Early prehistory of Isle of Skye and adjacent areas
2008-2010

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with contributions by

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Data Structure Report

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1. Summary *Karen Hardy*

This report covers 3 years work. In 2008 and 2009 preliminary seasons of test pitting were carried out, both to obtain radiocarbon dates for a series of shell middens, and to familiarise the Catalan participants with the local geographical and archaeological contexts in west coast Scotland.

Following these preliminary seasons, a decision was taken to focus initially on Point of Sleat; this was because there was a known open-air Mesolithic site, relative sea level work had already been carried out and there was the potential to develop this and three shell middens were also located in the local area.

The first full field season took place in 2010; the Mesolithic site of Camas Daraich was reopened, the excavation was extended and preliminary test pits were opened at two of the shell midden sites. Both middens appear deep and test pits reached only the uppermost levels; radiocarbon dates taken from the uppermost 1m of the midden sites have produced dates ranging from 360BC – 1600AD and extensive bone and charcoal assemblages. Some artefactual material including a small amount of lithics, some pottery and a small copper alloy pin were also found (Hardy *et al.* 2010).

Excavation at the Mesolithic site of Camas Daraich revealed a large lithic assemblage, a small pumice and coarse stone assemblage including an unusual incised pebble, a small amount of charcoal and burnt hazelnut shell, a carbonised tuber and several concentric circles of stones.

Additionally, a topographic survey and geomorphological mapping integrating the paleolake, the raised shorelines and the archaeological sites was conducted.

2. Introduction *Karen Hardy*

The work described in this data structure report forms part of a long term project developed by the Catalan team, to develop new conceptual methods and a theoretical and methodological basis to explore social organisation of prehistoric hunter gatherer groups. For the last 20 years, the Catalan team (AGREST) has been conducting ethnoarcheological research into coastal hunter gatherers in Tierra del Fuego, most notably studying the archaeology and ethnography of the Yamana and the Selknam. Their work has comprised experimental ethnoarchaeology and excavation methods conducted on the prehistoric and ethnoarchaeological shell middens of Tierra del Fuego (Estévez, 2009; Estévez, Vila*, et al.* 2007*)*. Their ultimate aim has always been to apply their theoretical and methodological constructs to European hunter gatherer prehistory. The west coast of Scotland has many geographical and archaeological parallels with Tierra del Fuego together with a history of Mesolithic work to build on, and consequently this area was deemed most appropriate to develop this work.

The current project is based at Point of Sleat, as work already undertaken in the area (Hardy & Wickham Jones 2002, 2003, 2004, 2009, Selby 1997, Selby & Smith 2007, Wickham Jones & Hardy 2004) combines a known Mesolithic site, with sea level work and three known shell middens and forms a foundation on which to develop and expand (Hardy & Pique 2009a).

In a broader framework, the current project combines the theoretical focus with more regional concerns, and is currently exploring large-scale mobility, and in particular seasmanship and use of the sea and rivers as well as broader socio-economic perspectives. One of our aims is to try to understand the way Mesolithic people in Scotland moved around the land and sea, and explore perspectives of distance and mobility. The broad project is working in collaboration with members of CONICET in Ushuaia, Argentina and members of the University of British Columbia and is running a parallel ethnoarchaeological project in the Saloum Delta, Senegal with members of the Universite Cheikh anta Diop, Dakar where we are investigating the social and economic perspectives of island based shellfish collecting communities whose only means of transport are small wooden canoes.

Figure 1 Collecting shellfish, Saloum Delta.

Figure 2. A new shell midden, Falia, Saloum Delta.

Figure 3. Sea nomads, Tierra del Fuego

Figure 4. Canoes, NW Coast, Tierra del Fuego.

3. Survey 2008, 2009. *Karen Hardy, Raquel Pique*

Two two-week field seasons (October 2008 and April 2009) were undertaken to determine the potential for locating shell middens and Mesolithic sites on the mainland and islands of Skye and Raasay, Wester Ross, and to familiarise Catalan members of the team with the geography and archaeology of this area of western Scotland.

A combination of primary survey of previously un-surveyed areas, together with test pitting of sites that had been recorded but not tested (Hardy & Wickham Jones 2009) was undertaken (Hardy & Pique 2009a, 2009b).

3.1 Raasay.

Several shell middens in the mid east part of the east coast of Raasay at a location known as the Fairy Glen; this was first discovered by the SFS project but beyond noting their location, no further work was undertaken. In October 2008, a preliminary visit was undertaken as part of

this project. The aim was to assess the potential for test pitting and further work, and to explore the logistics of undertaking fieldwork in this remote area. During this visit, all previously recorded middens were located. In April 2009, the area was revisited for test pitting. This visit combined test pitting of known sites, with more intensive survey of the numerous rockshelters in the region. A consequence of this work was the discovery of numerous previously unrecorded shell middens (Appendix 2). Core samples were taken from many of these sites for analysis and radiocarbon dating. First radiocarbon results suggest that the shell middens are of mixed age, with Iron Age and Mediaeval dates occurring though many test pits did not reach bedrock (see below radiocarbon dating).

Figure 5. General view, Fairy Glen, Raasay.

Figure 6. Raasay Fairy Glen, site 6.

3.2 Point of Sleat.

In October 2008 a preliminary visit was made to the Point of Sleat. A Mesolithic site has already been partially excavated here (Wickham Jones & Hardy 2004). Though this site was not a shell midden, it lies close to the shore and a shell midden had been identified here in 2000 as part of the earlier work. No test pitting of this shell midden had been undertaken. Following a preliminary visit in October 2008 it was decided that the coastline around the Point of Sleat offered a high probability of containing further shell middens. As it had never been surveyed, it was considered a priority and was the subject of an intensive survey and coring programme in April 2009.

