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■ KENYA

Recent Archaeological Survey and Excavation Around the Greater Kalokol Area, West Side of Lake Turkana: Preliminary Findings

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Introduction

After the long period of arid conditions in the terminal Pleistocene, the global climate turned to wet and humid at the onset of the Holocene Interglacial ~10 ka BP (Gasse 2000; Hassan 1997). Under the wet and intermittently dry conditions of the early Holocene (10-6 ka BP), lakeshores, seashores and rivers became attractive for human exploitation in many parts of the world (Erlandson 2001). In Africa, sites associated with aquatic intensification have been reported in the Sahelian-Saharan belt, dating roughly from 9500-5000 years BP (Holl 2005). The Turkana Basin in northern Kenya became a megala-ke in the early Holocene, with abundant aquatic resources and lush grasslands for hunter-fishers to exploit (Abel 1982; Butzer 1980). Early Holocene sites containing microliths, bone harpoons and pottery have been documented in the basin, the majority of them from the east side of the lake (Barthelme 1985; Phillipson 1977; Robbins 1974).

The first evidence for early Holocene human settlement in West Turkana was reported from the Dilit area (formerly described as Kabua, Figure 1) in the early 1960s by a Durham University expedition (Whitworth 1965). The Durham team located extensive lacustrine deposits bearing harpoon points, lithics and pottery. Although the Durham expedition established the Dilit area as a promising place, no archaeological research has been carried out in the region since. Lothagam was the second locality to be discovered after Dilit, and is the only well described lakeshore site in West Turkana (Robbins 1974). The importance of the Lothagam site is that it suggests

lakeshore “intensification”, possibly in response to increased aridity toward the middle Holocene. West Turkana experienced over 25 years of research hiatus in Holocene archaeology since the conclusion of Larry Robbins’ work at Lothagam and other localities in the early 1980s.

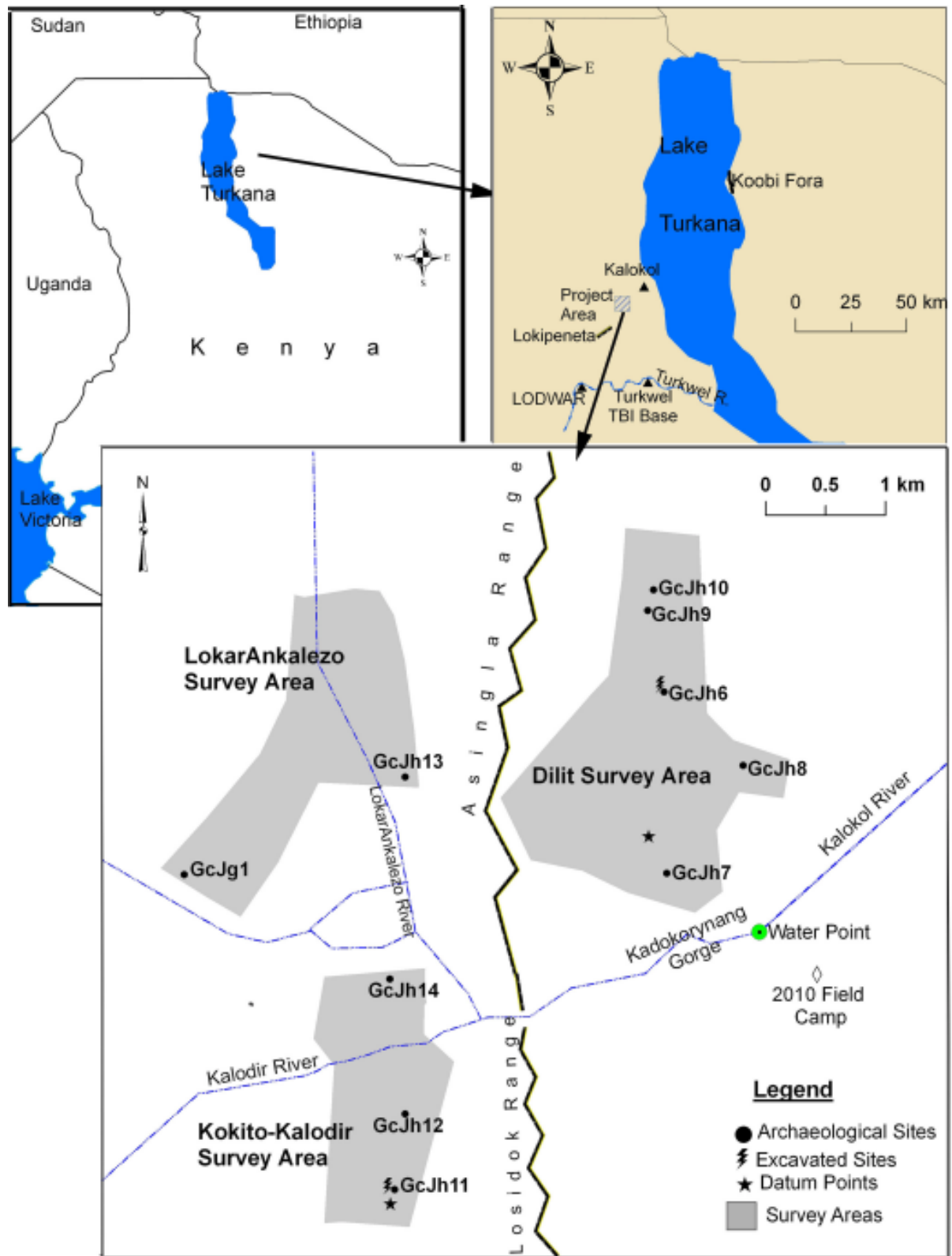
A renewed archaeological exploration of West Turkana has resumed since 2007 by the Later Prehistory of West Turkana (LPWT) team (Shea and Hildebrand 2010). In Fall 2010, the present researcher, an affiliate of the LPWT, conducted archaeological exploration around the Greater Kalokol Area, West Turkana (Figure 1). This is part of a long-term project aiming at locating early Holocene lakeshore settlements and examining their cultural and ecological contexts. The recent fieldwork documented ten sites, two of which were test excavated. This report briefly describes the preliminary archaeological findings from the sites.

