

# PRELIMINARY REPORT ON THE TEMPLE OF THE WINGED LIONS CULTURAL RESOURCE MANAGEMENT INITIATIVE (2009 - 2013)

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The Temple of the Winged Lions (TWL) is a majestic Nabataean temple built on a promontory above the north bank of Wadi Musa, overlooking the city center of Petra (**Fig. 1**). Although the presence of a monumental structure in this spot was recognized as early as the end of the 19th century, it was not until the 1970s that the nature of the building was identified. The temple and several areas abutting it were the focus of a long-term excavation project directed by the late Philip C. Hammond (1924 - 2008) during the years 1974 to 2005, *viz.* the American Expedition to

Petra (AEP) (Hammond 1996). During the early years of the AEP project, the temple's cella was cleared, leading to the discovery of the unique 'winged lions' capitals (from columns around the central cultic podium) that gave the building the moniker still used today. Other data recovered from the excavations led to the identification of the temple as likely having been dedicated to the primary Nabataean goddess al-Lat / al-'Uzza, and also possibly as a place where the imported Hellenistic Isis cult was celebrated.

Owing to a variety of factors, including



*1. Aerial view of the Temple of the Winged Lions, Petra, Jordan. (Photo C. A. Tuttle).*

limited funding, the TWL was unfortunately never thoroughly conserved or restored during the life of the AEP project. A few conservation interventions were undertaken by the AEP, but these were generally limited to essential stabilization needs. The only significant conservation / restoration effort was undertaken in 1988 by the Department of Antiquities and involved the west wall of the temple cella which was at risk of completely collapsing. The rest of the building and its precinct, however, have remained without any conservation interventions for nearly 40 years. As a result, the structural elements have suffered severe deterioration from wind, water and use-related erosion, solar radiation exposure, rising damp and salt efflorescence, geological action and vandalism. By 2009, the overall state of the TWL had become dire and it was clear that without a major and concerted initiative to address the many and complex issues plaguing the precinct, the long-term survival of the temple was not assured.

In order to save this important part of Petra's story, the Temple of the Winged Lions Cultural Resource Management (TWLCRM) initiative was launched in 2009 as a co-operative project involving the American Center of Oriental Research (ACOR), the Department of Antiquities of Jordan (DoA) and the Petra Archaeological Park (PAP) (for a thorough introduction to the project and its goals, see Tuttle 2013a). The initiative was developed with the intent of accomplishing a number of important goals: (1) to stabilize, conserve and protect the monumental temple and its precinct, (2) to rehabilitate the surrounding landscape that had been adversely affected by the original excavation project, (3) to develop and implement a comprehensive presentation strategy for the temple and its environs, (4) to (re-)publish all of the data derived from both the original excavation and the new project, (5) to help develop guidelines and manuals for different aspects of cultural resource management (CRM) work in the PAP and (6) to help build local capacity for undertaking CRM efforts as a

means of increasing the likelihood that current and future work will become sustainable.

The need to achieve such diverse goals has required the TWLCRM to evolve, since its inception, into an innovative project for Petra - one which employs a holistic, grassroots model that encompasses a number of sub-components, *viz.* assessment, documentation, landscape rehabilitation, conservation, restoration, presentation, archives and publication. The key unifying factor that integrates these sub-components is an emphasis on a social engagement approach (see below) which directly involves members of Petra's local communities in nearly all aspects of the work, including photography, drawing, artifact processing, data classification and database entry. This is intended to foster the development of different types of capacity within these communities and provide an accessible venue for their unique, innate contributions to such projects. The capacity-building includes training in a variety of job skills, developing consciousness about the different 'outstanding universal values' that make Petra a World Heritage Site, fostering a sense of 'ownership' of both the monuments themselves and the work undertaken on them, and perhaps most importantly, creating a dialogue-based ethos that permits a beneficial educational exchange between the foreign and local members of the team.

Funding for the TWLCRM initiative, initially provided by a small grant from the Global Heritage Fund, increased substantially in 2011 when the project was awarded a US Ambassador's Fund for Cultural Preservation (AFCP) Large Grant totaling \$600,000 over four years. Other funding for the project is provided by ACOR from a USAID endowment for cultural heritage work in Jordan, while work by the TWL conservation team has been made possible in part through the gracious sponsorship of Royal Jordanian Airlines, which donated nine round-trip flights for the international conservation specialists in 2013. In-kind logistical support has been provided by both the DoA and PAP, and in 2012 and 2013 Engineer Asma Shaltough, head of conservation at the DoA, was project co-director.