An area to the north and south of the Point of Sleat was surveyed in April 2009. As a result of this survey, two new shell middens in caves were identified; their location recorded and core samples taken for analysis and radiocarbon dating. A sample was also taken from the previously know shell midden and several possible underwater shell middens were noted. Some radiocarbon results are already available; these suggest that the sites are multiperiod (see below

radiocarbon dating). Though only the first one metre was sampled, dates went as far back as 360BC in Uamh an Dòbhrain.

3.3 An Corran.

The Mesolithic site of An Corran was the subject of a rescue excavation in 1993. Radiocarbon dates were taken and this together with the cultural artefacts confirmed it as dating to the 8th millennium BP. Several human burials were also found here and these were confirmed through radiocarbon dating as being of Neolithic age (Saville, Hardy et al forthcoming). The site was partially destroyed in 1993 as a result of road improvements. The site was scheduled by Historic Scotland and further work on this site is subject to approval by HS.

Two raw material sources (baked mudstone and chalcedonic silica), are also known in the vicinity of An Corran however no detailed work has been carried out here. A preliminary survey of the zone in October 2008, located a hitherto unrecorded small shell midden nearby. The midden was eroding out of the bank of a small river. When the team returned in April 2009 with the aim of undertaking a small test pit, the site had disappeared. The water level rises substantially here in the winter and the likelihood is that the site was washed away during the winter of 2008. The area around An Corran is of significant archaeological interest.

3.4 South of Uig.

The coastal strip to the south of Uig north of a large river at Earlish had been previously surveyed and substantial evidence of a Mesolithic presence had been identified here in the form of lithic material eroding out of the embankment. It was decided therefore to conduct more extensive survey work to the south of the river near Earlish and to take several core samples behind the coastal strip. In the event, no further evidence of Mesolithic occupation was encountered and it was decided that no further work will be undertaken here.

3.5 Glenelg.

The area of Glenelg in south east Skye is the nearest point to Skye on the mainland. A deep and fast flowing area of sea separates Skye from the mainland here. A local resident (Jimmy Watt) passed information to the project about the existence of several caves with shell middens in. These locations were visited with him, in his boat in May 2009. Four accessible caves containing shell middens were visited and some core samples taken for radiocarbon dating. Though several sites contain potentially deep shell middens, their access is difficult and in several it was not

possible to take appropriate samples. So far only one site has been radiocarbon dated (see below radiocarbon dates).

3.6 Green mounds

The island of Oronsay off Ullinish was visited as part of a survey of areas which had not been previously surveyed for shell middens. Several rockshelters were noted and the presence of numerous circular 'green mounds' were recorded. These mounds have a superficial similarity to the shell middens found in Tierra del Fuego, having a circular appearance with a concavity in the centre. Because of this similarity it was decided to conduct sample coring of these. In April 2009, the site was revisited and three mounds were sampled. None of these produced any evidence of being shell middens and it was decided that they were likely to represent structures related to 18th and 19th century shielings which were located nearby.

Martin Wildgoose informed us of further 'green mounds' that is lumps in the landscape that appeared artificial but which had never been explored archaeologically. Several of these were cored as part of this project, at Orbost, Sligahan and in Kylerhea. None of these produced any evidence of being shell middens and it was decided that no further work would be undertaken.

4. Camas Daraich Mesolithic site excavation, *Jordi Estevez, Manuela Perez, Assumpcio Vila.*

4.1 Digital registration system.

The excavation at Camas Daraich was carried out using a registration system that combines digital photography with the use of total station and orthorectification (Vila, 2004). This system permits excavation without using a metre grid which is an advantage when carrying out extensive excavation in an open space. It permits a genuinely broad perspective on the complete area under excavation, all the stratigraphic units present and their relationships, without artificial restrictions.

The excavation area chosen was based on the earlier excavation carried out in 2000 (Wickham-Jones & Hardy, 2004). This excavation was shorter than originally planned and our aim was to extend the excavation and define the extent and characteristics of the site (Figure 3).

Figure 7. Excavation area in 2000, lying perpendicular and crossing the newly made track (from Wickham-Jones and Hardy 2004).

A series of reference points were created using the total station to allow us to use this from any point on the perimeter of the excavation. The Azimuth (Figure 8: Az point) was located on one of the poles of the perimeter fence that marks the property. The 0 point (datum) was located on one of the reference points (Figure 8: Point R1). All points were marked with paint for future reference. Coordinates used with the TS were normally x = 50; y = 50 (Figure 8: E).