Overview of the Survey Areas and Research Methods

The recent study focused on three localities, namely Dilit, LokarAnkalezo and Kokito, all situated within 420–480 meters above sea level (masl), and 15-20km inland from the modern lakeshore (Figure 1). The Dilit survey area extends from the Kadokorynang water hole northward along a series of low ridges and erosional gullies featuring mollusk beds and gravelly-sand deposits. The LokarAnkalezo-Kokito study area (4-7km southwest of the Dilit area) encompasses low terrains that descend west from the Losidok-Asingla range and two prominent riverbeds called Kalodir and LokarAnkalezo. A gallery of palm trees grows along the river banks. Undifferentiated alluvium, pockets of Galana Boi sediments and fossiliferous deposits characterize the general landscape. The Losidok-Asingla range (480-520masl, north-south trending hills) is cut by the Kadokorynang Gorge, which leads to the Kalokol River starting at the Dilit area towards the lake (Figure 1).

Noting that Lake Turkana rose up to 90m above its present level during the early Holocene high stand (now it is 365-370masl around Kalokol), traces of human settlements belonging to this period are likely to be found around lacustrine deposits situated 440-500masl. The focal areas were selected based on their

Figure 1: Map showing the project area and location of sites documented by the recent survey.



altitudinal range at the frontiers of the presumed early Holocene high lake stand, and their position adjacent to topographically inviting landscapes for human habitation, such as flat terrains and river banks. During periods of high lake stand, the Dilit, LokarAnkalezo and the Kalodir basins may have formed a single peninsula ringed by the Losidok-Asingla plateaus and the vast Kapua plains on the west. The Holocene deposits around Lake Turkana are collectively referred to as the Galana Boi Formation, characterized by mollusk rich silt, sand and pebbly gravel (Feibel 2003). Most of these deposits have been eroded, and they are visible as isolated pockets at the study areas overlying gritty silt-mud sediments.

The survey involved Geographic Positioning System (GPS) assisted pedestrian walking, focusing on low flat ridges and terminal lakeshore sediments (distinguished by mollusk beds). The accuracy of our GPS was usually less than 3m. The survey team consisted of the author, two assistants from the National Museum of Kenya, two students from the University of Nairobi, and two locals. A total of ten sites and several isolated finds were documented in Dilit, Kokito and LokarAnkalezo study areas. Test excavations were carried out at Dilit and Kokito. Standard procedures were followed during excavation and sediments were dry sieved using a 0.4cm mesh. The units were dug using arbitrary levels of 10, 15 and 20cm depending on artifact density.

