An Introduction to the Stone Age Archaeology of the Polihali Dam Area, Mokhotlong District, Lesotho

Tim Forssman
Department of Anthropology and Archaeology, University of Pretoria, Private Bag X20 Hatfield, Tshwane, 0028, South Africa
tim.forssman@up.ac.za

Matt Lotter
Palaeo-Research Institute, University of Johannesburg, PO Box 524, Auckland Park, 2006, South Africa

John Parkington
Department of Archaeology, University of Cape Town, Private Bag, Rondebosch, 7700, Cape Town, South Africa

Jeremy Hollmann
Rock Art Research Institute, School of Geography, Archaeology and Environmental Studies, University of the Witwatersrand, PO Wits 2050, Johannesburg, South Africa

Jessica Angel
PGS Heritage (Pty) Ltd, PO Box 32542 Totiusdal, East Lynne, Pretoria 0134, South Africa

Wouter Fourie
PGS Heritage (Pty) Ltd, PO Box 32542 Totiusdal, East Lynne, Pretoria 0134, South Africa

Abstract

Much of Lesotho's cultural heritage has been studied as a result of dam developments. Where dams have been built, heritage studies have provided crucial data for improving our understanding of local archaeological sequences. Ahead of the construction of the Lesotho Highland Development Authority's (LHDA) new Polihali Dam in Lesotho's Mokhotlong District and following the recommendations of a heritage assessment (CES 2014), a large-scale five-year cultural heritage management program launched in 2018 that seeks to excavate and mitigate a number of heritage sites. Here, we provide the background to one of southern Africa's largest heritage mitigation contracts by contextualising the current research program and present the archaeology of Lesotho's eastern highlands basalt region using data collected during the inception phase of this program. The findings challenge current preconceived notions about the sparsity of archaeological remains for this region.

Keywords

Stone Age – rock art – cultural heritage management – dams – Lesotho

1 Introduction

The contribution that heritage management in Lesotho has made to our understanding of southern African archaeological, and in particular, Stone Age sequences is immense. Notable sites include Sehonghong, Melikane (Carter 1978; Mitchell 1994, 1995, 1996a, b, 2010; Jolly 1995; Jacobs et al. 2008; Stewart et al. 2012), Likoaeng (Mitchell et al. 2006; Plug et al. 2010) and Pitsaneng (Hobart 2004), to name but a few. These, and other sites in Lesotho, have developed our knowledge of southern Africa's Stone Age sequence, including subsistence habits, settlement and seasonal patterns, stone tool production techniques, formal tool morphology and preferences, chronological sequences, forager food production, and San rock art (see references above and e.g. Mitchell 2002; Lombard et al. 2012). This work has also further enriched and advanced

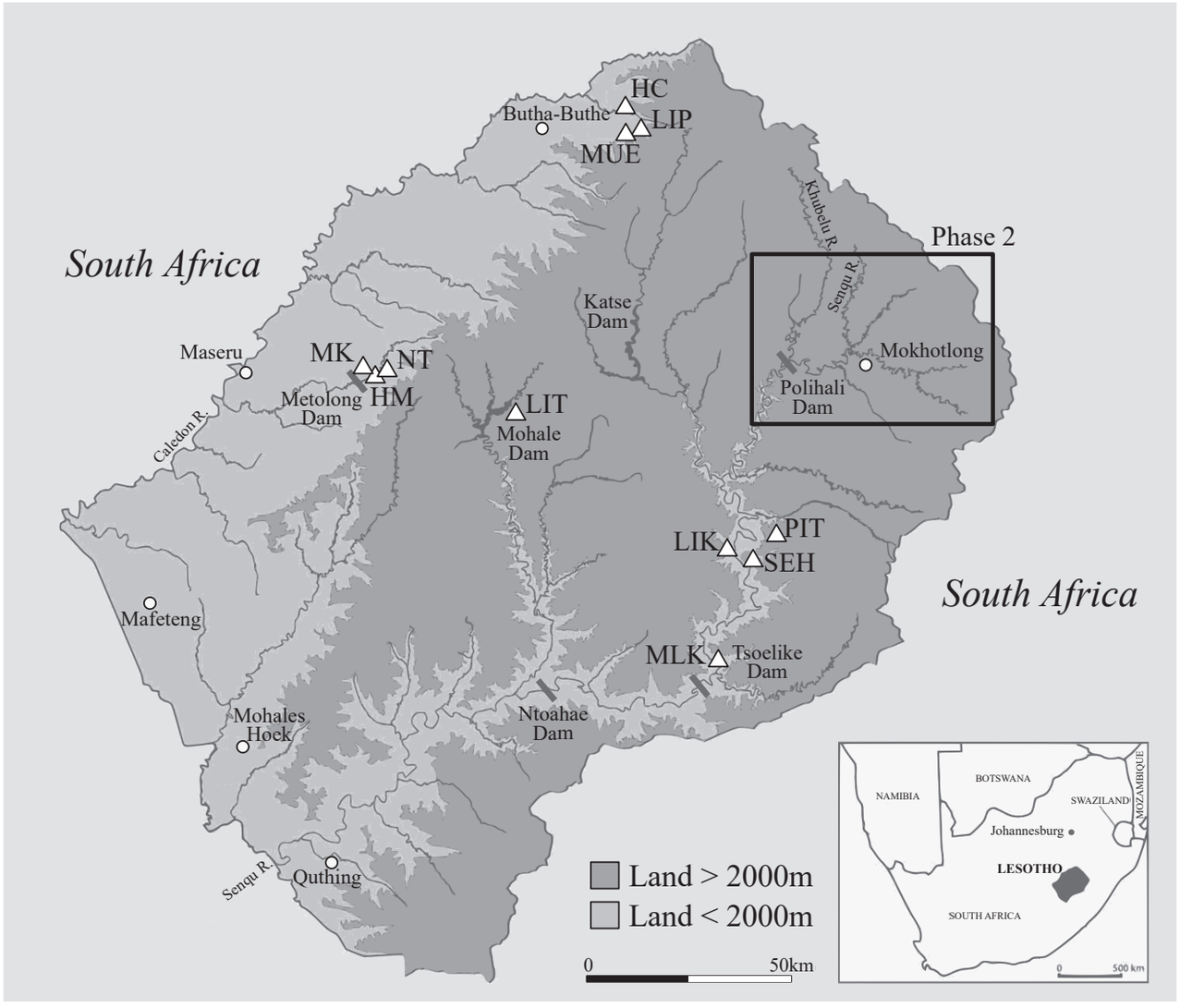

FIGURE 1 Lesotho and the Polihali Dam context (adapted from Kaplan & Mitchell 2012: 2): HC = Hololo Crossing; HM = Ha Makotoko; LIK = Likoaeng; LIP = Liphofung Cave; LIT = Lithakong; MK = Ha Makoanyane; MLK = Melikane; MUE = 'Muela; NT = Ntloana Tsoana; PIT = Pitsaneng; and SHE = Sehonghong

theoretical and methodological approaches in the field as a whole, including historical materialist approaches, stone tool technological analyses and genetic studies. However, our intention here is to consider foremost the work performed in relation to dam developments in Lesotho.

The Lesotho Highlands Development Authority (LHDA) is responsible for over-seeing dam developments within the country mandated by the Lesotho Highlands Water Project (LHWP). These reservoirs are developed for water transfer to South Africa's Gauteng Province where water demands exceed local storage capabilities. Discussions were first held in the mid-1950s, but only in 1978 was an agreement reached between the two governments to begin preliminary investigations. On 24 October 1986 a treaty was signed committing both countries to the development of a multi-phased dam project (see Mwanzi 2007; Haas et al. 2010). Probably the best known of these and the first developed is Katse Dam (Fig. 1). The steep-sided valley prohibited much human habitation and the development likely did not destroy any significant archaeology (Lewis-Williams & Thorp 1989; Arthur et al. 2011; Mitchell 2017). However, in the area of the following phase of development, the Polihali Dam, a baseline study performed by Hugo Pinto (CES 2014) located a large number of heritage sites. Of the 247 identified sites, over 40 were deemed to be of such high significance that they required mitigation. Many of these were below or near to Polihali Dam's Full Supply Level (FSL) of 2075 m above sea level (m a.s.l.), which means they will be or are at risk of being destroyed. The loss of this heritage would remove

from the archaeological record an unrivalled highlands resource, both in terms of Lesotho's national record as well as its international value.

A range of questions are currently under consideration, and these deal with issues of human connectedness, human-environment interactions, deep-time sequences, historical interactions, and settlement histories. For these questions to be answered, it is imperative that the data be recovered before doing so is no longer possible. To do so, an extensive excavation, surface collection, rock art documentation, and landscape mapping program has been initiated. Ahead of answering these questions, this paper situates Polihali Dam's five-year heritage program, which involves the most thorough archaeological investigation of all the previous phases of dam development, within a broader African and national context. We also present some preliminary data that sheds light on the region's archaeological sequence.

2 Dammed Heritage in Africa

Large-scale dam developments have the potential to provide employment, skills training and social support, and to alleviate poverty, especially in developing economies. However, among many other issues, concerns have been raised over the permanent inundation of heritage resources (Brandt & Hassan 2000) and the accelerated and irreversible destruction they cause (Arazi 2009). While tangible heritage is often the focus of mitigation programs, the lack of focus on intangible cultural heritage, such as memory, oral histories and traditions, is a real concern (cf. Schmidt 2000; King 2003; King & Nic Eoin 2014). Some of these issues may relate to the poor integration between national policies and heritage legislation, while the implementation of environmental and archaeological or heritage impact assessments is another worrying matter (Arazi 2009). All of these concerns, however, relate to the manner policies, legislation and developers relate to affected communities. Unfortunately, in most developments, this has resulted in conflict and discord between stakeholders (e.g. Brandt & Hassan 2000; Hafsaas-Tsakos 2011; Kleinitz & Näser 2011; Mitchell 2017).