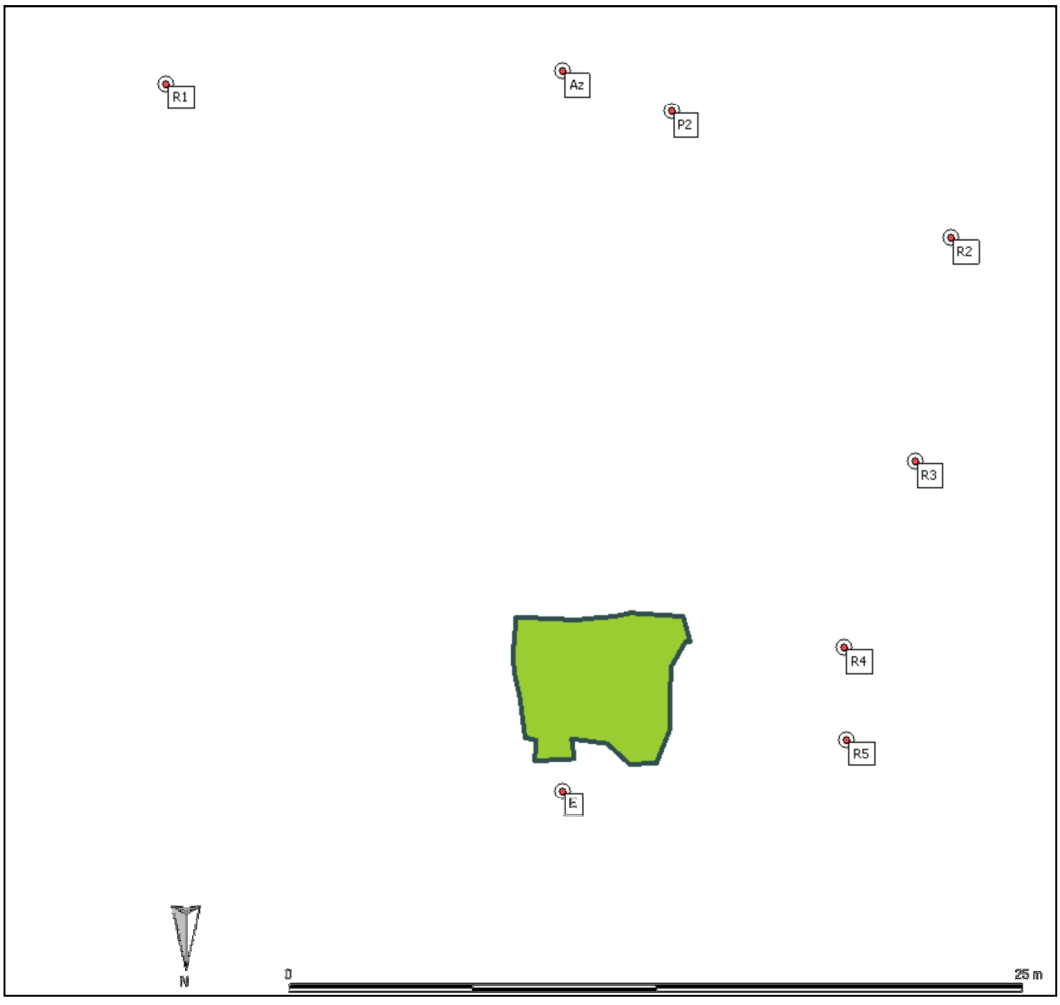

Figure 8. Reference points. Green area = excavated area

The rocks (Fig. 8: points R1 to R5) were positioned according to the axis we defined between the TS location and the azimuth (Figure 8: E and Az).

4.2 Photographic record.

The excavation was recorded using digital imagery. Each image was geographically oriented and located spatially by 4 nails in a square, which represented an abstract grid. Each image was positioned using the total station. All images were taken at a similar vertical distance with a 50 mm zoom. In this way an overhead view of the whole area under excavation was obtained.

A direction marker and a standard colour guide (Colour confidence Colour Guide separation BST14, 14 inches long = 35.5 cm) were placed at the edge of each image. This ensured the standardisation of the patchwork of colours in the images for each layer. All squares have an area of overlap to ensure a complete patchwork of the overall area, as well as each layer change.

Before excavation, an image of the area to be excavated was taken and placed on an A4 sheet which was then used as a recording sheet (Figure 10). When any context change occurred or a feature was noted this was imaged and matched with the original image as an auxiliary picture.

Each time a change of layer or context occurred or at any other appropriate time (eg the presence of structures, or prior to the removal of significant artefacts or material or when a set of large rocks has to be removed), a new image was taken and the reference points were repositioned with the total station. Thus each image represents a georeferenced excavated surface.

Each time a new image was taken, a new recording sheet was prepared to replace the previous one. All image numbers together with contextual links between them were recorded in sequence in a fieldbook. In this way, a three-dimensional picture using images and their super positioned relationships was constructed. This enabled a detailed representation of diachronic overlaps at the different times of occupation of the site.

Profiles were also imaged in section and were geo-referenced using a colour scale which was placed in the corner of each image. An initial suite of images was made for orthorectification. The stratigraphy was then analysed and coloured dots placed at the interface between different layers for identification purposes. New images were then taken with the coloured dots in place;

this enabled all the stratigraphic profiles to be checked after excavation with the initial suite of images.