The Dilit Sites

A four-day pedestrian survey in this area resulted in the discovery of five sites, described below.

Dilit 01 (GcJh6). Is located on a deflated, shelly-sand and gravel beach deposit (~13,000 sq m in area), gently descending to small erosional channels on the western and northern peripheries. This was the most intensively investigated site during the field season, owing to its diverse surface evidence (Figure 2). Terrestrial and aquatic faunal remains, lithics (microliths, cores and scrapers) and undecorated pottery were uncovered in varying concentration from surface and subsurface contexts. Four harpoon points (two nearly complete and two fragmentary) were also discovered on the surface (Figure 2).

A systematic surface collection of faunal and lithic remains was made from a 10x10m grid on an

eroding slope on the western section of the site (Figure 2). A few diagnostic artifacts (e.g., harpoon points and microliths), teeth and articular elements of long bones were collected from surface via a non-systematic manner. While the presence of rich terrestrial faunal remains implies human consumption of terrestrial animals, the discovery of harpoon points suggests some degree of aquatic resource exploitation. A few non-diagnostic ceramic sherds were recovered from surface and subsurface contexts.

Dilit 02 (GcJh7). This is a find-spot of scattered large tools: cleavers, picks and parti-bifacial handaxes on a gently sloping gravelly-sand surface (Figure 2). It is located about 1 km northwest of the Kadokorynang water point, and covers roughly 4000sq m. All the tools were made on lava. A few fossilized bones were observed around the handaxe find-spots, although not in direct association. Other Plio-Pleistocene Acheulian sites have been discovered from a similar elevation farther north in West Turkana, such as Lokalale (Roche et al. 1999) and Nariokotome (Walker 1994). Thus the Dilit large cutting tools may signify analogous Plio-Pleistocene hominid adaptation in the area. No surface collection was made in order to preserve the integrity of the site for future studies.

Dilit 03 (GcJh8). Situated on top of a steep sandy ridge, this site revealed widely scattered surface lithics on an eroding sandy substrate. The lithic sample, which is entirely made on chert raw material, consists of non-diagnostic debitage and a few characteristic prismatic blades and cores. Nineteen lithic artifacts were plotted and surface sampled. No faunal remains were discovered at the site so far.

Dilit 04 (GcJh9). This site lies about 800m north of Dilit 01 on a highly deflated level surface adjacent to the Ayanayedome River channel. The archaeological evidence consists of widely scattered lithic artifacts (e.g., scrapers and edge damaged tools) on chert raw material with no clear surface distribution pattern. As in Dilit 03, faunal remains and technologically diagnostic tools (harpoons or microliths) were not found.

Dilit 05 (GcJh10). Located on a diffused blow-out (erosional depression), this is a find-spot of decorated pottery and sparsely distributed obsidian debitage. The pottery fragments display red/orange slip and a variety of decorative motifs. The sherds

Figure 2: Surface collection at Dilit 01 (GcJh06) site: a) controlled (10x10 m grid) surface collection and sediment screening; b) distal metapodia (bovid), c) tooth (bovid), d) blade (chert), e) core (chert), f-g) uniserial bone harpoons.