One example that has led to a range of humanitarian, development and heritage-based issues is the Merowe Dam in Sudan. While over a dozen archaeology salvage missions were conducted by international archaeological teams, the net result was grossly underwhelming (Kleinitz & Näser 2011). Unfortunately, two separate stakeholder groups emerged: one including and associated with the developers and the other which included communities and human rights organisations. The conflicting agendas between these groups contributed to the abandonment of archaeological work, involuntary community resettlement and the mismanagement of cultural resources. Compounding this issue are often the foreign-led mitigation and development teams (Hafsaas-Tsakos 2011). Subsequently, the local community banned archaeologists from their land in an attempt to stifle the developers (Hafsaas-Tsakos 2011; Kleinitz & Näser 2011). While Merowe is one example, other African dams elsewhere have had issues of their own, and these include Lake Kariba (Zimbabwe) and Cahora Bassa Dam (Mozambique) along the Zambezi River; the Gilgel Gibe Hydroelectric Project, Ethiopia; and the largest man-made lake in the world by surface area, the Akosombo Dam along the Volta River, and Bui Dam, Ghana (Brandt & Hassan 2000: 25-43; Hassan 2007; Apoh & Gavua 2016). In all cases, both tangible and intangible culture heritage have been lost.

Although dams often destroy large heritage reserves, the intensive archaeological mitigation programs that precede them often result in the collection of tangible and, sometimes, intangible cultural heritage (Kleinitz & Näser 2013). Detailed mitigation work is crucial if we are to preserve the history and heritage of communities most directly affected by these kinds of developments. For example, mitigation ahead of Lesotho's Metolong Dam (see Fig. 1) led to incredibly exhaustive and well-funded research programs that provided archaeologists with significant resources enabling them to complete an extensive archaeological and community training program (Arthur 2018). In other examples, dams at the Thune River (Botswana) and in the Phuthiatsana Valley (Lesotho) drowned multiple rock art sites which made dating the art possible since it would have been destroyed either way (Bonneau et al. 2017). Moreover, these developments have the potential to support knowledge production in parts of Africa that often lack archaeological infrastructure and to promote skills development programs (e.g. Arthur & Mitchell 2012). Lesotho's dammed heritage is another example.

2.1 *Phase 1: Katse and Mohale Dam*

Work on the first phase of Lesotho's dams began in 1986 when the LHWP conducted a large-scale project feasibility study (see Table 1 for dam phases). Included in this was a heritage assessment that revealed rock art and stone tool scatters in the Tlhaka Dam area, near the 'Muela hydroelectric station (Lahmeyer MacDonald & Olivier Shand 1986). At this time, the results of the feasibility study represented the only known archaeological data from the Phase 1 areas. To investigate this further, David Lewis-Williams and Carolyn Thorp (1989) were contracted to

TABLE 1 Dam developments completed and proposed in Lesotho (adapted from Mitchell 2017: 163)

Dam development phases	Dam	River	High-water level (in m a.s.l.)
IA	Katse	Malibamatso	2053
IB	Mohale	Senqunyane	2075
II	Polihali	Senqu/Khubelu	2075
III	Tsoelike	Senqu	1764
IV	Ntoahae	Senqu	1645
V	Malatsi	Senqunyane	1660

perform a detailed assessment of the affected areas. They noted a lack of significant finds in the steep-sided valleys of the Malibamatso River, which was to be flooded by the Katse Dam during Phase IA. Further surveys in the 'Muela Reservoir area (Hololo and Khukhune Valleys) revealed additional sites as well as those at risk of vandalism (see Loubser & Brink 1992; Loubser 1993). This work led to three shelters being mitigated ahead of construction and inundation: Hololo Shelter (Mitchell & Parkington 1990; Mitchell et al. 1994), 'Muela Shelter and Liphofung Shelter (Kaplan 1995). The latter site was not to be impacted by any LHDA activities, but, because of the site's archaeological sequence, rock art, and its use by King Moshoeshoe I who resided in the shelter for a night (Ambrose 1988), it was identified as a candidate for a flagship cultural heritage centre.

In Phase IB, Kaplan (1995) identified nine sites – three with rock art – and excavated one, Lithakong Shelter (2061 m a.s.l.) in the basalt zone. The site was thought to be unique given that so few were recorded in the area by Parkington and Mitchell (1993) when surveying a road servitude; although only a small area around the road development was surveyed. Lithakong is also the only site in the Lesotho Formation (comprised primarily of basalt; Drakensberg Group, Karoo Supergroup) presently excavated. Radiocarbon results from three unidentified charcoal samples provided calibrated dates of AD 1040-1128, AD 1318-1450 and 3659-3379 BC (see Kaplan & Mitchell 2012: 6), indicating a lengthy occupation history. The site produced a small opaline-rich stone tool assemblage (N = 1546), with a large number of scrapers (N = 54) included in the formal tool assemblage (N = 67). No evidence of bladelet cores or bladelet manufacture exist, although a segment and backed bladelet were identified. Found in addition to stone tools were six worked bone tools and a single rim sherd and an iron point, the latter sourced from either KwaZulu-Natal or the eastern Free State's Caledon's Valley area. Additionally, faunal evidence from 'Muela and Liphofung, notably the presence of blue duiker (*Philantomba monticola*) and vervet monkey (*Chlorocebus aethiops*), seems to further suggest a KwaZulu-Natal or Eastern Cape link since neither species occurs in the Lesotho region (Kaplan & Mitchell 2012). The Polihali Dam is directly east of these sites and may be part of the exchange network transferring items westwards to populations living in these areas.

2.2 *Phase II: Polihali Dam*

The Polihali Dam development involves the damming of a large stretch of the Senqu and Khubelu Rivers, and some of the lower reaches of their tributaries. Pinto (CES 2014) was contracted by Coastal and Environmental Services to perform a baseline study of the dam's development footprint up to 2075 m a.s.l. (FSL). The aim of the survey was to create an inventory of all tangible and intangible heritage resources at risk. The survey involved recording heritage site types; their extent, location, artefact diversity and density; producing a photographic record of each site; and scribing any additional details worth noting. Based on these findings, each site was rated using three categories. The sites' scientific potential and significance was graded into highest, high, medium or low based on the type and density of artefacts and the site's preservation status (Table 2, CES 2014). The impact the dam would have on the site was categorised using the same terms. High indicates destruction of the site or it being within 100 m of the dam, medium indicates potential disturbance or within 100 and 250 m from the FSL and low indicates no disturbance or more than 250 m from the FSL.

In total, 247 tangible heritage resources were identified (Table 2). Of these, 149 were determined to be of high significance, which includes 89 grave sites and 60 occupation or activity sites. Twenty-three of these have high potential, significance and impact, and thus require mitigation. A further 18 sites have high significance and impact, but medium potential, although they were still recommended for archaeological mitigation by Pinto (CES 2014). Therefore, according to the baseline study, 41 sites were

TABLE 2 A breakdown of sites identified in the Polihali Dam Phase 1 report (from CES 2014: iii)

Site ratings	Stone Age and rock art	Agropastoralist communities	Cemeteries	Total
Sites by significance				
High	44	16	89	149
Medium	17	27	0	44
Low	13	41	0	54
Total	**74**	**84**	**89**	**247**
Sites by recommendation				
Proposed for further fieldwork	31	10	58	99
Proposed for monitoring	2	10	31	43
No further fieldwork proposed	41	64	0	105
Total	**74**	**84**	**89**	**247**

recommended for mitigation, and of these, 30 are Stone Age sites (of which nine contain rock art). The remaining sites are eight agropastoralist settlements (the topic of a forthcoming study) and three rock art-only shelters. Furthermore, Pinto (CES 2014) proposed an intangible cultural heritage program that should be carried out in tandem with the archaeological study. The purpose of this program is to place specific attention on the communities that will be relocated as a result of the dam and its associated developments. In conclusion, Pinto (CES 2014) stated that the baseline study indicates a high frequency and density of heritage-related tangible and intangible residues in Polihali's basalt zone.

2.3 *Phases III-V: Tsoelike, Ntoahae and Malatsi Dams*

Phases III to V will only be carried out when the need arises. Nonetheless, Lewis-Williams and Thorp (1989) visited the Phase III area for a preliminary three-day inspection and identified a number of heritage sites. They recommended that a larger-scale program be conducted in the region. Since then, and despite the LHDA recommending that such a program be completed "some ten years before construction begins" (LHDA 1989; cf. Mitchell 2017: 169), all work that has been conducted in the area has been for academic research purposes funded from private sources. Notable sites that occur here and further up the Senqu River are Melikane (Carter 1978), Sehonghong (Carter 1978; Mitchell 1996b), Pitsaneng (Hobart 2004), and Likoaeng (Mitchell et al. 2011). The former two shelters have more recently been dated using optically stimulated luminescence (Jacobs et al. 2008) and the Middle Stone Age (MSA) and Later Stone Age (LSA) assemblages have been re-examined (Stewart et al. 2012). Survey work within an hour's walking distance from Sehonghong has identified over 100 additional sites (Mitchell 1996a, 2017) and previous studies (e.g. Vinnicombe 1976; Carter 1978; Smits 1983) indicate that this area may be one of the richest hunter-gatherer archaeological landscapes in southern Africa (cf. Mitchell 2017). Up to 40 sites, which include occupation and/or painted shelters, open-air camps (including Likoaeng), and talus-slope assemblages at sites including Sehonghong and Pitsaneng, will be destroyed by rising water levels (Mitchell 1996a, 2010). Similar impacts are anticipated during Phases IV and V (Mitchell 2017). While this summary appears bleak, the reality is that the LHDA has taken a far more proactive approach to heritage conservation in Phase II than in Phase I.