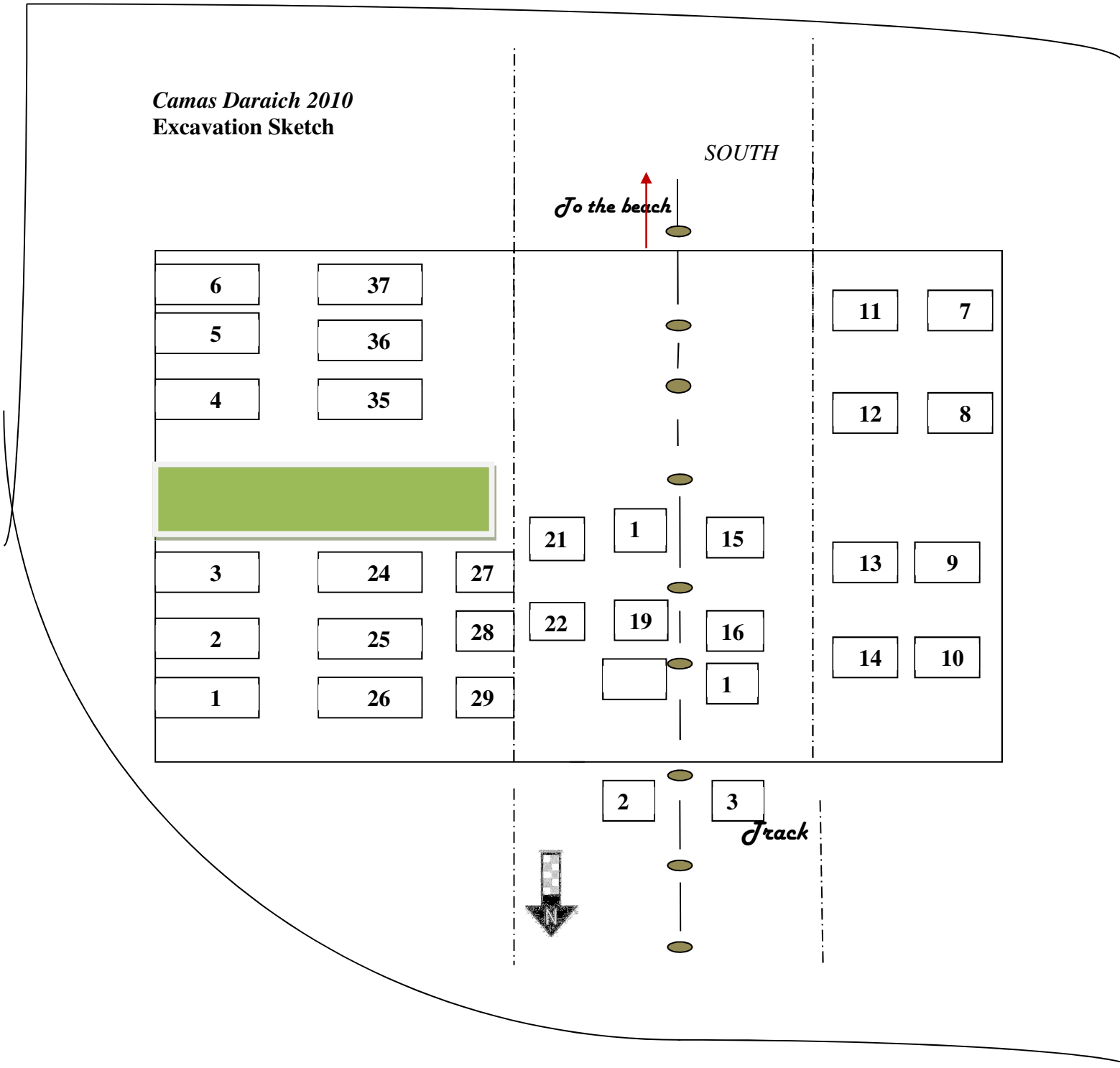

Figure 9. Schematic sketch correlating the images across the excavation area.

4.3 Total station surveying

One person managed the total station and recorded all images and coordinates in a fieldbook and a database. Coordinates included:

- the four corners of each picture (F points),
- Top and bottom (z) coordinates of all stones larger than 10cm (each coordinate received a number from the total station database and was recorded on the image and in a table on the excavation sheet.
- all topographic features (e.g. a depression or hump...)
- all stone artefacts larger than 1 cm^2 and other archaeological material (charcoal, burned bones...) recovered *in situ*. These are numbered in sequence from the start of the excavation (eg. 187, 253) and noted on the image taken and in the recording sheet. This means that the unique record includes the number of the artefact and the number of the image where it is found; for example artefact no. 350, image 129.
- the location of all laboratory samples (soil micromorphology (MM), chemical analysis (MQ-duplicate samples), phytoliths (MF)).
- Reference points of the stratigraphic sections (that is the four ortho-rectification reference points in each image and the coloured nails on the stratigraphic intersections).

4.4 Recording sheets (Figure 10).

Recording sheets are consecutive, numbered by image, and correlated with all connected recording sheets, both adjacent and above and below. The total station three dimensional (x,y,z) recording of all artefacts and features found in the image are also recorded on this sheet as well as the upper and lower z level of each stone or rock above 10cm in size as well as a description of these. As images are used in the field, rather than drawings, a more detailed and faster recording system can take place, in which every artefact found is also recorded visually. Equally all sieved material is therefore ascribed to a very specific horizontal and vertical space.

Likewise, all samples taken are recorded three dimensionally and numbered consecutively. Normal recording is also conducted including a written description of each excavated area or context, as well as soil texture, colour matrix, quantity, size and type of clastic fragments and quantity, type and distribution of archaeological material (Figure 10a, b).

4.5 Planimetric and stratigraphic correlation

Profiles were also imaged in section and were geo-referenced using a colour scale which was placed in the corner of each image. An initial suite of images was made for orthorectification. The stratigraphy was then analysed and coloured dots placed at the interface between different layers for identification purposes. New images were then taken with the coloured dots in place; this enabled all the stratigraphic profiles to be checked after excavation with the initial suite of images.

We then marked areas in each image that we had identified as significant during excavation after having noted and confirmed all associations (figure 14,15,16) and we compared these results to the on-site interpretations in the case of any concerns or unclearness in interpretation (figures 11,12,13). All the interfaces between contexts and layers were then plotted using a colour trace 31 pixels in diameter (Figures 11,12, 13). This was done using Photoshop and these were then superimposed onto the composite image. Where necessary, we enhanced colour to provide more contrast between contexts (Figure 13).

4.6 Results

The original 2000 excavation covered an area of 12m², lying across the track (trench 1), and seven 1x0.50m test pits to identify the limits of the site. The work focused on 4m² and was halted before the initially planned completion time. A large lithic assemblage was recovered, together with charcoal and several pices of pumice, and a hearth. The site was radiocarbon dated to 7985 ± 50BP and 7545 ± 55BP.

In 2010, we located the original trench, and opened an adjoining area extending to the west, east and south. The aim was to reopen the area around the hearth and on both sides of the track, to define the area affected by the drainage ditch as well as confirming the continued stratigraphic integrity. We also attempted, with only partial success, to locate all the original test pits and the full extent of the site.