## **Archives**

One of the first major goals of the TWLCRM initiative was to gain access to the original AEP excavation archives. Fortunately, this effort had the strong support of the late Fawwaz al-Khraysheh, then DoA Director-General, who contacted Philip Hammond's widow, Lin Hammond, to inquire about the possibility of gaining access to the archive. She graciously arranged to have returned to Jordan the entire AEP archive. It arrived at ACOR in January 2010, where it is now being stored and gradually catalogued and digitized on a year-round basis. In addition, the archival team has been working to digitally 'ink' many of the scanned materials for use in future publications, particularly the thousands of excavation and pottery drawings. Ultimately, the scanned AEP archive materials will be incorporated into a searchable digital database that will directly support the analysis and publication work of the TWLCRM.

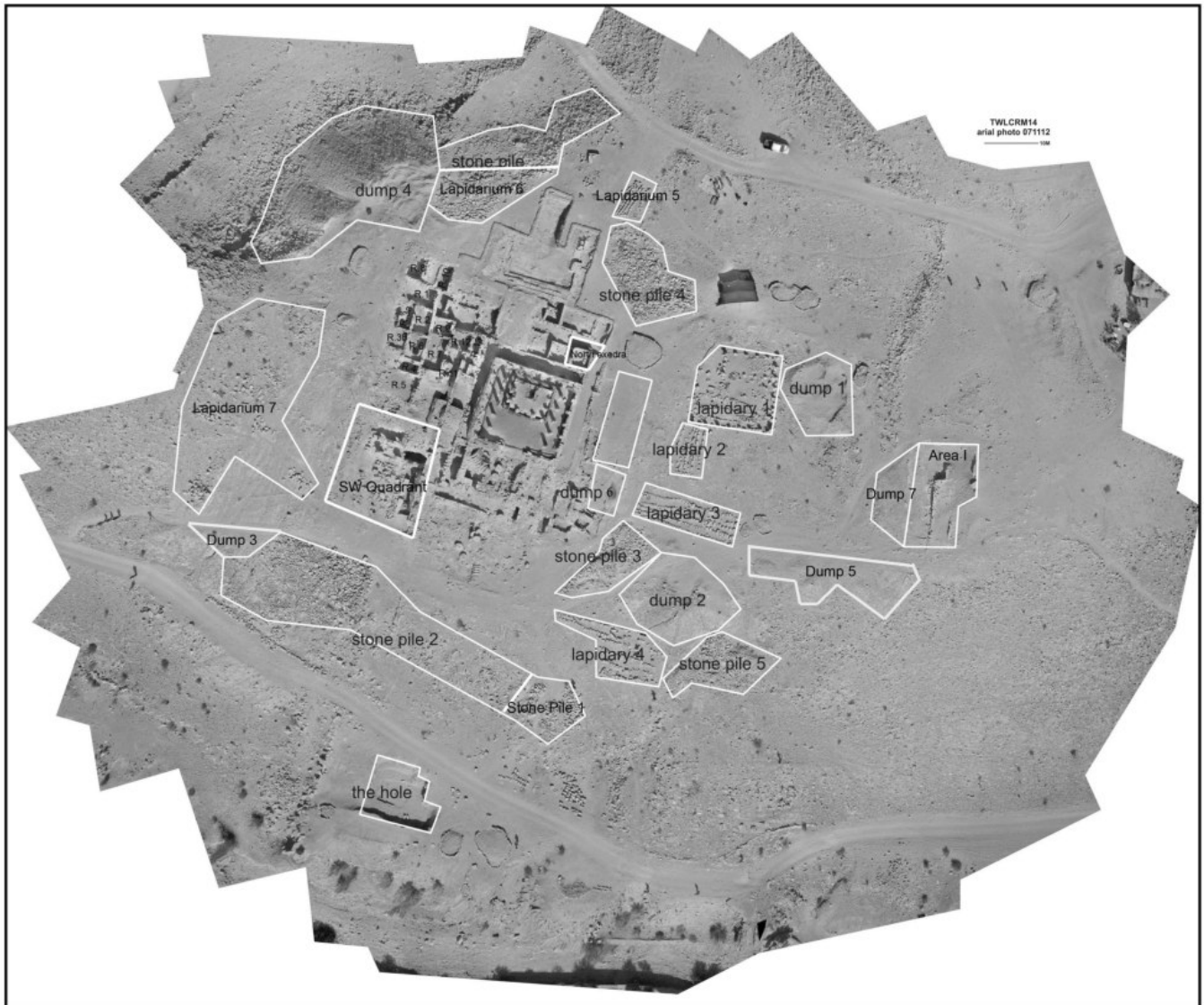
## **Documentation**

Much of the work conducted by the TWLCRM between 2009 and 2013 has focused on the initiative's documentation sub-component. The current state of all the standing architecture in the TWL area has been recorded by photographs, and work has begun to correlate these images with corresponding data from the AEP archives. Drawings to record the different types of damage evident on the temple itself using a standard classification system have also been completed. All of the standing architecture in the temple proper has now been drawn and classified into a new categorization scheme. An 'archaeology of masonry' study of the architectural construction phasing for some of the ancillary areas around the precinct has also been initiated. In addition, the documentation team has worked to systematically record, catalogue and consolidate the extensive range of stone construction materials found in the lapidaries, ashlar dumps and rubble piles that are part of the enormous 'impact zone' extending outward from the excavated area of the TWL (see below).

Other documentation work has focused on developing a comprehensive overview of the entire TWLCRM site. This has included an intensive total station survey, conducted by DoA surveyor Qutaiba Dasouqi, of the TWL precinct and the project's broader impact zone, as well as of the area of the ascending propylaeum (grand entryway) that originally provided access to the temple from the wadi below. Dasouqi's survey has allowed the project to relocate and re-establish the original AEP excavation grid and also geo-reference the final AEP top plan. In addition, the project co-operated with a team from the University of California, San Diego (directed by Thomas E. Levy) and the DoA to obtain complete aerial coverage of the TWLCRM work zone using a specially-designed helium balloon. The result of both efforts has been a complete geo-referenced site plan that uses the composite aerial photograph as the background for the project's various work zones (**Fig. 2**). Additional aerial photography was also obtained with the assistance of Ivan LaBianca who used an unmanned aerial vehicle (UAV) to take low-altitude photographs of the site.