3 The Archaeology of the Polihali Dam Area

PGS Heritage, a South African company with a Lesotho branch, was appointed to conduct and complete the mitigation program for the Polihali Dam development. The field team began by revisiting and rerecording all of the sites identified in the CES (2014) report that required mitigation (Fig. 2). The aim was to determine the extent of work necessitated at each site. A field team was established and included two professionally trained archaeologists and members of Arthur's (2018) field team who were trained through the Metolong Dam project (more on this below). Team structure was intended to avoid a hierarchal setup and not replicate a "colonially derived, director-labour model of organisation" (Arthur 2018: 2). As such, Tim Forssman and Rethabile Mokhachane collaborated closely on all matters relating to the recording and, later, excavation of the archaeological sites.

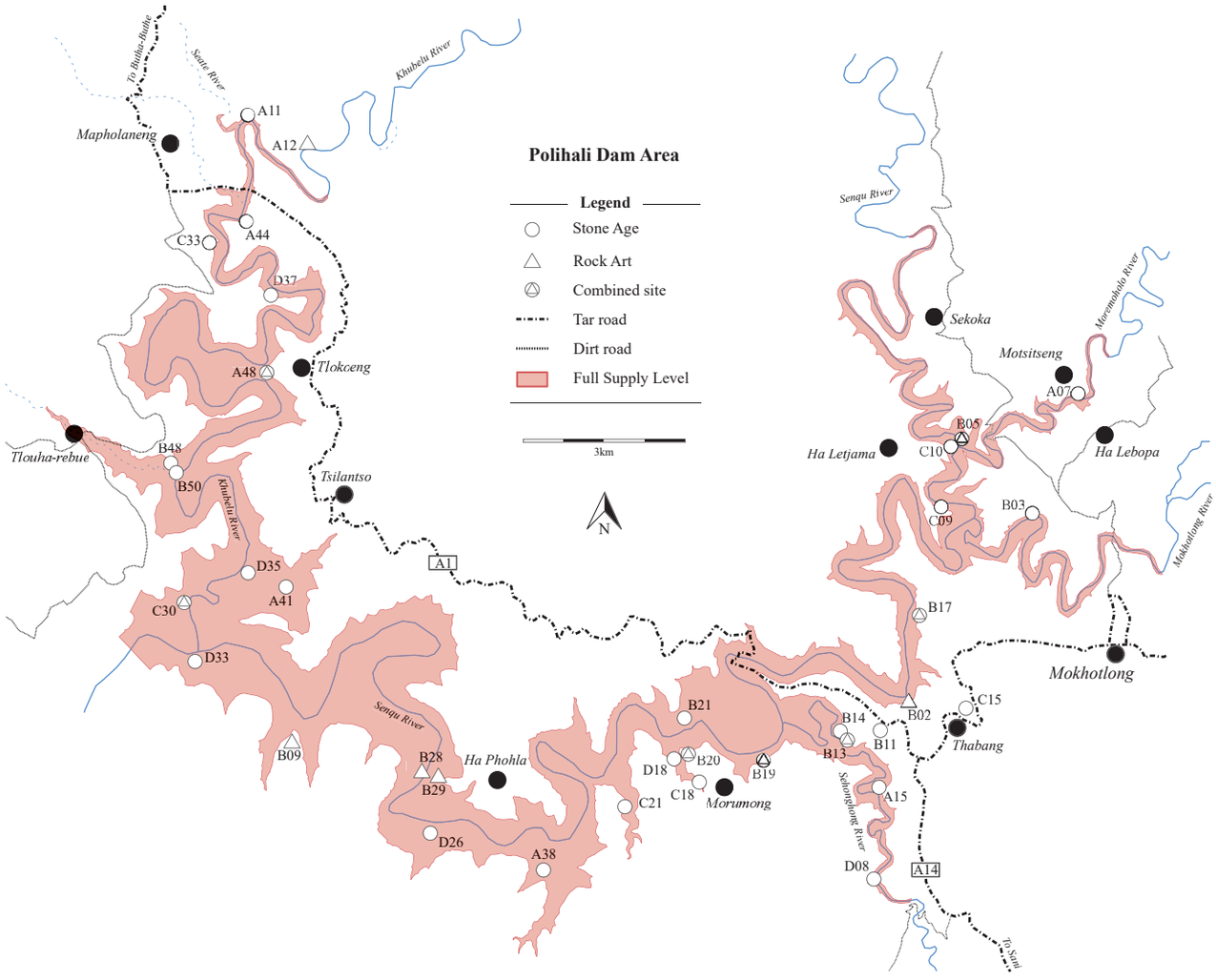

FIGURE 2 The distribution of investigated sites and the Polihali Dam Full Supply Level (FSL)

Stone Age sites were graded using a number of different variables all scaled from one to five (Table 3). This included: the number of excavated squares needed to recover an adequate archaeological assemblage; the presence of diagnostic artefacts; the density of artefacts at the site; the variety of cultural remains; and the deposit's depth and preservation. Using these results, the number of workdays required to complete the mitigation at each site was then calculated accordingly. Lastly, each of Pinto's (CES 2014) ratings for potential, significance and impact was given its own grading. For each category, the value taken was specifically weighted based on its assigned significance within the framework of this project (see Table 3 for these specific values). Combining the category figures and their value taken offered a maximum of 37.3 points from which a rating out of ten was calculated for each site with those above six considered high (N = 12). These variables and their ratings were selected because it was felt that they provided the best representation of the quality of the sites for the required mitigation program.

Site A48 offers a useful example of how this method works. The shelter contains a variety of artefacts, including rock art (assemblage diversity = $3 \times 0.5 = 1.5$), in a low-density scatter (artefact density = 1), which includes diagnostic finds such as formal tools and ceramics (cultural residues = $5 \times 2 = 10$). The deposit is well preserved and appears to be more than 1 m in depth (deposit = $5 \times 2 = 10$). The floor area is spacious (175 m^2) and it is estimated that 20 1×1 m squares could be excavated (excavatable squares = 4), which would require 100 days (required workdays = 4). In Pinto's (CES 2014) report, significance is highest (value = $4 \times 0.33 = 1.32$) and potential and impact ratings are high (value = $3 \times 0.33 = 0.99$ each). In total, the point value equals 33.8, which when divided by the possible total (37.3) and multiplied by ten, gives the site a rating of 9.06. These reassessments highlighted a number of interesting insights and patterns.

TABLE 3 An outline of the grading system used to rate each revisited site (HP = Pinto's rating scale, see CES 2014)

Category	Points					Value taken
	1	2	3	4	5	
Excavatable squares	0-5	6-10	11-15	16-20	>21	× 1
Required workdays	1-10	11-30	31-60	61-100	>100	× 1
Cultural residues	Absent	None diagnostic	Possible diagnostic	Formal artefacts	Diagnostic artefacts	× 2
Assemblage diversity	Absent	Single culture	Two basic types	Two cultures	Multiple cultures	× 0.5
Deposit	Absent	Eroded / shallow	Slight erosion	Intact, deep	Pristine, deep	× 2
Artefact density (/m^2)	0-5	6-10	11-30	30-50	>51	× 1
HP: Potential	Low	Medium	High	Highest	NA	× 0.33
HP: Scientific value	Low	Medium	High	Highest	NA	× 0.33
HP: Impact	Low	Medium	High	NA	NA	× 0.33

4 Stone Age Excavations

Of the 31 Stone Age sites identified by Pinto (CES 2014), the PGS team deemed four to have no discernible significance either due to a total lack of cultural remains or unavoidable damage to the deposit (e.g. erosion). These were sites B03, B11, C33 and D37 (see Fig. 2 for site locations). B02 was also not included because it contains only rock art and no excavatable deposit. However, an additional site was included for mitigation because it appeared to have been inadvertently left off the Phase 1 report's final list (C15), and in our assessment received a high rating (7.89). As such, 27 Stone Age sites were included in the mitigation list and all, except for one Early Stone Age (ESA) site which contained large bifacial cores, bifaces and an array of core management pieces, are LSA rock shelters or open-air sites, some with open-air components and agropastoralist residues. Specific patterns associated with these two site contexts are noteworthy.

4.1 *Shelter Sites*

The range of shelter sizes is fairly broad, but there are no extremely large shelters such as those in the lower Clarens or Molteno Sandstone Formations, like Sehonghong or Melikane (Carter 1978). Smaller, but still highly rated sites include A07 (6.69), C15 and D35 (6.07), all at 60 m^2 (Fig. 3). Another, D08 (8.39), is a low-lying, shallow shelter along Mokhotlong's Sehonghong River (there are two Sehonghong Rivers in Lesotho, the other is in the Thaba-Tseka District to the south). The shelter's area is estimated to be 85 m^2 (L: 17 m; D: 5 m) with a ceiling height of approximately 2 m. The site is protected by a slightly inclined talus slope that appears to be holding the deposit in place. In front of the site are modern agricultural fields and it is clear that present farmers use the site for cooking and refuge based on the presence of a modern hearth, crockery and site furniture. The site has a large surface assemblage estimated to be between 5 and 10 artefacts per square metre. It includes LSA artefacts, ceramics, a proliferation of grindstones and modern remains as well as a midden and hearth. The deposit is possibly deep and may yield a large assemblage and one that spans multiple periods.

