heritage and the existing laws protecting it.

- (1) **RAISING AWARENESS OF HERITAGE.** Local institutions should raise awareness of the importance of heritage among local people through cultural events and activities at any level. Similar approaches fall in the sphere of community archaeology (Marshall 2002; Moser et al. 2002; Moshenska and Dhanjal 2011) and have been recently tested in the frame of the Iraqi-Italian joint EU-funded EDUU project (<http://www.eduu.unibo.it>) thanks to different types of activities, including the organisation of interviews to understand the current perception of the local people towards heritage, the creation of childrens comic books, the organisation of visits to sites and museums and the creation of cultural spaces (i.e. museum) to promote local heritage among others.
- (2) **COMPLIANCE WITH EXISTING LAWS ON HERITAGE.** The community should be informed by local SBAH officers about the current laws protecting heritage through meetings and events. In this way numerous types of threats such as intense agricultural exploitation, canalisation, private construction activities and looting would be reduced.

These suggestions should be considered as part of a more solid plan for the sustainable protection and communication of archaeological sites to be developed by archaeologists, local authorities and communities (Matthews et al. 2019; Teutinico and Palumbo 2000). Indeed, a closer engagement of archaeologists beyond the academic research, in the issue of site preservation and communication of archaeological sites and cultural landscapes actively involving local parties at any level has become mandatory.

## Note

1. The US army has only recently developed regulations to avoid the removal of archaeological deposits especially when filling sandbags and HESCO barriers. The use of HESCO barriers would be particularly recommended instead of employing berms or digging trenches (<https://www.cemml.colostate.edu/cultural/09476/chp04-01iraqenl-c.html#engineering>).

## Acknowledgements

I wish to thank Nicolò Marchetti for his support and fruitful critique to the present paper. The QADIS survey project is a joint Iraqi-Italian initiative by the Alma Mater Studiorum - University of Bologna and the State Board of Antiquities and Heritage (SBAH): six campaigns have been carried out between 2016 and 2018 under the direction of N. Marchetti. The friendly and unfailing cooperation of the Chairman of the State Board of Antiquities and Heritage, Qais Hussein Rasheed, and the other colleagues at the SBAH in Baghdad, Diwaniyah and Afak are here gratefully acknowledged. Thanks are also due to Giulia Scazzosi (Museo della Scienza e della Tecnologia, Milan) and Emma Cunliffe (University of Newcastle) for their precious comments and critique.

## Disclosure Statement

No potential conflict of interest was reported by the author.

## Funding

Funding for the six survey seasons was provided by the Alma Mater Studiorum – University of Bologna, the Italian Ministry of Foreign Affairs (DGPS directorate – 6th Office) and the European Union funded project EDUU - Education and Cultural Heritage Enhancement for Social Cohesion in Iraq <http://www.eduu.unibo.it> (EuropeAid CSOLA/2016/382-631) coordinated by N. Marchetti at the University of Bologna. Part of the results provided in this research (i.e. the analysis of archaeological sites flooded by the Delmej reservoir) stem from the Bologna research unit on dams ([www.orientlab.net/orientdams](http://www.orientlab.net/orientdams)) directed by N. Marchetti within the EU Horizon 2020 JPIC project HeAT. Heritage and Threat (2015-2018) coordinated by I. Thuesen at the University of Copenhagen.

## Notes on Contributor

**Federico Zaina** is a research fellow in Archaeology of the Ancient Near East at the University of Bologna (Italy). As a field archaeologist he took part in excavation campaigns in Italy, Albania, Syria, Turkey and Iraq. He is currently a team member of several EU-funded projects including the JPIC Heritage and threat on the documentation of endangered archaeology in the Near East, the Erasmus+ Capacity Building WALADU on archaeology curricula development in Iraqi universities and the EuropeAid EDUU for education and cultural heritage enhancement in Iraq. His main

research interests concern the study of endangered cultural heritage in the Near East, landscape archaeology and the study of material culture in southern Iraq and southern Turkey.