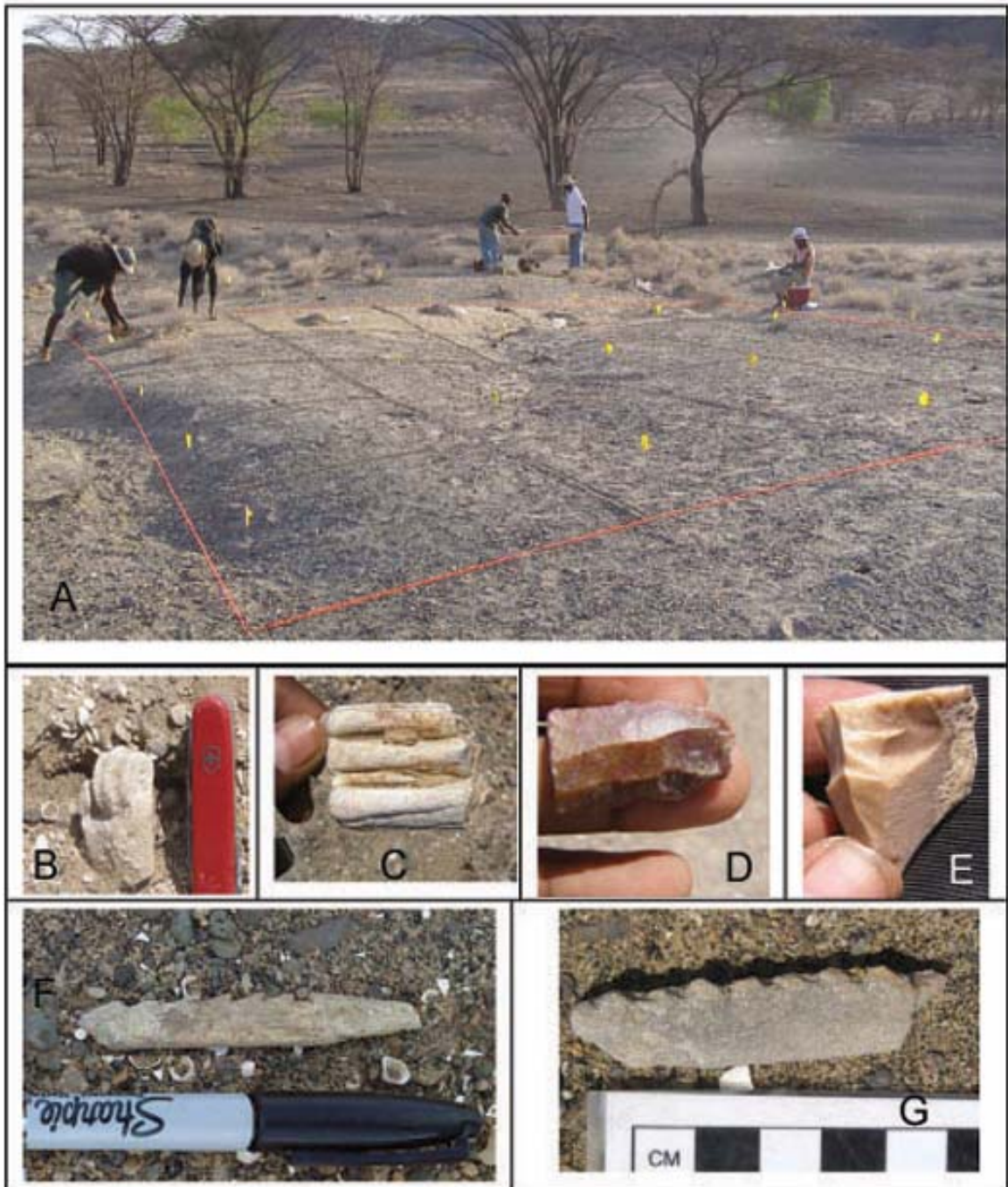


Figure 3: Large bifacial tools on lava (Acheulian sensu lato) from Dilit 02 (GcJh 07) site. All from surface.



are tentatively dated to the Iron Age (Kate Grillo, personal communication).