Conversely, A48 is the largest identified shelter, with an approximate floor area of 175 m^2 (L: 25 m; D: 7 m) and a ceiling height of 12 m. This site also contains fine-lined rock art images and a large surface assemblage with a variety of artefacts, albeit in a low density (0-5 per m^2), including LSA stone tools, ceramics, grinding stones, subsistence remains and modern items. Pinto (CES 2014) estimated the deposit to be up to 2 m deep, but the field team felt that a more conservative figure was warranted based on the nearby appearance of bedrock (±1 m). However, going on current experience with deposit depth at sites already excavated (e.g. B05 and C15), the deposit may well be in excess of 2 m. Either way, the site is expected to yield a significant assemblage that will hopefully provide insights into the earlier LSA occupation phases of the region. Other larger shelters include B20 (6.83; 150 m^2), B19 (6.83) and B17 (5.31; both 144 m^2), C18 (6.16; 135 m^2) and B05 (8.53; 110 m^2; Fig. 4). Nonetheless, shelter size does not appear to be a deterrence for occupation or use and some of the smaller shelters that have been excavated (e.g. A07 and D35) yielded impressive and diverse assemblages which include bone tools, tooth and shell pendants, early to mid-Holocene Woodlot scrapers (see Mitchell 1994) and large faunal samples.

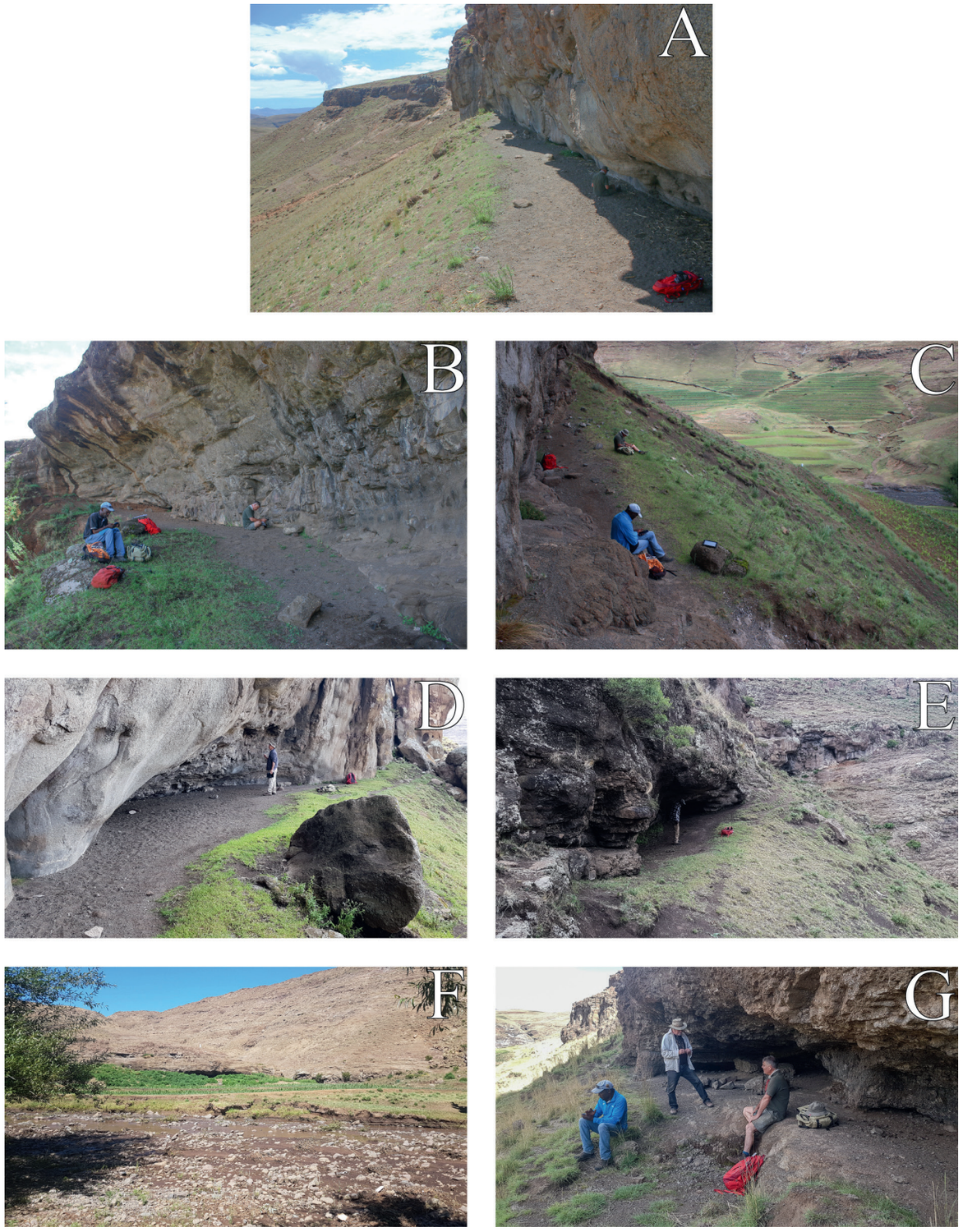

FIGURE 3 A selection of shelter sites to be mitigated: A = B20; B = B05; C = A07; D = A48; E = C15; F = D08; and G = C09
PHOTOGRAPHS BY TIM FORSSMAN

FIGURE 4 A closer view of B05 along the Senqu River. Excavations at the site are complete and analysis of the results has begun.
PHOTOGRAPH BY JEREMY HOLLMANN

FIGURE 5 A stone arrowhead found on D26's slope
PHOTOGRAPH BY TIM FORSSMAN

In most shelters it is the front slope that contains the highest density of remains. This is more than likely because of post-depositional processes leading to deposits exiting the shelter and artefacts migrating downslope. It is unknown to what extent this has altered the sites' archaeological value, or context, but in some instances, such as at C30 and D33, it appears significant. In other cases, for example C09 (5.04), D26 (5.53) or D37 (NA), it is possible that the site has been nearly entirely altered by erosional activities or even mostly 'flushed' out. At C09, Pinto (CES 2014) expected up to a meter of deposit, but the PGS field team did not envisage the deposit exceeding 20 cm in depth. This may be the result of erosional processes, which is in this case unfortunate since Pinto (CES 2014) rated C09 as one of the eight sites with the highest significance.

It is expected that artefacts on site slopes possess little value other than presence/absence data. First, the slopes are highly mobile contexts due to weathering processes and livestock mobility patterns. The position of artefacts is consequently in a constant state of flux. Second, achieving chronological control, other than broad swathes of time, may not be possible. Typological cross-referencing might be the only means available to do so. Third, and linked to this, is the possibility of mixing and an inability to separate the assemblages into their original units. It also may not always be possible to tell whether mixing has occurred, and, in such cases, typological cross-referencing will not yield accurate results. Nonetheless, such assemblages have the potential to provide artefact-type distributional data.

At C15 and D26 each, for example, a denticulated, tanged arrowhead was identified (Fig. 5). A similar arrowhead was found at Sehonghong but it was not denticulated (Mitchell 1996, 20). Other examples from around southern Africa exist (e.g. Humphreys 1984; Bradfield & Sadr 2011; Smeyatsky 2017) but most arrowheads have been retrieved within the Orange (Senqu) River watershed (Bradfield & Sadr 2011), which includes the Polihali area. It is possible these are emblematic and used in *hxaro* (reciprocal) gift exchange, which may indicate social value systems (Wiessner 1983), or they could have been used in hunting activities (Mitchell 1999). While a surface collection will be performed at D26, the artefact's exact chronology may not come to light due to the unsealed nature of the assemblage and lack of excavatable deposit. Nonetheless, it is possible that the arrowheads date to within the last 2000 years based on comparisons with dated examples (Mitchell 1999). Thus, despite the difficulties of extracting valuable information from slope assemblages, they retain the possibility of yielding potentially important data, especially if they contain artefacts as rare as arrowheads.

Another aspect noted at many of the Polihali shelters is their modern use, which presents a specific challenge. First, contemporary activities may have interfered with the upper layers of the deposit. As a result, the more recent cultural traces in the shelter are possibly disturbed and may not offer accurate insights into this aspect of the shelter's sequence. Similar issues have been noted elsewhere in Lesotho and South Africa (e.g. Hobart 2004; Pinto et al. 2018). Second, the field team's activities in these shelters disrupt people's lives. These spaces are still actively used and archaeological work within them will alter the site's social fabric and result in people having to use new or different spaces (for a discussion on this see Forssman & Louw 2018). Another arising issue is vandals targeting the excavated deposits (which occurred at A07, A35 &

FIGURE 6 A selection of open-air sites to be mitigated: A & B = A15; B: large flakes (top left), irregular core and chopper core (top right), possible bifaces (bottom left and right); C = B50 with the stone circle structures in front; and D = A41
PHOTOGRAPHS BY TIM FORSSMAN

B05). Collaboration with the intangible heritage team and communities is of utmost importance in navigating these social channels.