## ORCID

Federico Zaina  <http://orcid.org/0000-0003-1525-1462>

## References

- Adams, R. M. 1981. *Heartland of Cities. Surveys of Ancient Settlement and Land Use on the Central Floodplain of the Euphrates*. Chicago: Oriental Institute.
- Adams, R. M., and H. J. Nissen. 1972. *The Uruk Countryside. The Natural Setting of Urban Societies*. Chicago: Oriental Institute.
- Al Hamdani, A. 2008. "Protecting and Recording Our Archaeological Heritage in Southern Iraq." *Near Eastern Archaeology* 71: 221–230. doi:10.1086/NEA20697192.
- Al Quntar, S., K. Hanson, B. I. Daniels, and C. Wegener. 2015. "Responding to a Cultural Heritage Crisis: The Example of the Safeguarding the Heritage of Syria and Iraq Project." *Near Eastern Archaeology* 78: 154–160. doi:10.5615/neareastarch.78.3.0154.
- Al Shukri, S. J. 1974. "Archaeological Survey in the Region of Afak Area." *Sumer* 30: 297–309.
- Banks, R., M. Fradley, J. Schiettecatte, and A. Zerbini. 2017. "An Integrated Approach to Surveying the Archaeological Landscapes of Yemen." *Proceedings of the Seminars for Arabian Studies* 47, 9–24.
- Bewley, R., A. Wilson, D. Kennedy, D. Mattingly, R. Banks, M. Bishop, J. Bradbury, et al. 2016. "Endangered Archaeology in the Middle East and North Africa: Introducing the EAMENA Project." In *CAA2015. Keep the Revolution Going: Proceedings of the 43rd Annual Conference on Computer Applications and Quantitative Methods in Archaeology*, edited by S. Campana, R. Scopigno, G. Carpentiero, and M. Cirillo, 919–932, Oxford: Archaeopress Archaeology.
- Bozóki-Ernyey, K. 2007. *European Preventive Archaeology. Papers of the EPAC Meeting, Vilnius 2004*. Budapest: National Office of Cultural Heritage.
- Brodie, N. 2006. "Iraq 1990–2004 and the London Antiquities Market." In *Archaeology, Cultural Heritage, and the Antiquities Trade. (Cultural Heritage Studies)*, edited by N. Brodie, M. M. Kersel, C. Luke, and K. W. Tubb, 206–226. Gainesville: University Press of Florida.
- Brodie, N. 2008a. "The Western Market in Iraqi Antiquities." In *Preventing Looting in Wartime: Learning from the Lessons of Iraq*, edited by L. Rothfield, 63–74. Walnut Creek: Alta Mira.
- Brodie, N. 2008b. "The Market Background to the April 2003 Plunder of the Iraq National Museum." In *The Destruction of Cultural Heritage in Iraq*, edited by P. G. Stone and J. Farchack Bajjaly, 41–54. Woodbridge: Boydell Press.
- Brodie, N. 2011a. "The Market of Iraqi Antiquities 1980–2009 and Academic Involvement in the Marketing Process." In *In Crime in the Art and Antiquities. World Illegal Trafficking in Cultural Property*, edited by S. Manacorda and D. Chappell, 117–133. New York: Springer.
- Brodie, N. 2011b. "Scholarship and Insurgency? The Study and Trade of Iraqi Antiquities." In *Illicit Traffic of Cultural Objects: Law, Ethics, and the Realities. An Institute of Advanced Studies Workshop, 4–5 August 2011*. Crawley: University of Western Australia. <https://traffickingculture.org/app/uploads/2015/02/Brodie-2011-Scholarship-and-insurgency.pdf>
- Brodie, N., and C. Renfrew. 2005. "Looting and the World's Archaeological Heritage: The Inadequate Response." *Annual Review of Anthropology* 34: 343–361. doi:10.1146/annurev.anthro.34.081804.120551.
- Brosché, J., M. Legné, J. Kreutz, and A. Lija. 2017. "Heritage under Attack: Motives for Targeting Cultural Property during Armed Conflict." *International Journal of Heritage Studies* 23: 248–260. doi:10.1080/13527258.2016.1261918.
- Casana, J. 2015. "Satellite Imagery-Based Analysis of Archaeological Looting in Syria." *Near Eastern Archaeology* 78: 142–152. doi:10.5615/neareastarch.78.3.0142.