PHOTO Nº: 124 FILE Nº:5183 DATE:23/05/2010 NAME: Jesus

X=48,625
Y=52,916
Z=-3,086

PHOTO Nº126

X=49,519
Y=52,961
Z=-3,090

PHOTO Nº

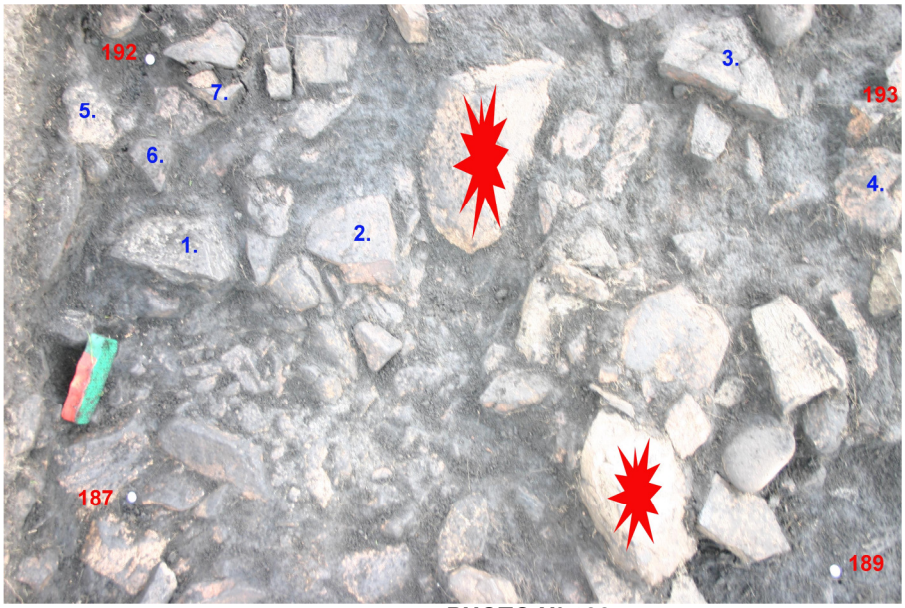

PHOTO Nº 125

X=48,676
Y=52,448
Z=-3,200

PHOTO Nº 122
N↓

X=49,492
Y=52,432
Z=-3,179

Previous photo: **Next photo:**

num	up	Z	down	Z	num	up	Z	down	Z	num	Up	Z	down	Z
1	273	-3,077	274	-3,109										
2	275	-3,102	276	-3,149										
3	277	-3,080	278	-3,104										
4	279	-3,090	280	-3,152										
5	281	-3,061	282	-3,086										
6	283	-3,094	284	-3,115										
7	285	-3,077	286	-3,112										

DESCRIPTION BEFORE EXCAVATION:

EXCAVATION: EARTH
TEXTURE:

- SANDY (X) CLAY ( )
- GREASY (X) ROOTS ( )
- GRAVEL ( ) MUDDY (X)
- OTHERS ( )

Figure 10a. Example of excavation recording sheet side a.

- **COLOR:**
- BLACK (X X)
- BROWN (x)
- YELLOW ( )
- OTHERS ( )

STONES

QUANTITY*:* lots ()()() moderate (x)- (x) few ()—()

TYPE: ()  (x)  () 

SIZE: ≤ 3cm ( ) > 3 cm (x) > 10 cm ( )

DISTRIBUTIÓN: Homogeneous (x) Concentrated ( )

RAW MATERIAL: Sandstone (x) Schist (dom)
Others (x)

SAMPLES:

F/phyto l( ) Lipids ( ) Q/chem ( ) Others ( )

ARCHAEOLOGICAL MATERIALS:

TYPE: lithics

RELATIVE AMOUNT: low, high

COORDENATES:

DISTRIBUTION: SE and S

GENERAL–ARCHAEOLOGICAL MATERIAL:.

AUXILIARIES PHOTOGRAPHS:

PHOTOGRAPH(S) Nº: no

DESCRIPTION:

OBSERVATIONS:

Different medium-sized angular stones are observed. These stones are between two large stones marked in the photograph and randomly dispersed.

Figure 10b. Example of excavation recording sheet, side b.

4.6.1 Stratigraphy and site formation

The stratigraphy of the site is not homogeneous and reveals differences on either side of the track, with variable facies also in a North-South direction. The original excavation area including the area affected by the track was reopened and cleaned. The track has disturbed and compressed the stratigraphy though it is difficult to determine the extent of this. Some traces of the black sediment that had contained most of the archaeological material, were still there but most of it had been removed, rapidly, at the end of the original excavation.

Eleven micromorphological samples (Kubiena tins) were taken in the profiles in order to confirm the stratigraphy and understand site formation processes; these analyses are still underway.
All layers slope northwards following the underlying topography. In the eastern part of the trench in the area not affected by the track, the stratigraphic profile reveals a difference between the north area and the south area (Figures 12, 13). The top layer is a grey compacted humus layer with no stones (Hum). Below this is another humus layer, also grey, but less compacted and containing many small-medium size stones (HWS). Below this and to the north is a very dark greasy layer containing abundant angular and rounded stones at its base (bM). This black soil (which was defined in the first season as level 10 "non organic midden") is steeply interrupted by a series of large rounded pebbles which are embedded in the layer below, a highly compacted yellowish sand (yellow encrusted sand) (yeS). To the south of this area, there was no dark layer identified, but immediately above the yellow sand, an almost imperceptible very thin layer of brown earth lay at the interface between HWS and yeS.

Artefacts appeared throughout the stratigraphy, although in the upper two layers lithics were mixed with some fragments of pottery and porcelain. At the top of the yellow sand some lithic artefacts with a whitish-yellow patina were found. Kubiena tin samples were taken at the interface between layers HwS, bM and yeS on the eastern profile section.