4.2 *Open-Air Sites*

Open-air sites present a number of issues such as contextual disturbances, artefact removal and a loss of chronological control (cf. Sadr 2009). For example, Site A41 (3.39) is an open-air LSA scatter found in and around agricultural fields along the Tsilantso River (see Fig. 2 and 6). A surface collection was carried out in a 6000 m² area (100 × 60 m) and 243 artefacts were collected. Of them, 86 (35.4%) were located within a 300 m² area inside an agricultural field. One artefact was found for every 3.4 m² outside the field, whereas inside there was one artefact per 36.3 m². The plough-zone therefore produced more artefacts than the surrounding zone, but it is the area with the highest disturbance. Other sites also located in ploughed zones include A15 (6.43), A38 (4.60) and C10 (4.86). These along with slope assemblages contribute a significant number of sites to the overall mitigation list. Open-air sites are therefore a large component of the Polihali fieldwork program.

Despite complications, open-air sites have the potential to provide valuable insights into past lifeways and archaeological distributions. One site that offers unrivalled insights into the highlands Stone Age is A15. As far as the authors are aware, it represents one of the few known ESA sites identified in Lesotho thus far. The only other sites were identified by Carter (1978) in the vicinity of Sehonghong and total eleven. Despite this, it is possible that A15 is the first ESA assemblage to be located within the upper highlands of the Lesotho Formation. Unfortunately, it too is located within and around a ploughed zone and so its chronology may be unknowable. Nevertheless, the team's investigations at the site, which will be accompanied by a geoarchaeological analysis and raw material source assessment, will provide the first insights into a Lesotho highlands ESA site.

Another noteworthy open-air site is B50. The site is located in the Khubelu River floodplain on a short, low spur formed where a small tributary meets the river. Within a fairly limited area, a high-density assemblage occurs and is flanked by possible site furniture. On the exposed floodplain below the spur are two stone structures, one forming a definite circle. Pinto (CES 2014) suggested that these might relate to the LSA occupation of B50 and argued that for this reason it is a unique site. Whether or not these two cultural remains are linked (which will be examined), the site does appear to be significant in terms of its location and artefact density. Its proximity to the river is likely to have had an effect on its preservation.

Therefore, open-air sites in the Polihali area include those that potentially offer deep-time understandings of past occupation sequences as well as insights into

hunter-gatherer occupation and settlement patterns. However, it is the combination of all of these site contexts that may lead to some very interesting results. Whereas typically study sites are selected based on research questions or a site's perceived value, in the Polihali area a full spectrum of different site types and site contexts will be examined. When viewed together, it is expected that these will help generate a fairly complete picture of prehistoric lifeways in the highlands region.

5 Rock Art Sites

A total of 13 rock art sites (between 1923 and 2247 m a.s.l.) were identified; twelve reported by Pinto (CES 2014) and one found by the PGS team. These are expected to contribute significantly to our understanding of the local sequence, especially because the occurrence of rock art sites on basalt above 1900 m a.s.l. was unexpected and surprising. Previous workers (Lewis-Williams & Thorp 1989) had suggested that rock art was absent from basalt environments, partly due to the belief that the occupation of the basalt regions by hunter-gatherers was sparse and transient and also because of the supposed unsuitability of basalt as a painting surface. Fieldwork at these sites indicated that the basalt surfaces are generally rough and mostly unsuitable for painting; all images occur on smaller and smoother rock facets. Generally, basalt surfaces are ~~also~~ more ~~or less~~ unstable. For example, at B20, fieldworkers witnessed the exfoliation of fragments of basalt. Weathering of the basalt is thus probably a major factor in the deterioration of the rock art in the surveyed area. Some of the overhangs are low in the valleys (Fig. 4), between 10 and 50 m from the current river course (e.g. A12, B05 and C29), while others occur higher up and on steep slopes (e.g. A48, B02, B19 and C30; Fig. 7).

In general, preservation of the rock art is poor, and, with a few exceptions, the painted images have largely disintegrated. Some sites (e.g. B13 and B19) comprise only fragmentary traces of red pigment. Other paintings have become obscured through the accumulation of white deposits, presumably precipitated calcite. Recording of rock art in this region has thus relied heavily on the use of image enhancement software (DStretch) as well as the use of the Lab colour space to reveal what painted details remain. In the case of site B20, where there are traces of a painted panel about 2.50 m wide, there is a copy, made by Patricia Vinnicombe (1976), in which more of the now extremely fragmentary details can be seen.

With the exception of two sites (B09 and B17, more recent, finger-painted sites), the rock art may be broadly

FIGURE 7 The location of B19 above the Senqu River. Slightly downstream, but not in this image, is B20. The white marker at the bottom of the image indicates the 2080 m a.s.l. contour, 5 m above Full Supply Level
PHOTOGRAPH BY JEREMY HOLLMANN

characterised as hunter-gatherer art with marked similarities to rock art sites further down the Senqu River and elsewhere in the Maloti-Drakensberg (Smits 1973, 1983, 1988; Vinnicombe 1976). There may be two possibly temporally or culturally distinct painting traditions in the surveyed area, but these may also overlap chronologically. Paintings of eland, in red and white (the white pigment is now mostly absent), and a couple of polychrome eland (A48 and B05), are stylistically similar to paintings of eland further down the Senqu River (e.g. Sehonghong) and at sites throughout the Maloti-Drakensberg and its foothills. There is possibly a single instance of a rear-view perspective painting of an eland at site A48 (Fig. 8). This particular eland motif occurs widely in the Maloti-Drakensberg and adjacent foothills (e.g. Battiss 1948: 210-211; Pager 1971: Fig. 371; Vinnicombe 1976: ii, Fig. 105a, 105b and 106), and it seems that the bichrome and polychrome eland depictions belong within this broad category. Mazel (2009) has argued that the start of the polychrome painting technique in the uKhahlamba-Drakensberg dates back to about 2000 BP, but this may be earlier (Bonneau et al. 2017) and may have continued until the production of rock art in the area ceased. Eland images recorded in the Polihali Dam survey may therefore be temporally and, possibly, culturally distinct productions from another stylistically distinct category of motifs found in the same area – paintings of horses with armed riders, as well as depictions of cattle.

There are two sites (B02 and B20, both on the Senqu River) that feature images of people on horseback (Fig. 9). The panel of rock art at B20 copied (but unpublished) by Patricia Vinnicombe has already been mentioned;

FIGURE 8 Examples of eland from C29 (left; enhanced with DStretch) and possible rear-view motif of an eland from A48 (right)
PHOTOGRAPHS BY JEREMY HOLLMANN

amongst other images, the copy records a galloping horse rider (parts of which are still visible) and a single bovid. At B02, are two pairs of horse riders that look very similar to the riders depicted at sites further south at Melikane and in the Tsoelike River valley. Horse (and cattle) imagery is also characteristic of the rock art at lower altitudes in the foothills of the uKhahlamba-Drakensberg around Underberg and to the south (Vinnicombe 1976: 9-108, Fig. 15, 25; Challis 2009, 2012, 2014). These horse riders are often depicted galloping and with weapons such as rifles and long bladed spears and some of them sport topknots (e.g. Vinnicombe 1976: Fig. 252). The paintings at B02 may fall within this category of image as one of the riders has a topknot hairstyle, another carries what is probably a rifle, while a third figure is shown carrying what appear to be two large bladed spears. These accoutrements are all part of a 'package' of painted attributes that Challis (2009, 2012, 2014) has argued depict AmaTola raiders who were present in the Maloti-Drakensberg in the mid-19th century. The presence of this art in the upper reaches of the Senqu River may thus extend the known range of this social formation.

Paintings of figures in black pigment are another feature of the surveyed rock art (Fig. 10). These figures are depicted both in groups and individually at a few of the sites along the Senqu River (B02, B28 and B29). Similar black figures are prominent further south, especially at the archaeological site of Pitsaneng near Sehonghong (e.g. Hollmann 2016: Fig. 5.66-5.68) and are often painted at sites at which horses, horse riders (sometimes also painted in black) and cattle occur (e.g. Sehonghong and Melikane).

The style and content similarities of the survey area paintings with other areas in the Lesotho highlands and the wider Maloti-Drakensberg region extend the distributional range of these motifs into the basalt region of the highlands. Certain elements in the art sequence of this area are, however, absent. The practice of superpositioning, in which one image is painted over another (e.g. Pager 1971: 327, 353-356; Lewis-Williams 1974; Vinnicombe 1976: 137-143; Russell 2000; Swart 2004), has not been observed in the survey area. With one possible (but doubtful) exception at site B28, no therianthropic imagery has been recorded either. Elsewhere in the Maloti-Drakensberg, therianthropes are widespread though not numerous. There is also no overt trance imagery, such as nasal bleeding (Lewis-Williams 1981a: 77), the bending forward, arms back posture (Lewis-Williams 1981a: 88), dance imagery, or motifs such as the thin, red, painted lines that link images to each other (Lewis-Williams 1981b; Lewis-Williams et al. 2000). The fauna depicted is very limited and no clear paintings of rhebuck (or other small antelope species), baboons or serpents were recorded. These kinds of imagery do occur in the lower altitude rock art sites in the Lesotho highlands as well as elsewhere in the Maloti-Drakensberg (e.g. Vinnicombe 1976:194-201, 222-227, 228-237). Also absent from the repertoire of rock art motifs are more recent images of shield-carrying figures (Vinnicombe 1976: Fig. 37 and 38); these are a feature of the rock art at Sehonghong and elsewhere in the highlands such as Likoaeng (Challis