The Kokito Sites

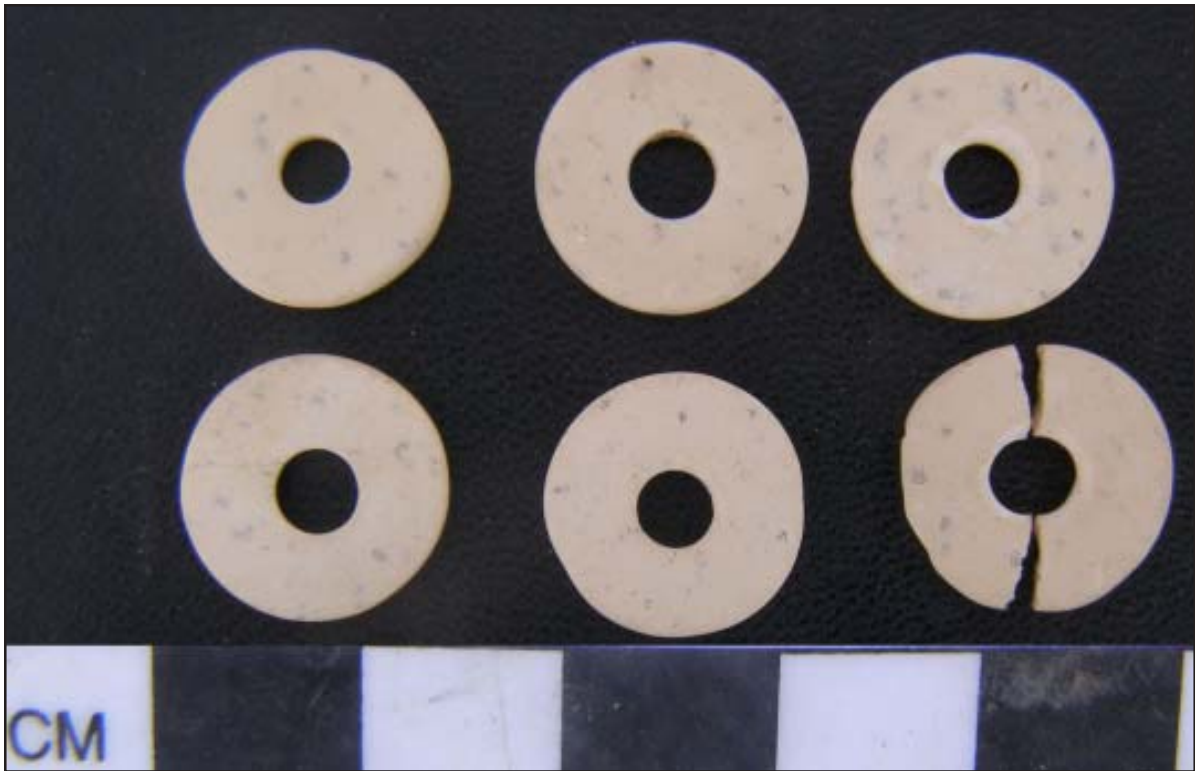
A two-day survey around the Kokito area, encompassing the eastern frontiers of the Kalodir Basin, located three sites discussed below.

Kokito 01(GcJh11). This is the most intensively investigated site in the Kokito study area, and one with rich aquatic faunal remains. It is situated on a north-south trending low ridge adjacent to a small dry channel and a steep hill. The surface is covered with lava rubbles and coarse gravels that over-lay loose silty sediments and compact clay layers re-

spectively. The shelly deposit (presumably early-mid Holocene in age) extends up to 50cm below surface. The location of the site at about 450masl and the presence of mollusk beds, which one can only assume were formed by an aqueous/lacustrine environment, make the site particularly important with regard to the project's main goals.

Work at Kokito 01 involved systematic surface collection and three test excavations. The systematic surface collection was made from a 4x4m grid laid on a gently tilted surface characterized by dense bone cluster and a modest artifact scatter. The lithic assemblage consists of typical microliths, prismatic and bipolar (anvil) cores and debitage entirely made on chert. The site preserves abundant fish remains, and

Figure 4: Ostrich eggshell beads from LokarAnkalezo 01 (GcJh13) site.



a modest quantity of terrestrial mammalian bones. Fish remains and harpoon points clearly indicate that the Kokito 01 site was associated with aquatic resource exploitation.

Kokito 02 (GcJh12). Located about 1 km north of Kokito 01, this is a find-spot of several harpoon points, and scattered skeletal remains of aquatic and terrestrial fauna. The site is on a flat gravelly terrace adjacent to a dry river channel to the east. It covers an area of ~300sq m, extending about 20m in diameter. Harpoon and bone fragments were observed on an eroding surface, along the edge of the river-terrace. The site reveals very sparse lithic artifacts, most of them non-diagnostic debitage. The discovery of harpoon points in direct surface association with fish remains signifies that the site was occupied by fisher groups, most likely at a later period after the Kikito 01 settlement.

Kalodir 01 (GcJh14). A brief survey along the peninsular penepain at the confluence of the Kalodir and LokarAnkalezo Riverbeds, located one site characterized by scattered lithic artifacts on the summit

of a steep ridge. We did not encounter any trace of harpoon artifacts or faunal remains, and no surface collection was made from the site. Generally, the lithic material resembles that of Kokito 01 finds in terms of raw material source (chert being dominant), but the debitage specimens appear larger and typical microliths are not present.