The west profile was more complex (Figures 12, 13), particularly towards the north due to some redeposition linked to the spoil heap of the old drainage trench.

The south part of this profile (Figure 12) is quite similar to the East profile and the layers Hum and HwS continue here. In the extreme south layer bM appears as a fairly thick layer interrupted and limited by some pebbles. Lying partially on this layer, is a yellow-gray sand (ygS) lying between HwS and the underlying compacted yellow sand layer (yeS). Below layer

yeS, loose orangey sand layer is evident in some places (oS).

In the north part of this profile, we took further micromorphological samples at the interface between bM and ygS. In the south part of the profile (Figure 12) the stratigraphy is more complex due to the old drainage ditch. It lies in a south-north south direction following the topography but at the extreme south end it is connected to another perpendicular old drainage trench falling down the slope from the west. The ditch is filled with large pebbles and stones and has no matrix fill. Below the surface humus layers (Hum, HwS) is a layer of yellowish sand mixed with small and medium stones (ySwS) which overlies the backfilled drainage ditch and is almost certainly comprised of the underlying soil that had been removed when the ditch was dug.

This trench cuts through a grayish layer containing small stones (gCwS) which overlies the greasy black layer (bM) and therefore can be interpreted as stratigraphically equivalent to ygS. The black earth (bM) is thickest in the northern part of the profile, but becomes thinner towards the south. At the thickest part it is very greasy and contains no stones in the upper part, but stones increase towards the base. Below this layer, the encrusted yellow sand appears (yeS) and beneath this, the orangey sand (oS). We took Kubiena box samples at the interfaces of bM and gCwS.

The paleobeach, which consists of a layer of medium sized rounded pebbles, was found in the test pits to the south but is not found in the main excavation área. Sedimentological studies will clarify if either the encrusted sand (yeS) or the orangey sand below (oS) corresponds to the raised paleobeach.

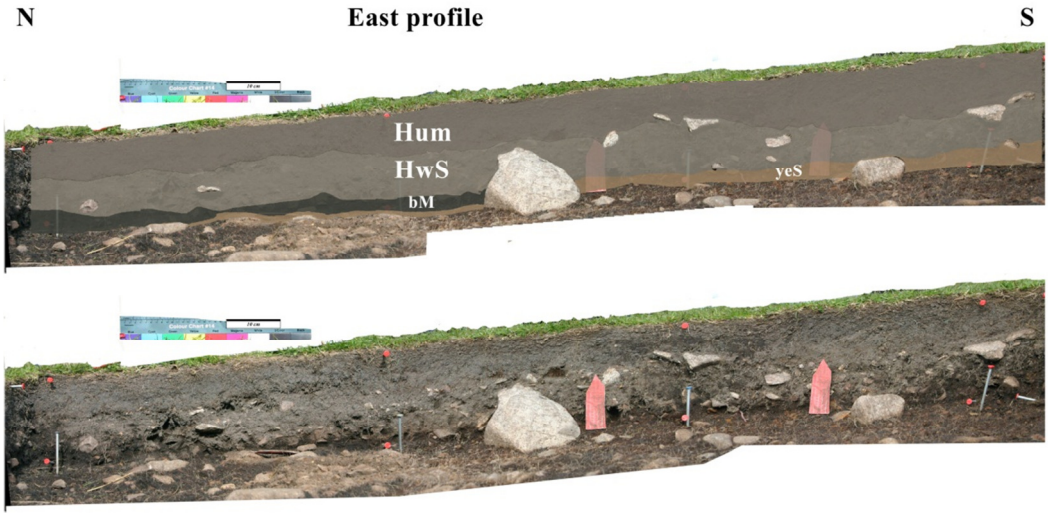

Figure 11. East profile. The colour scale is 35.5cm long.

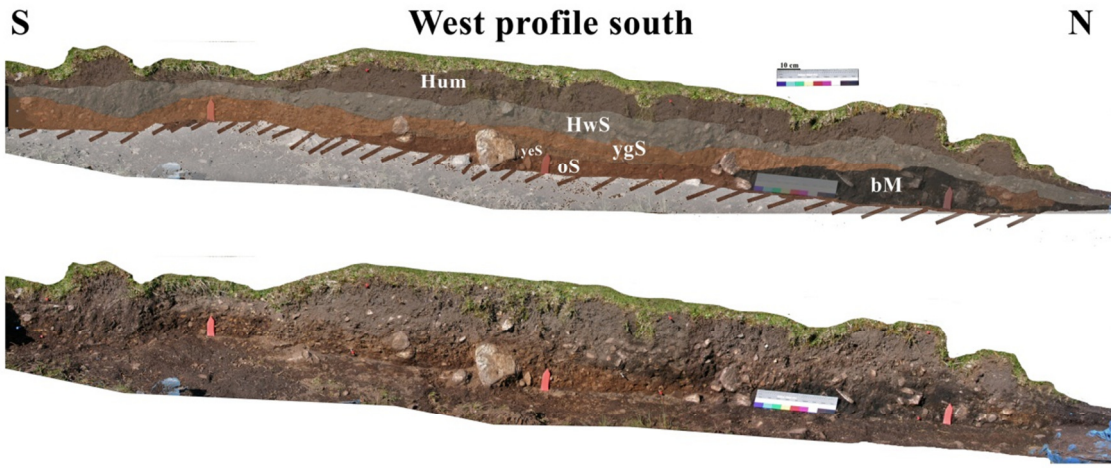

Figure 12. South part of the West profile.

West profile north.