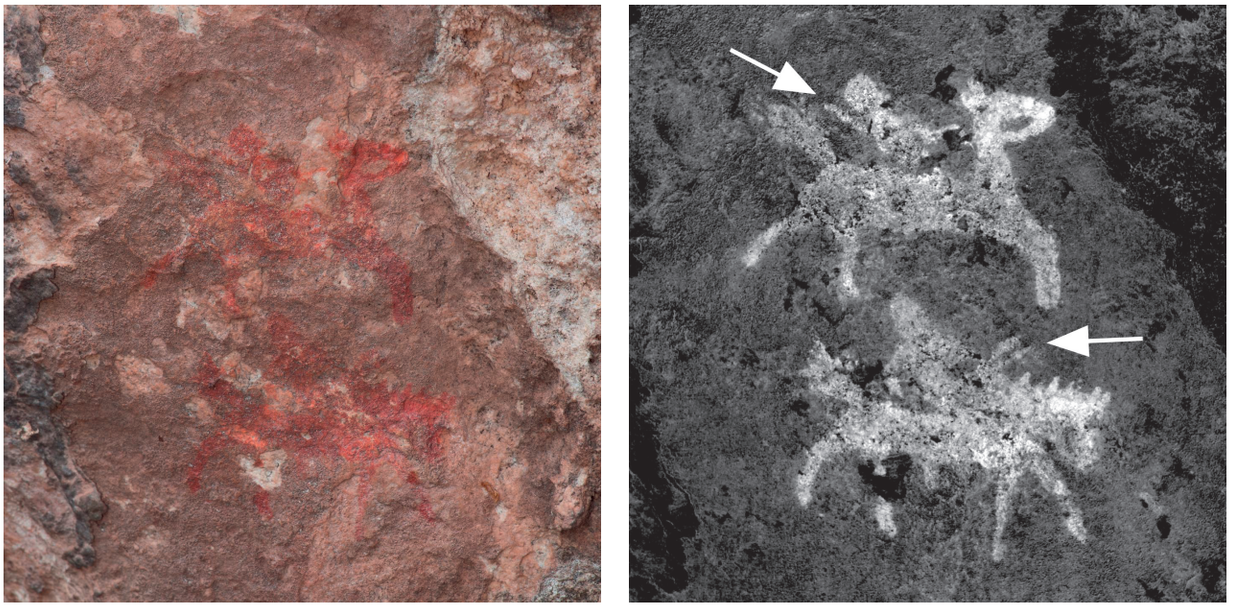

FIGURE 9 People on horseback at B02 (righthand image in grayscale). Arrows indicate weapons carried by horse riders.
PHOTOGRAPHS BY JEREMY HOLLMANN

et al. 2008), but none have been identified in the Polihali Dam survey area. The reasons for the absence of these motifs, which are common elsewhere in the Maloti-Drakensberg, needs to be investigated.

6 Researching the Archaeology of the Polihali Dam Survey Area

The heritage program for the Polihali Dam is the most thorough and detailed project associated with a LHDA dam destined to deliver water to Gauteng. It is instructive to compare and contrast this current program with the most recent heritage study carried out in Lesotho, the Metolong Dam, built to supply water to Maseru 30 km east. Metolong did not face the same challenges as the Polihali development. It was in a much smaller area, there were no villages or burial grounds scheduled for inundation, and a significant amount of archaeological research had already been conducted in the region (e.g. Smits 1983; Mitchell & Steinberg 1992; Mitchell 1993, 1994; Jacobs et al. 2008). It was this awareness of the presence of archaeological sites that made a strong case for the need of heritage management. Before beginning archaeological work at Metolong, the World Bank-funded project took into consideration the criticism levied at Phase I of the LHDA (e.g. Hoover 2001) and the suggestions made by various scholars, including Mitchell (2005). Accordingly, an action plan was developed that focused not only on the tangible and intangible

FIGURE 10 Black figures from B28 similar to those found at Pitsaneng, approximately 50 km downstream
PHOTOGRAPHS BY JEREMY HOLLMANN

cultural heritage of the region, but also on community involvement and development, and the national development of capacity for archaeological heritage management (also see Arazi 2011). The results of the Metolong excavations have not been fully published as they are the focus of Charlie Arthur's doctoral thesis (2018). In the meantime, Mitchell, Arthur and other members of the project have published on several matters related to the Metolong Dam project (Mitchell & Arthur 2010, 2012), some of which discuss its archaeology and field program (Arthur & Mitchell 2012; King et al. 2014; Mitchell & Arthur 2014; Arthur et al. 2018), and others the intangible cultural heritage aspects of the project (Nic Eoin & King 2013; King & Arthur 2014; King & Nic Eoin 2014).

Lessons from Metolong have been incorporated into LHDA protocols and have informed the framework of the Polihali Dam program. Although the project design is task based, the intentions of the team as well as the expectation of the client is that research questions are brought into the program and answered through peer-reviewed publications. This is positive considering that generally it has not been a key deliverable for Lesotho dam projects (cf. Mitchell 2017). That this aspect of the project has been flagged as an important portfolio is highly beneficial since the Polihali landscape is notably understudied, and yet it is adjacent to well-studied areas such as around Sehonghong and ~~in~~ KwaZulu-Natal~~,~~ and even areas south of Lesotho in the Eastern Cape (Mitchell & Whitelaw 2005). The range of sites in the Polihali area indicates that the lack of local archaeological research is not a consequence of an absence of evidence. Instead, the presence of archaeological remains suggests a complex occupation sequence in the area, and probably in other basalt areas that may one day be, or have already been, subjected to inundation. The research team has identified a number of questions and topics that are thought worthy of pursuance as the project moves forward with heritage mitigation work.

The first is to address the archaeological representation of the region. At present, the occupation sequence of the Polihali area is mostly unknown. We now know that there are ESA (A15) and LSA (as well as isolated and surface MSA finds) assemblages, but the chronological range of these complexes has not been established. It is expected that a clear understanding of the LSA sequence will be developed, considering the number of sites to be excavated (N = 26), but possibly not of the earlier periods. Regarding the Stone Age assemblages, a typological and technological analysis will be performed, allowing for cross-referencing between regions and assemblages. Determining assemblage characteristics, technological traits as well as formal tool and core morphology are expected to assist with understanding the nature of the region's occupation, and perhaps broad landscape patterns. The same may be so for the rock art sequence, which contains possibly two 'styles'.

One of the central topics to be examined is interconnectedness between people operating within the highlands and with the nearby lowlands. Essential to this are questions involving seasonality, and more generally, mobility. The Senqu River is the largest river to form part of the Polihali Dam. Downstream, some 50 km from where the dam wall will be situated, are Sehonghong, Likoaeng, Pitsaneng, and further along, Melikane. The river connects the Polihali region directly to what Mitchell (2017) describes as was once possibly the most densely occupied hunter-gatherer areas in southern Africa. Having a direct channel to this region might have favoured settlement or at least access to the Polihali landscape. Already, indications of long-distance networks and transhumance have been identified: at A07, a *Conus* shell pendant was identified and would have come from the Indian Ocean coast, at least 200 km south-east; A07 and B05 which contained ostrich eggshell beads, an exotic item since ostriches are not indigenous to the area (the shell may have come from the Free State or KwaZulu-Natal Provinces; e.g. Kaplan & Mitchell 2012); and A07 and D35 which contained glass beads from the Indian Ocean trade network (Wood 2012). The motivations for leaving the low-lying sandstone areas, which are only slightly below the basalt zone, or for exchanging goods into the Polihali area, are topics to be explored.

It may be that seasonal occupations of the Polihali area resulted in the region's settlement. In Plug et al.'s (2010) study at Likoaeng, for example, seasonality was extrapolated from fish remains. Already, excavations in the Polihali area (at B05 and D35) are producing large amounts of both adult and juvenile fish bones. Notably, B05, like Likoaeng, is along the Senqu River. Bone and age-category distribution has not been examined and so it cannot be said yet whether these remains indicate exclusive summer visits, but the juvenile fish certainly indicates that hunter-gatherers were in the area during summer months, possibly in addition to winter. These data will be coupled with other faunal information gathered elsewhere, such as eland behavioural ecology and lambing cycles (Skinner & Chimimba 2005), to further extrapolate visitation periods.

Perhaps the most lasting impact, and certainly the most visual, is the loss of landscape in the Polihali area. Presently, the region's valleys, floodplains, recesses, slopes and flat areas are actively used and part of the daily lives of people who live in local communities. As the archaeology appears to indicate, this was the case in the past as well. It was in these spaces that landscapes and lives intersected. Tangible traces remain, and intangible cultural heritage persists, and yet this will soon be disturbed by rising water levels. These are currently accessed and accessible places and the reservoir will permanently interrupt these patterns and landscape use cycles. Despite the country's prominence in our understanding of southern Africa's archaeological past, Lesotho's eastern basalt highlands are understudied and now we face losing what appears to be a significant heritage landscape. As such, the importance of these investigations and documentations and forthcoming studies cannot be understated.

7 Final Remarks: Early Reflections and African Contexts

Despite the Polihali project being in its infancy, it provides early insights into an archaeological sequence that has seen almost no previous research and serves as a positive model for dam development programs in Africa. The research has already identified several important patterns that will be studied further. Perhaps the most crucial finding is the general abundance of archaeological remains, including rock art, on a landscape considered marginal. The span of Stone Age traces is particularly encouraging. Already it indicates a very lengthy presence of hunter-gatherer communities, although it is not yet known whether this was on a permanent or episodic basis. That downstream from the Polihali landscape along the Senqu River one finds a swathe of some of Lesotho's most prominent archaeological sites (Likoaeng, Melikane, Pitsaneng and Sehonghong), and given the connections to the South African coastline (suggested by the conus pendant from A07), the study area is perched along a dynamic and expansive social network of sites. Whether these are connected through seasonal patterns, exchange networks, or traversing pathways such as the river channels are topics to be explored. These more detailed queries are underscored by the general need to identify basic chronologies, cultural representations and histories for the region.