- Casana, J., and M. Panahipour. 2014. "Satellite-based Monitoring of Looting and Damage to Archaeological Sites in Syria." *Journal of Eastern Mediterranean Archaeology and Heritage Studies* 2: 129–152. doi:10.5325/jeasmedarcherstu.2.2.0128.
- Cunliffe, E. 2014. "Archaeological Site Damage in the Cycle of War and Peace: A Syrian Case Study." *Journal of Eastern Mediterranean Archaeology and Heritage Studies* 2: 229–247. doi:10.5325/jeasmedarcherstu.2.3.0229.
- Cunliffe, E. 2016. "Sixty Years of Site Damage in the Carchemish Region." In *Carchemish in Context*, edited by T. J. Wilkinson, E. Peltenburg, and E. B. Wilkinson, 203–214. Oxford: Oxbow.
- Cunliffe, E., M. W. de Gruchy, and E. Stammitti. 2012. "How to Build a Dam and Save Cultural Heritage." *International Journal of Heritage in the Digital Era* 1 (supplement 1): 221–226. doi:10.1260/2047-4970.1.0.221.
- Curtis, J., Q. H. Raheed, H. Clarke, A. Al Hamdani, E. Stone, M. Van Ess, P. Collins, and M. Ali. 2008. "An Assessment of Archaeological Sites in June 2008: An Iraqi-British Project." *Iraq* 70: 215–237. doi:10.1017/S0021088900000966.
- Danti, M. 2015. "Ground-Based Observations of Cultural Heritage Incidents in Syria and Iraq." *Near Eastern Archaeology* 78: 132–141. doi:10.5615/neareastarch.78.3.0132.
- Davis, T. 2014. "From Babylon to Baghdad: Cultural Heritage and Constitutional Law in the Republic of Iraq." *International Journal of Cultural Property* 21: 445–463. doi:10.1017/S0940739114000265.
- Demoule, J. P. 2012. "Rescue Archaeology: A European View." *Annual Review of Anthropology* 41: 611–626. doi:10.1146/annurev-anthro-092611-145854.
- DGAM 2013. Maps Document Damage to Syrian Archaeological Heritage. Accessed 18 April 2019. <http://www.dgam.gov.sy/index.php?p=314&id=1026>
- Dougherty, R. P. 1926. "Searching for Ancient Remains in Lower Iraq: Report on an Archaeological Survey Made in Southern Babylonia during the First Quarter of 1926." *Annual of the American School of Oriental Research* 7: 1–93. doi:10.2307/3768498.
- Emberling, G., and K. Hanson. 2008. *Catastrophe! The Looting and Destruction of Iraq's Past*. (Oriental Institute Museum Publication 28). Chicago: Chicago University Press.
- Fisk, R. 2008. *The Destruction of Cultural Heritage in Iraq*. Woodbridge: Boydell & Brewer.
- Fradley, M., and N. Sheldrick. 2017. "Satellite Imagery and Heritage Damage in Egypt: A Response to Parcak Et Al. (2016)." *Antiquity* 91: 784–792. doi:10.15184/aqy.2017.25.
- Frahm, E. 2015. "Mutilated Mnemotopes: Why ISIS Destroys Cultural Heritage Sites in Iraq and Syria." *European Union National Institutes for Culture*, 3 December. Accessed 8 April 2019. [https://www.cademia.edu/19580732/Mutilated\\_Mnemotopes\\_Why\\_ISIS\\_Destroys\\_Cultural\\_Heritage\\_Sites\\_in\\_Iraq\\_and\\_Syria](https://www.cademia.edu/19580732/Mutilated_Mnemotopes_Why_ISIS_Destroys_Cultural_Heritage_Sites_in_Iraq_and_Syria)
- Fund, G. H. 2010. *Saving Our Vanishing Heritage. Safeguarding Endangered Cultural Heritage Sites in the Developing World*. Palo Alto: Global Heritage Fund.
- Harmanşah, O. 2015. "ISIS, Heritage, and the Spectacles of Destruction in the Global Media." *Near Eastern Archaeology* 78: 170–177. doi:10.5615/neareastarch.78.3.0170.
- ICOMOS. 2000. *Heritage at Risk: ICOMOS World Report 2000 on Monuments and Sites in Danger*. Paris: ICOMOS.
- Isakhan, B. 2014. "Creating the Iraq Cultural Property Destruction Database: Calculating a Heritage Destruction Index." *International Journal of Heritage Studies* 21 (1): 1–21. doi:10.1080/13527258.2013.868818.
- Jokilehto, J. 2000. "ICCROM's Involvement in Risk Preparedness." *Journal of the American Institute for Conservation* 39: 173–179. doi:10.1179/019713600806113275.
- Jones, C. 2018. "Understanding ISIS's Destruction of Antiquities as a Rejection of Nationalism." *Journal of Eastern Mediterranean Archaeology and Heritage Studies* 6: 31–58. doi:10.5325/jeasmedarcherstu.6.1-2.0031.
- Lippolis, C. 2018. "Patterns of Destruction: The Looting of Tūlūl Al Baqarat in the Last 20 Years." *Sumer* LXIV: 49–65.
- Lopez, P. J. M. 2016. "Integrated Risk Assessment for Cultural Heritage Sites: a Holistic Support Tool for Decision-making." PhD diss., IMT School for Advanced Studies, Lucca.