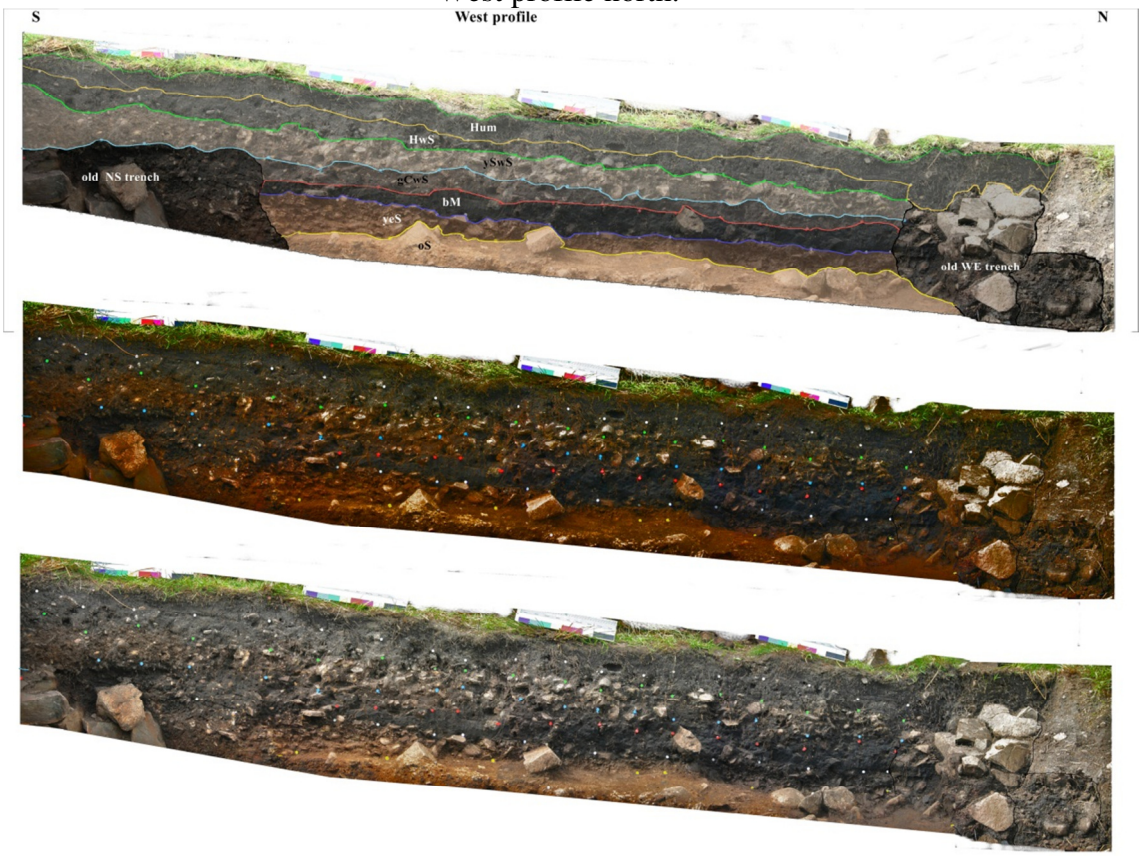

Figure 13. Northern segment of the West profile. A) Top: interpreted stratigraphy. B) Centre: increased and saturated colour. C) Bottom: actual view.