Perhaps, though, it is the maturity expressed in the overall design of this project that is most encouraging. There has been concentrated effort to avoid rehearsing the problems associated with the Katse Dam project or any other dam development that has been completed or attempted in Africa. First, a strong intangible cultural heritage program has been designed to operate in tandem with the archaeological investigation. The intangible cultural heritage program also includes the development of sustainable livelihoods as a component. Second, the field teams are structured in collaborative formats with co-leaders who share responsibilities and input when it comes to the field program. This promotes local skills development and community engagement. Third, employing members of the local community and working alongside a community liaison officer has reduced the risk of tensions arising among local villages and communities. Regular contact with communities through public gatherings attended by the community liaison officer and team leaders has made it possible to amicably resolve any matters that arise as they appear. Finally, as discussed above, a robust research program has been designed around the task-based nature of the heritage management goals. However, the project still draws heavily on non-local specialists. This is ultimately due to a lack of local capacity and heritage infrastructures capable of taking on a project of this scale. Where possible, though, local specialists have been brought into the mitigation program. While the lack of local development is disheartening, the project's positive direction represents a concerted effort to ensure that a responsible approach to archaeological and intangible cultural heritage is championed.

Acknowledgements

We would like to acknowledge the support provided by our client, the Lesotho Highlands Development Authority, and local community officials and representatives in the Polihali Dam area. Rethabile Mokhachane, Puseletso Lecheko, Pulane Ntunya, Trent Seiler, Saul Blankstone, Joseph Uhlar, Guy Quittenton and Joseph Ralimpe assisted the field team when visiting the sites during the pilot field assessments and thereafter. In addition to this, Marko Hutten is thanked for logistical support. We thank two anonymous reviewers and Peter Mitchell for their insightful comments and assistance with an earlier draft.

References

Ambrose, D.P. 1988. *Report on the Hololo Valley Historical Site 'Liphofung'*. Unpublished report. Prepared for the Lesotho Highlands Development Authority.

Apoh, W. & Gavua, K. 2016. "We will not relocate until our ancestors and shrines come with us": heritage and conflict management in the Bui Dam Project area, Ghana. In: Schmidt, P.R. & Pikirayi, I. (eds.), *Community Archaeology and Heritage in Africa: Decolonising Practice.* Routledge, London, pp. 204-223.

Arazi, N. 2009. Cultural research management in Africa: challenges, dangers and opportunities. *Azania: Archaeological Research in Africa* 44 (1), 95-106.

Arazi, N. 2011. Safeguarding archaeological cultural resources in Africa – policies, methods and issues of (non) compliance. *African Archaeological Review* 28 (1), 27-38.

Arthur, C. 2018. *The Social World of Hunter-Gatherers in Early Holocene Lesotho: Integrating Method and Theory.* Ph.D. thesis, Oxford University.

Arthur, C. & Mitchell, P.J. 2012. The Metolong Dam: a lasting legacy? *The Digging Stick* 29 (2), 4-8.

Arthur, C., Mitchell, P.J. & Mohapi, M. 2011. Developer funded archaeology and the impact of dam projects in Lesotho.

Conservation and Management of Archaeological Sites 13 (2-3), 231-252.

Arthur, C., Mitchell, P.J., Dewar, G. & Badenhorst, S. 2018. After the silt: middle and later Holocene hunter-gatherer archaeology of the Metolong Dam, Lesotho. *Southern African Humanities* 31, 129-179.

Battiss, W. 1948. *The Artists of the Rocks*. Red Fawn Press, Pretoria.

Bonneau, A., Pearce, D., Mitchell, P.J., Staff, R., Arthur, C., Mallen, L., Brock, F. & Higham, T. 2017. The earliest directly dated rock paintings from southern Africa: new AMS radiocarbon dates. *Antiquity* 91 (356), 322-333.

Bradfield, J. & Sadr, K. 2011. Stone arrowheads from Holkrans, North West Province, South Africa. *South African Archaeological Bulletin* 66 (193), 77-88.

Brandt, S.A. & Hassan, F. 2000. *Dams and Cultural Heritage Management*. Working paper submitted to the World Commission on Dams.

Carter, P.L. 1978. *The Prehistory of Eastern Lesotho*. Ph.D. thesis, University of Cambridge.

Challis, W. 2009. Taking the reins: the introduction of the horse in the nineteenth-century Maloti-Drakensberg and the protective medicine of baboons. In: Mitchell, P.J. & Smith, B. (eds.), *The Eland's People: essays in memory of Patricia Vinnicombe*. Witwatersrand University Press, Johannesburg, pp. 104-107.

Challis, W. 2012. Creolisation on the nineteenth-century frontiers of southern Africa: a case study of the AmaTola 'Bushmen' in the Maloti-Drakensberg. *Journal of Southern African Studies* 38 (2), 265-280.

Challis, W. 2014. Binding beliefs: the creolisation process in a 'Bushman' raider group in nineteenth-century Southern Africa. In: Deacon, J. & Skotnes, P. (eds.), *The Courage of // kabbo: Celebrating the 100th Anniversary of the Publication of Specimens of Bushman Folklore*. UCT Press, Cape Town, pp. 247-264.

Challis, W., Mitchell, P.J. & Orton, J. 2008. Fishing in the rain: control of rain-making and aquatic resources at a previously undescribed rock art site in Highland Lesotho. *Journal of African Archaeology* 6 (2), 203-218.

Coastal Environmental Services (CES) 2014. *Lesotho Highlands Water Project Phase II: LHDA Contract 6002. Report of baseline archaeological and heritage survey*. Unpublished report. Prepared for the Lesotho Highlands Development Authority.

Forssman, T. & Louw, C. 2018. The space of flow at Telperion Shelter: the rock art of a recycled, reused and reimagined place. *Time and Mind* 11 (2), 185-208.

Haas, L.J.M., Mazzei, L. & O'Leary, D.T. 2010. *Lesotho Highlands Water Project: communication practices for governance and sustainability improvement*. World Bank, Washington D.C.

Hafsaas-Tsakos, H. 2011. Ethical implications of salvage archaeology and dam building: the clash between archaeologists and local people in Dar al-Manasir, Sudan. *Journal of Social Archaeology* 11 (1), 49-76.

Hassan, F.A. 2007. The Aswan High Dam and the International Rescue Nubia Campaign. *African Archaeological Review* 24 (3-4), 73-94.

Hobart, J. 2004. Pitsaneng: evidence for a neolithic Lesotho? *Before Farming* 4, 1-10.

Hollmann, J.C. 2016. A glimpse into the archaeology of the Qing-Orpen sites. In: De Prada-Samper, J.M., Du Plessis, M., Hollmann, J.C., Weintroub, J., Wintjes J. & Wright, J. (eds.), *On the trail of Qing and Orpen*. Standard Bank, Johannesburg, pp. 123-157.

Hoover, R. 2001. *Pipe Dreams: the World Bank's Failed Effort to Restore Lives and Livelihoods of Dam-Affected People in Lesotho*. International Rivers Network, Berkeley.

Humphreys, A.J.B. 1984. Sociable arrows. *The Digging Stick* 1, 2-3.

Jacobs, Z., Roberts, R.G., Galbraith, R.F., Deacon, H.J., Grün, R., Mackay, A., Mitchell, P.J., Vogelsang, R. & Wadley, L. 2008. Ages for the Middle Stone Age of southern Africa: implications for human behavior and dispersal. *Science* 322 (5902), 733-735.

Jolly, P.A. 1995. Melikane and Upper Mangolong revisited: the possible effects on San art of symbiotic contact between south-eastern San and southern Sotho and Nguni communities. *South African Archaeological Bulletin* 50, 68-80.

Kaplan, J. 1995. *Archaeological Reconnaissance of Mohale and Matsoku*. Unpublished repor. Prepared for the Lesotho Highlands Development Authority.

Kaplan, J. & Mitchell, P.J. 2012. The archaeology of the Lesotho Highlands Water Project Phases 1A and 1B. *Southern African Humanities* 24 (1), 1-32.

King, R. & Arthur, C. 2014. Development-led archaeology and ethics in Lesotho. *Azania: Archaeological Research in Africa* 49 (2), 166-183.

King, R. & Nic Eoin, L. 2014. Before the flood: loss of place, mnemonics, and 'resources' ahead of the Metolong Dam, Lesotho. *Journal of Social Archaeology* 14 (2), 196-223.

King, R., Arthur, C. & Mitchell, P.J. 2014. Ho Makoanyane: the archaeology and history of colonial transitions in Lesotho. *Southern African Humanities* 26 (1), 57-81.

King, T.F. 2003. *Places That Count: traditional cultural properties in cultural resource management*. AltaMira Press, Walnut Creek.

Kleinitz, C. & Näser, C. 2011. The loss of innocence: political and ethical dimensions of the Merowe Dam archaeological salvage project at the Fourth Nile Cataract (Sudan). *Conservation and Management of Archaeological Sites* 13, 253-280.

Kleinitz, C. & Näser, C. 2013. Archaeology, development and conflict: a case study from the African continent. *Archaeologies: Journal of the World Archaeological Congress* 9, 162-191.

Lahmeyer MacDonald Consortium & Olivier Shand Consortium 1986. *Lesotho Highlands Water Project Feasibility Study. Supporting Report C: environmental and social impact in Lesotho*. Government of Lesotho, Maseru.