## **Landscape Rehabilitation**

One of the major problems faced by the TWLCRM is the massive impact zone left by the original AEP project on the landscape surrounding the excavated temple areas. This zone radiates outward from the temple for  $\pm 150 - 200$  meters in all directions and consists of numerous lapidaries, ashlar dumps, rubble piles and soil dumps. This impact zone adversely affects a number of Petra's 'outstanding universal values' as a World Heritage Site, especially the aesthetic, environmental / ecological, didactic and scientific. A major CRM innovation that this project has introduced into Petra is the concept of 'landscape rehabilitation'. This sub-component is experimenting with developing ways to mitigate some of the impacts that are found in this zone. The goals are to enhance the overall final presentation strategy for the TWL, to remove impediments that presently



2. Site plan of TWLCRM work zones outlined on a composite aerial photograph taken of the site in November 2012. (Aerial image courtesy of the University of California, San Diego - California Institute of Telecommunications and Information Technology [Calit2], Levantine Archaeology Laboratory and Cyber-Archaeology Laboratory; the Temple of the Winged Lions Cultural Resource Management Initiative (TWLCRM) of the American Center of Oriental Research (ACOR); the Department of Antiquities of Jordan).

complicate or impede additional scientific research in adjacent areas and, most importantly, to try to understand better the long-term impact of archaeology on the natural landscape.

The most visible work that can be seen on the site today is related to this sub-component (**Fig. 3**). In June 2012, the TWLCRM team began to remove systematically the soil, rubble and ashlar dumps from the landscape. The soil dumps were re-excavated and the soils sifted. All recovered material culture was collected, sorted and processed for study by trained local team members. The clean soil, pebbles and

cobbles were all separated and stored separately for recycled use in subsequent efforts on the site. Some of the clean soils were immediately used for the temporary backfilling of areas within the TWL to create protective surfaces on which the team could work without causing new damage. Removal of the site's major rubble piles and ashlar dumps has proceeded in a similar way. The ashlars were first moved from the dumps to a temporary work area. Each stone was examined there, to determine if there were any special features, and was then assessed for suitability for possible re-use. All ashlars were measured





3. TWLCRM local team members sifting the soils re-excavated from the original AEP project dumps. (Photo M. E. Ronza).

and inventoried; the different types of tool marks that may have been evident were recorded using a standardized system. Those ashlar not selected for retention were then moved into old AEP excavation trenches and reburied.