The LokarAnkalezo Sites

This survey area includes some low alluvium outcrops (with isolated mollusk beds) along the eastern and northern tributaries of the LokarAnkalezo tributaries (Figure 1). A two-day survey located two sites and numerous large mammalian fossil remains.

LokarAnkalezo 01 (GcJh 13). This is a find-spot of 10 ostrich eggshell beads (Figure 4) on a level gravelly surface, about 100m east of the LokarAnkalezo River terrace. It covers a 10x5m area. The majority of the beads were complete. Unprocessed eggshell pieces were not found suggesting that the site was not used for bead processing.

Figure 5: Stratigraphy of the two main excavation areas: a) Kokito 01 (GcJh11) Unit A, b) Dilit 01 (GcJh06) Unit A. Both units produced diagnostic backed tools made on chert.



LokarAnkalezo 02 (GcJg 01). This site produced a single harpoon fragment, and thinly scattered artifacts and terrestrial faunal remains on a series of deflated sandy ridges. It extends about 110m east-west and 50m north-south with some portions of the intermediate area lacking archaeological traces. The lithic finds include microliths, edge damaged tools and debitage, all made on chert.

Another briefly visited area during the recent fieldwork includes the northern tributaries of the Lokipeneta Plateau, characterized by a series of low hills and gullies that descend northward to the Kalodir Basin adjoining the western foothills of the Losidok Range. Even though characteristic sites were not identified, a one day survey there located several isolated lithic artifacts and abundant sites of chert bed-

rock. Future research will clarify if the inhabitants of the sites just reported have exploited those chert sources.

Summary of Excavation at Dilit 01 and Kokito 01 Sites

Dilit 01 (GcJh6). Two Units (A and B) were excavated to different depth and width at Dilit 01. Unit A was excavated to 120cm below surface and produced a total of 1514 bone remains (dominantly terrestrial species), 174 lithics and 16 pottery fragments. The excavated deposit is characterized by loose sandy-gravel sediments with a modest association of shells, signifying a typical lakeshore environment (Figure 5). Faunal and artifactual traces

Figure 6: Uniserial bone harpoons points: a-b) Kokito 01 surface, c) Kokito 01 Unit A subsurface, ~ -17 cm, d) surface harpoon sample from Kokito 02 (GcJh12).



(lithics and pottery) were recovered up to -110cm. Notably, while the quantity of faunal remains has steadily decreased downward, more lithic artifacts were recovered from the lower strata. A quick look at the field catalogue shows that the number of lithic artifacts increased from 22 in level 1 (0-15cm) to 41 in level 8 (75-90cm), 30 in level 9 (90-105cm) and 38 in level 10 (105-120cm). Among the artifacts uncovered from the lower strata were some diminutive microliths and a few chert nodules. The sherds are non-diagnostic (no decorative motifs or rims) with coarse-medium temper and light gray slip.

Unit B was excavated on a level section about 34m west of Unit A. It was excavated to -80 cm, and produced lithics (most of them non-diagnostic debitage) and some undecorated pottery up to -70cm. Four harpoon remains (two fragmentary and two nearly complete) were found on the surface within the unit's boundary. The substrate exhibits compacted clay and gravelly-sand matrix with a modest association of shells. Pockets of marl (-23cm) and diatomite (-50cm) layers were exposed in this unit. The sherds lack decorative motifs, displaying fine-medium temper.

Kokito 01 (GcJh11). Three units (A, B, C) were excavated on a low gravelly ridge. All the excavated units exhibit soft silt sediments on the upper

layers, grading to compact dark clay matrix downward, which also becomes dominantly yellow-brown at the lower levels.

Unit A was the most intensively investigated trench at this site and one that yielded the largest archaeological assemblage. It was excavated to 95cm on a 2x2m square. The shelly matrix extends up to 50cm below surface (Figure 5). The unit produced dense faunal remains dominated by fish bones; lithics (including typical microliths) and a few pieces of bone harpoons recovered *in situ* (Figure 6). In addition to the abundant fish remains, the aquatic faunal assemblage also contains tortoise and crocodile remains.