Lesotho Highlands Development Authority (LHDA) 1989. *Lesotho Highlands Water Project – Phase 1A: draft environmental action plan*. Lesotho Highlands Development Authority Environmental Division, Maseru.

Lewis-Williams, J.D. 1974. Superpositioning in a sample of rock-paintings from the Barkly East District. *South African Archaeological Bulletin* 29 (115-116), 93-103.

Lewis-Williams, J.D. 1981a. *Believing and Seeing: symbolic meanings in southern San rock paintings*. Academic Press, London.

Lewis-Williams, J.D. 1981b. The thin red line: southern San notions and rock paintings of supernatural potency. *South African Archaeological Bulletin* 36, 5-13.

Lewis-Williams, J.D. & Thorp, C. 1989. *Archaeology: Lesotho Highlands Water Project environmental study*. Unpublished report. Prepared for the Lesotho Highlands Development Authority.

Lewis-Williams, J.D., Blundell, G., Challis, W. & Hampson, J. 2000. Threads of light: re-examining a motif in southern African San rock art. *South African Archaeological Bulletin* 55, 123-136.

Lombard, M., Wadley, L., Deacon, J., Wurz, S., Parsons, I., Mohapi, M., Swart, J. & Mitchell, P.J. 2012. South African and Lesotho Stone Age sequence update (I). *South African Archaeological Bulletin* 67, 123-144.

Loubser, J.H.N. 1993. *Provisional Report on the Conservation of Fourteen Painted Rock Shelters affected by Phase IA of the Lesotho Highlands Water Project*. Unpublished report. Prepared for the Lesotho Highlands Development Authority.

Loubser, J.H.N. & Brink, J.S. 1992. Unusual paintings of wildebeest and zebra-like animals from north-western Lesotho. *Southern African Field Archaeology* 1 (2), 103-107.

Mazel, A.D. 2009. Unsettled times: shaded polychrome paintings and hunter-gatherer history in the southeastern mountains of southern Africa. *Southern African Humanities* 21 (1), 85-115.

Mitchell, P.J. 1993. Archaeological investigations at two Lesotho rock-shelters: the terminal Pleistocene/ early Holocene assemblages from Ha Makotoko and Ntloana Tsoana. *Proceedings of the Prehistoric Society* 59, 39-60.

Mitchell, P.J. 1994. The archaeology of the Phuthiatsana-ea-Thaba Bosiu Basin, Lesotho, southern Africa: changes in Later Stone Age regional demography. *Antiquity* 68 (258), 83-96.

Mitchell, P.J. 1995. Revisiting the Robberg: new results and a revision of old ideas at Sehonghong Rock Shelter, Lesotho. *South African Archaeological Bulletin* 50, 28-38.

Mitchell, P.J. 1996a. The late Quaternary landscape at Sehonghong in the Lesotho Highlands, southern Africa. *Antiquity* 70 (269), 623-638.

Mitchell, P.J. 1996b. The Late Quaternary of the Lesotho highlands, southern Africa: preliminary results and future potential of ongoing research at Sehongnhong Shelter. *Quaternary International* 33, 35-44.

Mitchell, P.J. 1999. Pressure-flaked points in Lesotho: dating, distribution and diversity. *South African Archaeological Bulletin* 54, 90-96.

Mitchell, P.J. 2002. *The Archaeology of Southern Africa*. Cambridge University Press, Cambridge.

Mitchell, P.J. 2005. Managing on Scarce Resources: The Past Record, Present Situation and Future Prospects of Archaeological Resource Management in Lesotho. In: Finneran, N. (ed.), *Safeguarding Africa's Past: Selected Papers from a Workshop Held at the School of Oriental and African Studies, University of London, 2001*. British Archaeological Reports, Oxford, pp. 37-46.

Mitchell, P.J. 2010. Making history at Sehonghong: Soai and the last Bushman occupants of his shelter. *Southern African Humanities* 22 (1), 149-170.

Mitchell, P.J. 2017. Dammed if you do, damned if you don't: archaeology and the Lesotho Highlands Water Project. In: Ndoro, W., Chirikure, S. & Deacon, J. (eds.), *Managing Heritage in Africa: who cares?* Routledge, London, pp. 161-176.

Mitchell, P.J. & Arthur, C. 2010. Archaeological fieldwork in the Metolong Dam Catchment, Lesotho, 2008-10. *Nyame Akuma*, 74, 51-62.

Mitchell, P.J. & Arthur, C. 2014. Ha Makotoko: Later Stone Age Occupation across the Pleistocene/Holocene Transition in Western Lesotho. *Journal of African Archaeology* 12 (2), 205-232.

Mitchell, P.J. & Parkington, J.E. 1990. *The Archaeology of the Hololo Crossing Rock-Shelter*. Report submitted to the Lesotho Highlands Development Authority.

Mitchell, P.J. & Steinberg, J.M. 1992. Ntloana Tsoana: a Middle Stone Age Sequence from Western Lesotho. *South African Archaeological Bulletin* 47, 26-33.

Mitchell, P.J. & Whitelaw, G. 2005. The archaeology of southernmost Africa from c. 2000 BP to the early 1800s: a review of recent research. *Journal of African History* 46 (2), 209-241.

Mitchell, P.J., Parkington, J.E. & Yates, R. 1994. Recent Holocene archaeology in western and southern Lesotho. *South African Archaeological Bulletin* 49, 27-56.

Mitchell, P.J., Plug, I. & Bailey, G. 2006. Spatial patterning and site occupation at Likoaeng, an open-air hunter-gatherer campsite in the Lesotho Highlands, southern Africa. *Archaeological Papers of the American Anthropological Association* 16 (1), 81-94.

Mitchell, P.J., Plug, I., Bailey, G.N., Charles, R.L., Esterhuysen, A.B., Lee Thorp, J.A., Parker, A.G. & Woodborne, S. 2011. Fishing at the place of the tobacco plants: a high resolution open-air record of late Holocene hunter-gatherers from highland Lesotho. *Antiquity* 85 (330), 1225-1242.

Mwanzi, O. 2007. Hydropolitics, ecocide and human security in Lesotho: a case study of the Lesotho Highlands Water Project. *Journal of Southern African Studies* 33 (1), 3-17.

Nic Eoin, L. & King, R. 2013. How to develop intangible heritage: the case of Metolong Dam, Lesotho. *World Archaeology* 45 (4), 653-669.

Pager, H. 1971. *Ndedema: a documentation of the rock paintings of the Ndedema Gorge*. Akademische Druck, Graz.

Parkington, J.E. & Mitchell, P.J. 1993. *Archaeological Impact of Road Construction in the Phase IB Area of Lesotho Highlands Water Project*. Unpublished report. Prepared for the Lesotho Highlands Development Authority.

Pinto, H., Archer, W., Witelson, D., Regensberg, R., Edwards Baker, S., Mokhachane, R., Ralimpe, J., Ndaba, N., Mokhantso, L., Lecheko, P. & Challis, W. 2018. The Matatiele Archaeology and Rock Art (MARA) program excavations: the archaeology of Mafusing 1 Rock Shelter, Eastern Cape, South Africa. *Journal of African Archaeology* 16 (2), 1-22.

Plug, I., Mitchell, P.J. & Bailey, G.N. 2010. Late Holocene fishing strategies in southern Africa as seen from Likoaeng, highland Lesotho. *Journal of Archaeological Science* 37, 3111-3123.

Russell, T. 2000. The application of the Harris Matrix to San rock art at Main Caves North, KwaZulu-Natal. *South African Archaeological Bulletin* 55, 60-70.

Sadr, K. 2009. Marine shell dates and surface lithic assemblages on the west coast of South Africa. *Journal of Archaeological Science* 36, 2713-2729.

Schmidt, P. n.d.. Human rights, culture, and dams: a new global perspective. In: Brandt, S.A. & Hassan, F. (eds.), *Damming the Past: dams and cultural heritage management*. Lexington Books, Lanham, pp. 79-90.

Skinner, J.D. & Chimimba, C. 2005. *The Mammals of the Southern African Sub-Region*. Cambridge University Press, Cambridge.

Smeyatsky, I. 2017. *Discerning and explaining shape variations in Later Stone Age tanged arrowheads, southern Africa*. M.Sc. thesis, University of the Witwatersrand.

Smits, L.G.A. 1973. Rock-painting sites in the upper Senqu valley, Lesotho. *South African Archaeological Bulletin* 28, 32-38.

Smits, L.G.A. 1983. Rock paintings in Lesotho: their content and characteristics. *South African Archaeological Bulletin* 38, 62-76.

Smits, L.G.A. 1988. Recording and deciphering of rock paintings in Lesotho. *Bollettino del Centro Camuno di Studi Preistorici* 24, 93-98.

Stewart, B.A., Dewar, G.I., Morley, M.W., Inglis, R.H., Wheeler, M., Jacobs, Z. & Roberts, R.G. 2012. Afromontane foragers of the Late Pleistocene: site formation, chronology and occupational pulsing at Melikane rockshelter, Lesotho. *Quaternary International* 270, 40-60.

Swart, J. 2004. Rock art sequences in uKhahlamba-Drakensberg Park, South Africa. *Southern African Humanities* 16 (1), 13-35.

Vinnicombe, P. 1976. *People of the Eland*. University of Natal, Pietermaritzburg.

Wiessner, P. 1983. Style and social information in Kalahari San projectile points. *American Antiquity* 48 (2), 253-276.

Wood, M. 2012. *Interconnections: glass beads and trade in southern and eastern Africa and the Indian Ocean – 7th to 16th centuries* AD. Ph.D. thesis, Uppsala University.