- Marchetti, N., A. al-Hussainy, M. Valeri, and F. Zaina. 2018. "Assessing Endangered Cultural Heritage in Central Iraq. Methods and Perspectives from the QADIS Survey Project." *Sumer* LXIV: 11–34.
- Marchetti, N., G. Benati, E. Leoni, H. A. Hussainy, G. Luglio, M. Valeri, G. Scazzosi, and F. Zaina. *Forthcoming*. "The Formation of Urbanized Landscapes in Mesopotamia: An Integrated Survey Methodology to Understand Multi-layered Historical Landscapes." *Zeitschrift für Assyriologie und Vorderasiatische Archäologie*.
- Marchetti, N., A. Curci, M. C. Gatto, S. Muhl, S. Nicolini, and F. Zaina. 2019. "A Multi-scalar Approach for Assessing the Impact of Dams on the Cultural Heritage in the Middle East and North Africa." *Journal of Cultural Heritage* 37: 17–28. doi:10.1016/j.culher.2018.10.007.
- Marchetti, N., B. Einwag, A. al-Hussainy, E. Leoni, G. Luglio, G. Marchesi, A. Otto, G. Scazzosi, M. Valeri, and F. Zaina. 2017. "QADIS. The 2016 Iraqi-Italian Survey Season in the South-eastern Region of Qadisiyah." *Sumer* LXIII: 63–92.
- Marshall, Y. 2002. "What Is Community Archaeology?" *World Archaeology* 34: 211–219. doi:10.1080/0043824022000007062.
- Matthews, R., Q. H. Rasheed, M. Palmero Fernández, S. Fobbe, K. Nováček, R. Mohammed-Amin, S. Mühl, and A. Richardson. 2019. "Heritage and Cultural Healing: Iraq in a post-Daesh Era." *International Journal of Heritage Studies* 25: 2–22.
- Ministry of Information. 1936. *Antiquities Law No. 59 of 1936, and the Two Amendments No. 120 of 1974 and No. 164 of 1975*. Baghdad: Ministry of Information. [https://sherloc.unodc.org/cld/en/legislation/irq/antiquities\\_law\\_no\\_59\\_of\\_1936/chapter\\_vi/articles\\_55-64/antiquities\\_law\\_no\\_59\\_of\\_1936\\_.html?](https://sherloc.unodc.org/cld/en/legislation/irq/antiquities_law_no_59_of_1936/chapter_vi/articles_55-64/antiquities_law_no_59_of_1936_.html?)
- Ministry of Tourism and Antiquities. 2002. *Law No. 55 of 2002 for the Antiquities & Heritage of Iraq*. Baghdad: Ministry of Tourism and Antiquities. <https://www.cemml.colostate.edu/cultural/09476/pdf/iraq-antiquities-law-2002.pdf>
- Moser, S., D. Glazier, J. E. Phillips, L. N. El Nemr, M. S. Mousa, R. N. Aiesh, S. Richardson, A. Conner, and M. Seymour. 2002. "Transforming Archaeology through Practice: Strategies for Collaborative Archaeology and the Community Archaeology Project at Quseir, Egypt." *World Archaeology* 34: 220–248. doi:10.1080/0043824022000007071.
- Moshenska, G., and S. Dhanjal, eds. 2011. *Community Archaeology: Themes, Methods and Practices*. Oxbow: Oxford.
- Munawar, N. A. 2017. "Reconstructing Cultural Heritage in Conflict Zones: Should Palmyra Be Rebuilt?" *Ex Novo Journal of Archaeology* 2: 33–48.
- Novaković, P., M. Horňák, M. P. Guermandi, H. Stäuble, P. Depaepe, and J.-P. Demoule, eds. 2016. *Recent Developments in Preventive Archaeology in Europe Proceedings of the 22nd EAA Meeting in Vilnius, 2016*. Ljubljana: University Press.
- Otto, A., B. Einwag, A. al-Hussainy, J. Jawadat, C. Fink, and H. Maaß. 2018. "Destruction and Looting of Archaeological Sites between Fāra/šurruk and Išān Bahriyāt/Isin: Damage Assessment during the Fara Regional Survey Project FARSUP." *Sumer* LXIV: 35–48.
- Palumbo, G. 2000. "Threats and Challenges to the Archaeological Heritage in the Mediterranean." In *Management Planning for Archaeological Sites*, edited by J. M. Teutonico and G. Palumbo, 3–13. Los Angeles: Getty Conservation Institute.
- Parcak, S. 2015. "Archaeological Looting in Egypt: A Geospatial View (Case Studies from Saqqara. Lisht and El Hibeh)." *Near Eastern Archaeology* 78: 196–203. doi:10.5615/neareastarch.78.3.0196.
- Parcak, S., D. Gathings, C. Childs, G. Mumford, and E. Cline. 2016. "Satellite Evidence of Archaeological Site Looting in Egypt: 2002–2013." *Antiquity* 90: 188–205. doi:10.15184/aqy.2016.1.
- Pollock, S. 1990. "Archaeological Investigations on the Uruk Mound, Abu Salabikh, Iraq." *Iraq* 52: 85–93. doi:10.2307/4200321.
- Pournelle, J. 2013. "Physical Geography." In *The Sumerian World*, edited by H. Crawford, 13–32. London: Routledge.
- Proulx, B. B. 2013. "Archaeological Site Looting in 'Glocal' Perspective: Nature, Scope, and Frequency." *American Journal of Archaeology* 117: 111–125. doi:10.3764/aja.117.1.0111.