Unit B (1x2 m) was placed on an eastward tilting surface on the northern edge of the gravelly mound. It was excavated to -50cm (using 15cm levels), and yielded modest quantities of faunal and cultural remains up to -30cm. Excavation terminated at -50cm because faunal and artifactual remains were absent below -30cm.

Unit C (1x1m) was placed on a gravelly level section around a harpoon find-spot west of Unit A and south of Unit B. Lithic evidence was scarce in this unit, whereas faunal remains were recovered throughout most of the excavated deposit up to -45cm.

Table 1: List of sites registered by the recent archaeological survey around the Greater Kalokol Area, West Turkana.

Site Name (SASES)	Provenience in UTM, WGS84			Archaeological observation	Archaeological activity
	Easting	Northing	Elevation		
Dilit 01 (GcJh6)	808428.28	384021.21	442.1	Harpoon points, lithics, bones, pottery	Two excavation units opened
Dilit 02 (GcJh7)	808453.95	382510.71	438.7	Scattered handaxes (large cutting tools) and a few fossilized bones	No collection. Representative specimens plotted and photographed
Dilit 03 (GcJh8)	809089.85	383410.07	467.3	Lithic artifact scatter	19 lithic artifacts plotted and collected
Dilit 04 (GcJh9)	808288.62	384697.85	455.3	Lithic artifact scatter	23 lithic artifacts plotted and collected
Dilit 05 (GcJh10)	808335.27	384870.51	455.3	Decorated Pottery and lithic scatter	14 Lithics and 16 sherds collected
Kokito 01 (GcJh11)	806187.01	379869.78	453.5	Harpoon points, lithics, bones	3 Excavation units opened
Kokito 02 (GcJh12)	806272.6	380500.48	431.4	Harpoon points, bones, a few lithic scatter	Three harpoons, a tooth and a few bones collected
LokarAnkalezo 01 (GcJh13)	806264.58	383307.42	445.2	Ostrich Eggshell bead only	One complete and 2-frags collected
LokarAnkalezo 02 (GcJg1)	804419.77	382488.26	468.1	Harpoon points, lithics and bone	No collection
Kalodir 01 (GcJh14)	806141.25	381621.55	480.3	Lithic artifact scatter	No collection

Dating

Two charcoal samples from Kokito 01 (GcJh11) Unit A were submitted to the Illinois State Geological Survey Radiocarbon Laboratory (Hong Wang, director) for AMS dating. Sample 1 (ISGS A1714) collected from a cultural layer at -25 cm produced a radiocarbon age of 9785 ± 35 years calibrated to $11,217 \pm 16$ BP. Sample 2 (ISGS A1715) collected from a cultural layer at -16 cm produced a radiocarbon age of 9060 ± 30 years calibrated to $10,227 \pm 13$ BP. In addition to representing the oldest secured AMS dates for early Holocene sites in West Turkana, these dates provide key age reference for Lake Turkana's high stand after the terminal Pleistocene aridity.

General Conclusions

The project was successful in documenting archaeological sites associated with early Holocene aquatic intensification on the western shores of Lake Turkana. The majority of the sites were located between 430 and 460masl on lakeshore geological contexts, offering an ideal opportunity to examine patterns of human adaptation during the early Holocene high lake stand. Notably, several of the registered sites produced evidence suggestive of aquatic adaptation (harpoons and fish bones). The main cultural finds at the sites were lithics preferentially knapped from chert. Microliths, which are considered the hallmark of Later Stone Age tradition in sub-Saharan Africa, form the most diagnostic entities of the lithic assemblages. The two excavated sites show distinct patterns in that, while aquatic fauna dominates the Kokito assemblage, the Dilit finds are represented mainly by terrestrial fauna and thereby signifying differences in subsistence strategies. Moreover, pottery has not been discovered at the Kokito sites, whereas the two excavated units at Dilit have produced a few ceramic sherds. The large cutting tools found at Dilit 02 (GcJh7) (Figure 2) indicate the potential of the area for discovering Pleistocene sites. In reporting secured AMS dates, the study contributes important information to the later prehistoric archaeology of the Turkana Basin. Analysis of the faunal and cultural findings from the focal sites is planned for summer 2011.

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