Since 2012 when the landscape rehabilitation sub-component began in earnest, significant results have been achieved. Three major soil dumps have been removed from the landscape and recycled; work on removing the largest soil Dump 4 as well as other smaller dumps has also begun. The removal and sifting of soil Dump 1 alone yielded nearly 2.5 metric tons of ceramic fragments (amounting to more than 500,000 sherds, all of which were examined by TWLCRM ceramologist Tali Erickson-Gini). Stone Piles 2, 3 and 4 (totaling some 3,500 ashlar) have all been fully removed from the landscape; these were carefully sorted by stone type and the materials relocated and organized. All of the architectural elements in the Lapidaries (1 - 7) have been sorted, cataloged and re-documented; many of these excavated elements were relocated to temporary areas to await permanent storage through reburial in backfilled areas; the architectural elements that will remain visible are currently all being consolidated into the

existing footprint of a single area (Lapidary 1).

A number of subsidiary projects related to the landscape rehabilitation sub-component have also been undertaken. In 2012 the site was gridded and a baseline survey of vegetation cover was conducted; a comparison site elsewhere in Petra that has a similar slope and aspect, but without archaeological disturbance, was also surveyed. These sites will be monitored seasonally during the coming years so that changes can be noted and documented. An experiment was also begun on the site in which six raised planting beds were constructed and filled with different types of soils from the TWLCRM work zone. These beds will be observed throughout the project in order to see what may or may not grow naturally. All of these data will eventually contribute toward the final presentation and management strategy for the site.

### **Conservation**

The first round of conservation work on the TWL began in spring 2013 after nearly three years of preparation that involved thoroughly studying the current condition of the architecture and the forms of degradation present, analyzing the different types of building materials (e.g. mortars, grades of sandstone etc.), and

determining the correct types of consolidation products as well as mortar ingredients and mixtures to be employed for the different circumstances found inside the TWL precinct after testing. All interventions were planned on the basis of internationally accepted best practice and the specific contexts of the construction materials and techniques employed at Petra.

Work on implementing the necessary stabilizing interventions began in March 2013 with a team of international and local conservators and conservation technicians led by lead conservator Christina Danielli. The focus of this first two-month campaign was the interior face of the north wall of the temple *cella*; this wall was determined by Danielli and the rest of the TWLCRM team to be a priority owing to its advanced state of degradation. During a nine-week period, the conservation team cleaned the wall of the detritus that had accumulated since the original 1970s excavation, removed salts, stabilized flaking and scaling stone surfaces, sealed cracks, conserved a few *in situ* examples of original plasters and treated all surfaces with consolidants (Fig. 4). They also applied hydraulic mortar to the wall in order to: (1) prevent water from percolating between the ashlar, (2) increase the wall's overall stability and (3) reduce salt-efflorescence (with the

mortar acting as an absorption layer). Finishing mortar was then emplaced and roughly textured in order to help integrate the new work aesthetically into the existent building. Some additional cleaning and consolidation work was also undertaken on columns still standing in the temple *cella*. Conservation work on the temple complex will continue in 2014 and 2015.

### Presentation Strategy

In 2013, the TWLCRM initiative also began working on the final presentation strategy for the site. The TWLCRM team met in the autumn of 2012 to decide on the minimal extent of restoration (*anastylosis*) that would be needed to meet all of the presentation strategy goals, such as the structural needs of the building as well as the educational / didactic, aesthetic and environmental impacts. The decision was made to restore a small cluster of five of the original first-storey columns in the *cella* to an accurate approximation of their original heights with the appropriate capitals. Two columns from the west colonnade were selected to be crowned with original Nabataean-Corinthian capitals, while three columns at the north-west corner of the cultic podium would be restored and crowned with a combination of original and replica 'winged lions' capitals.



4. A member of the TWLCRM conservation team treats the north wall of the temple's *cella* with a consolidant solution.

The TWLCRM restoration and documentation teams then developed a unique plan to test the restoration proposal. The columns and capitals would first be built using lightweight materials at one-to-one scale and then be placed in their original locations to see if the end product would in fact meet all of the goals. The teams, along with local trainees, then spent the next few months making all of the life-sized column elements out of lightweight materials. The drums were cast in plaster using molds; they were also made hollow to reduce their weight (*ca* 60 kgs each versus 350+ kgs for the original stone). The capitals were constructed using layered sheets of polystyrene; the details were then carved in polystyrene and affixed to the blank capitals. The drums and capitals were finally painted and textured with realistic patinas.

The extant portions of the original columns inside the temple *cella* were prepared so that they would not be in any way damaged by the installation of the ‘faux’ columns on top of them. The two original west colonnade columns are also leaning severely, so this problem had to be solved so that the lightweight replicas would stand true in order to present like the originals. The solution was to build wooden supporting frames around the columns where needed and install wooden platforms on top of all the columns

that would buffer the points of contact and bear the weight. This innovative, experimental archaeology effort was unveiled at a public event held on site in May 2013 (**Fig. 5**). The entire TWLCRM team (and invited guests) were able to see with their own eyes one of the final products that would ultimately result from all of their efforts on the project.