- Qureshi, A. S., A. Waqas, and A. A. Al-Falahi. 2013. "Optimum Groundwater Table Depth and Irrigation Schedules for Controlling Soil Salinity in Central Iraq." *Irrigation and Drainage* 62: 414–424. doi:10.1002/ird.1746.
- Richardson, B. F. 2011. "Techniques of Detecting and Delineating Archaeological Site Destruction Using High Resolution Satellite Imagery: An Iraq Case Study." Paper presented at the ASPRS 2011 Annual Conference Milwaukee, Wisconsin, 1–5 May 2011. Accessed 5 May 2019. <http://www.asprs.org/a/publications/proceedings/Milwaukee2011/files/Richason.pdf> 10.3310/hta23120.
- Rothfield, L. 2008. *Antiquities under Siege. Cultural Heritage Protection after the Iraq War*. Lanham: Alta Mira Press.
- Russell, J. R. 2008. "Efforts to Protect Archaeological Sites and Monuments in Iraq, 2003–2004." In *Catastrophe! the Looting and Destruction of Iraq's Past*, edited by G. Emberling and K. Hanson, 29–44. Oriental Institute Museum Publication 28. Chicago: Oriental Institute.
- Smith, C., H. Burke, C. de Leuien, and G. Jackson. 2016. "The Islamic State's Symbolic War: Da'esh's Socially Mediated Terrorism as a Threat to Cultural Heritage." *Journal of Social Archaeology* 16: 164–188. doi:10.1177/1469605315617048.
- Stone, E. 2008a. "Patterns of Looting in Southern Iraq." *Antiquity* 82: 125–138. doi:10.1017/S0003598X00096496.
- Stone, E. 2008b. "Archaeological Site Looting: The Destruction of Cultural Heritage in Southern Iraq." In *Catastrophe! the Looting and Destruction of Iraq's Past*, edited by G. Emberling and K. Hanson, 65–80. Oriental Institute Museum Publication 28. Chicago: Chicago University Press.
- Stone, E. 2014. "High-Resolution Imagery and the Recovery of Surface Architectural Patterns." *Advances in Archaeological Practice* 2: 180–194. doi:10.7183/2326-3768.2.3.180.
- Stone, E. 2015. "An Update on the Looting of Archaeological Sites in Iraq." *Near Eastern Archaeology* 78: 186. doi:10.5615/neareastarch.78.3.0178.
- Stone, P. G. 2015. "The Challenge of Protecting Heritage in Times of Armed Conflict." *Museum International* 67: 40–54. doi:10.1111/muse.12079.
- Stovel, H. 1998. *Risk Preparedness: A Management Manual for World Cultural Heritage*. Rome: ICCROM.
- Teutino, J. M., and G. Palumbo, eds. 2000. *Management Planning for Archaeological Sites*. Los Angeles: Getty Conservation Institute.
- UNESCO. 1954. *Convention for the Protection of Cultural Property in the Event of Armed Conflict*. Paris: UNES. <https://www.refworld.org/docid/40422c914.html>
- UNESCO. 1970. *Convention on the Means of Prohibiting and Preventing the Illicit Import, Export and Transfer of Ownership of Cultural Property*. Paris: UNES. [http://portal.unesco.org/en/ev.php-URL\\_ID=13039&URL\\_DO=DO\\_TOPIC&URL\\_SECTION=201.html](http://portal.unesco.org/en/ev.php-URL_ID=13039&URL_DO=DO_TOPIC&URL_SECTION=201.html)
- UNESCO. 1972. *Convention Concerning the Protection of the World Cultural and Natural Heritage*. Paris: UNES. <https://whc.unesco.org/en/convention/>
- UNESCO. 1999. *Second Protocol to the Hague Convention of 1954 for the Protection of Cultural Property in the Event of Armed Conflict*. Paris: UNES. [http://portal.unesco.org/en/ev.php-URL\\_ID=15207&URL\\_DO=DO\\_TOPIC&URL\\_SECTION=201.html](http://portal.unesco.org/en/ev.php-URL_ID=15207&URL_DO=DO_TOPIC&URL_SECTION=201.html)
- UNESCO. 2015. *Operational Guidelines for the Implementation of World Heritage Convention*. Paris: UNES. <https://whc.unesco.org/en/guidelines/>
- Van Heese, M. 2010. "Iraq and the Second Protocol to the 1954 Hague Convention." In *Protecting Cultural Property in Armed Conflict*, edited by N. Van Woudeberg and L. Lijnzaad, 135–145. Leiden: Brill.
- Wilkinson, T. J. 2003. *Archaeological Landscapes of the Near East*. Tucson: University of Arizona.
- Wilkinson, T. J., L. Rayne, and J. Jotheri. 2015. "Hydraulic Landscapes in Mesopotamia: The Role of Human Niche Construction." *Water History* 7 (4): 397–418. doi:10.1007/s12685-015-0127-9.
- Wu, W., W. M. Al-Sha, A. S. Mhaimeed, F. Ziadat, V. Nangia, and W. B. Payne. 2014b. "Soil Salinity Mapping by Multiscale Remote Sensing in Mesopotamia, Iraq." *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing* 7: 4442–4452. doi:10.1109/JSTARS.2014.2360411.
- Wu, W., A. S. Mhaimeed, W. M. Al-Sha, F. Ziadat, B. Dhehibi, V. Nangia, and E. De Pauw. 2014. "Mapping Soil Salinity Changes Using Remote Sensing in Central Iraq." *Geoderma Regional* 2-3: 21–31. doi:10.1016/j.geodrs.2014.09.002.
- Zerbini, A. 2018. "Developing a Heritage Database for the Middle East and North Africa." *Journal of Field Archaeology* 43: 9–18. doi:10.1080/00934690.2018.1514722.