### **Social Engagement**

The central sub-component of the TWLCRM is the initiative’s use of a social engagement model that aims to involve members of Petra’s local communities in as many aspects of the project as possible. The ultimate goal is to lay grassroots, local foundations for a sustainable preservation ethos in Petra that functions at both the cognitive and practical levels.

The TWLCRM’s first step was to inaugurate an egalitarian system for hiring local team members for work and training. A system was designed in which everyone’s name is registered on a roster, which is organized by town, tribe and family unit. This allows the project to apportion the opportunities available in each field equally; this system is further augmented through a dialogue between the TWLCRM and local communities who help prioritize people who have immediate or special need. The initiative also introduced a tiered pay scale that



5. TWLCRM team members place the ‘faux restoration’ columns in order to test the project’s final presentation strategy. (Photo Q. Tweissi).

provides local team members with opportunities for advancement based on the acquisition of new skills, demonstrated commitment to the project and increased CRM awareness, as well as other factors. The project also hired women for a range of different fieldwork tasks and training, for the first time in many cases.

A few statistics will demonstrate the impact within the local communities of the social engagement model used by the TWLCRM. During the first 18 months of fieldwork, the TWLCRM created more than 500 employment and training opportunities that were fulfilled by some 260 individuals. Women represented 59% of these individuals; youths (under the age of 30) represented about 75%; a full 100% of participants derive from communities defined in Jordan as known poverty centers.

One of the most exciting social engagement elements has been the creation of an informal women's sandbag co-operative within the surrounding towns (**Fig. 6**). The TWLCRM needs about 12,000 sandbags - which are not readily available in Jordan. Rather than import sandbags at great expense, the initiative decided instead to make them locally. Recycled burlap (jute) rice bags were purchased and then provided to local women, many of whom are divorced or widowed with children, who

hand modified them to the form required for the project. The modified bags were then filled on site (using clean soil from the sifted dumps) and sewn closed. The filled bags were used for buttressing architecture, controlling foot-traffic and other stabilization efforts. The TWLCRM hopes to make this sandbag co-operative sustainable through opening up this service to other projects in Jordan.

In addition to providing training and employment opportunities, the TWLCRM has also sought to play a more positive, constructive role within the lives of its team members and the broader local community. This has included: (1) the staffing and opening in March 2013 of a childcare center in the village of Umm Sayhoun (in co-operation with the local Social Development Center) that provides daycare services for local women, including those working on the project, (2) a 'Children's Day' at the site in April 2013 that gave the children of local team members the chance to interact with the site and experience the different types of work done by their parents and (3) a day-long program in October 2013 that introduced the site and its various sub-components to young girls participating in the Petra National Trust's Youth Education Program. The TWLCRM team has also benefited from the use of social



6. TWLCRM team member Khatima Ruwei Jdeilat sews a sandbag closed on site. (Photo Q. Tweissi).



media to enhance and promote its social engagement strategy. In May 2013 the project launched a Facebook page ([www.facebook.com/TWLCRM](http://www.facebook.com/TWLCRM)) that tells the story of the Temple of the Winged Lions monument in Petra and the history of work that has been done at the site from 1973 to the present. Many of the local team members are now on Facebook and have learned to engage with the project in different ways through this social media venue. Finally, project founding director and former ACOR associate director Christopher Tuttle wrote two introductory articles on the project for the *ACOR Newsletter* (Tuttle 2012; 2013b) and also gave a public lecture at ACOR in April 2013 entitled “A Holistic Approach to Preserving Petra - Introducing the Temple of the Winged Lions Cultural Resource Management (TWLCRM) Initiative”.

#### **Future Directions**

The TWLCRM Initiative will enter its final phases in 2014 and 2015, with an emphasis on concluding the project’s landscape rehabilitation sub-component and conserving, stabilizing and backfilling many of the exposed areas from the earlier AEP excavations that are at risk. In addition, the plan is to implement the final presentation strategy, starting with the erection of the five columns and capitals in the temple’s cella, followed ultimately by the creation of a walkway, platform and signage that will guide visitors safely around the site. All this will continue to be accomplished through the active engagement and ongoing capacity-building of Petra’s local communities.

Analysis and publication of both the original AEP archives and the new TWLCRM data will continue in 2016 and beyond.

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