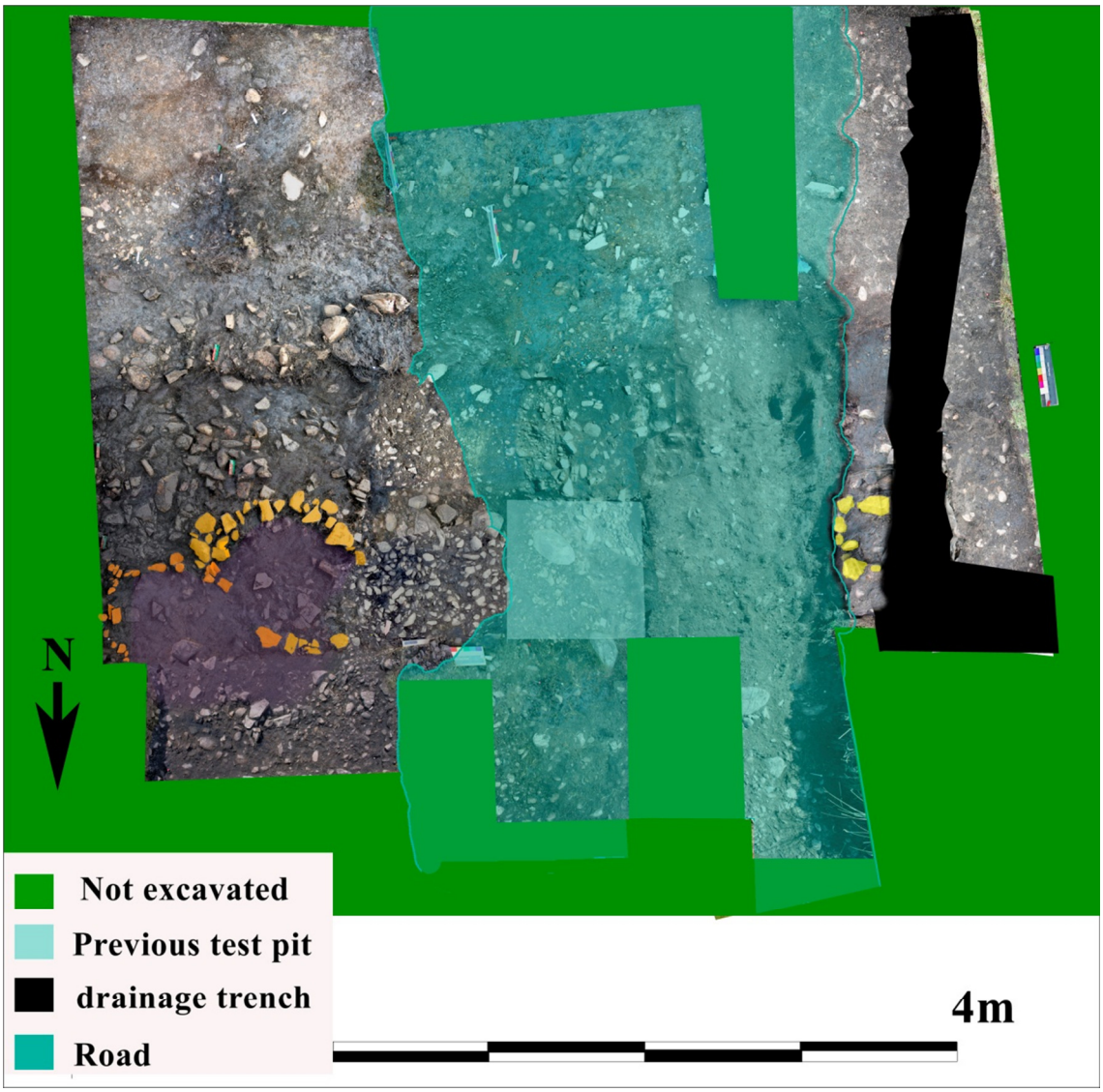

Figure 14. Top of layer bM. Marked in yellow are the elements that we consider to have significant association. Disturbed area (track) is marked in blue, unexcavated area is marked in green.

4.7 Summary of the East and West profiles.

East profile (1)

Hum- light grey humus without stones

HwS- humus rich sandy soil with moderate quantities of small angular-rounded stones and small rounded stones

bM- black matrix. Cultural layer. Few small angular stones and abundant medium size angular stones.

yeS- yellowish-orange encrusted sand with scarce medium size (3-7cm) rounded angular pebbles. Small rounded angular pebbles in moderate quantity. Few large, rounded pebbles.

West profile (south)
Hum- humus without stones (light grey)
HwS- humus rich sandy soil with moderate quantities of small angular-rounded stones and small rounded stones
ygS- yellowish grey sand. Little angular rounded pebbles
bM- black matrix . Cultural layer
yeS- yellowish encrusted sand (cultural level?)with little pebbles
oS – orange sand with small rounded pebbles

West profile (north)
Hum- humus without stones (light grey)
HwS- humus rich sandy soil with moderate quantities of small angular-rounded stones and small rounded stones
gCwS- grey yellowish clayey sand with stones. Small angular-rounded pebbles (stratigraphically equivalent to ygS)
bM- black matrix . Cultural layer
yeS- yellowish encrusted sand (cultural level?)with small pebbles
oS – orangey sand with small rounded pebbles

The micromorphological analysis will help to resolve a series of critical questions regarding site formation processes. These include 1) the formation process of the bM layer. This could be the result of formation in stagnant wáter and high humidity conditions or a result of a high organic input. This means it could be an original layer or could have come about as a result of water seepage from the drain. Our initial intepretations suggest it was formed by human activity and lies *in situ*.

The other key issue we need to clarify is the degree of disturbance or percolation of surface layers to establish whether there was any earlier agricultural activity (ploughing) that would have affected the upper layers. This could explain the large number of lithic artefacts found in the upper two layers, and the fact that, due to their nearness to the surface, it was not possible to separate the lithics from the ceramic fragments that also were found in the layers; they could either have been the result of artificial soil movement (e.g. agriculture) or natural percolation.

The micromorphology results will help us to confirm the existence of two occupation soil surfaces, one which lies in layers gCwS and ygS and the other, at the base of bM or the top of yeS. (Balbo *et al.* 2010, Vila *et al.* 2009). Because of the scarcity of artefacts in these layers, we were unable to confirm them with certainty.

4.8 Interfaces and posible significant associations.

Here we describe the three principal surfaces (levels) of the excavated area.

The first (Figure 14) corresponds to the surface of the black layer (bM). Here the bM matrix spans the northern half of the excavated area to where a small ridge marked by a line of stones occurs. To the south, the matrix consists of layers gCwS and ygS. In the NE corner there are two round circular stone alignments (highlighted in yellow) and a stone-free area (marked in purple in Figure 14). West of these circles is an accumulation of small-medium rounded pebbles. Charred macrobotanical remains were found in the northern part of this accumulation. In the NW corner of this plan, we have highlighted in yellow the stones at the base of the hearth excavated during the first campaign. We took a kubiena box sample here to confirm the microstratigraphic sequence of use of the hearth.

The second surface (Figure 15) corresponds to the base of layer bM. Here we noted a possible semicircular alignment of large stones with the base in layer yeS; this has resited the construction of the track above it and remains *in situ*. We have also identified a stone free area inside the semicircle. Between this possible alignment and the two previously mentioned there is an accumulation of small pebbles that form an alignment perpendicular to the ridge where layer bM disappears. This ridge is perfectly aligned with some pebbles that also define the extension towards the south of layer bM level in the west zone at the other side of the track.

The third surface (Figure 16, presented in gray scale here) corresponds to layer yeS. Stones are much less common, but a number of large stones lie firmly in this layer. These again form a series of circular spaces that are almost entirely free of stones. In the centre of the excavated area were two hollows with a subtriangular section and around 10cm in diameter and in deep. They were filled with soil from the overlying bM layer, which suggests they penetrated this level prior to the full accumulation of the upper bM matrix. Some lightly patinated or whitened artefacts were found on the surface of this layer, these were slightly larger than the artefacts found in the upper layers.

The superposition of these possible structures (Fig. 17) from layers bM and yeS does not completely coincide even though they are all similarly aligned NE. We therefore believe that they may represent different occupation periods, even though the largest of the lower (yeS) stones, are aligned with the others in the upper (bM) level.

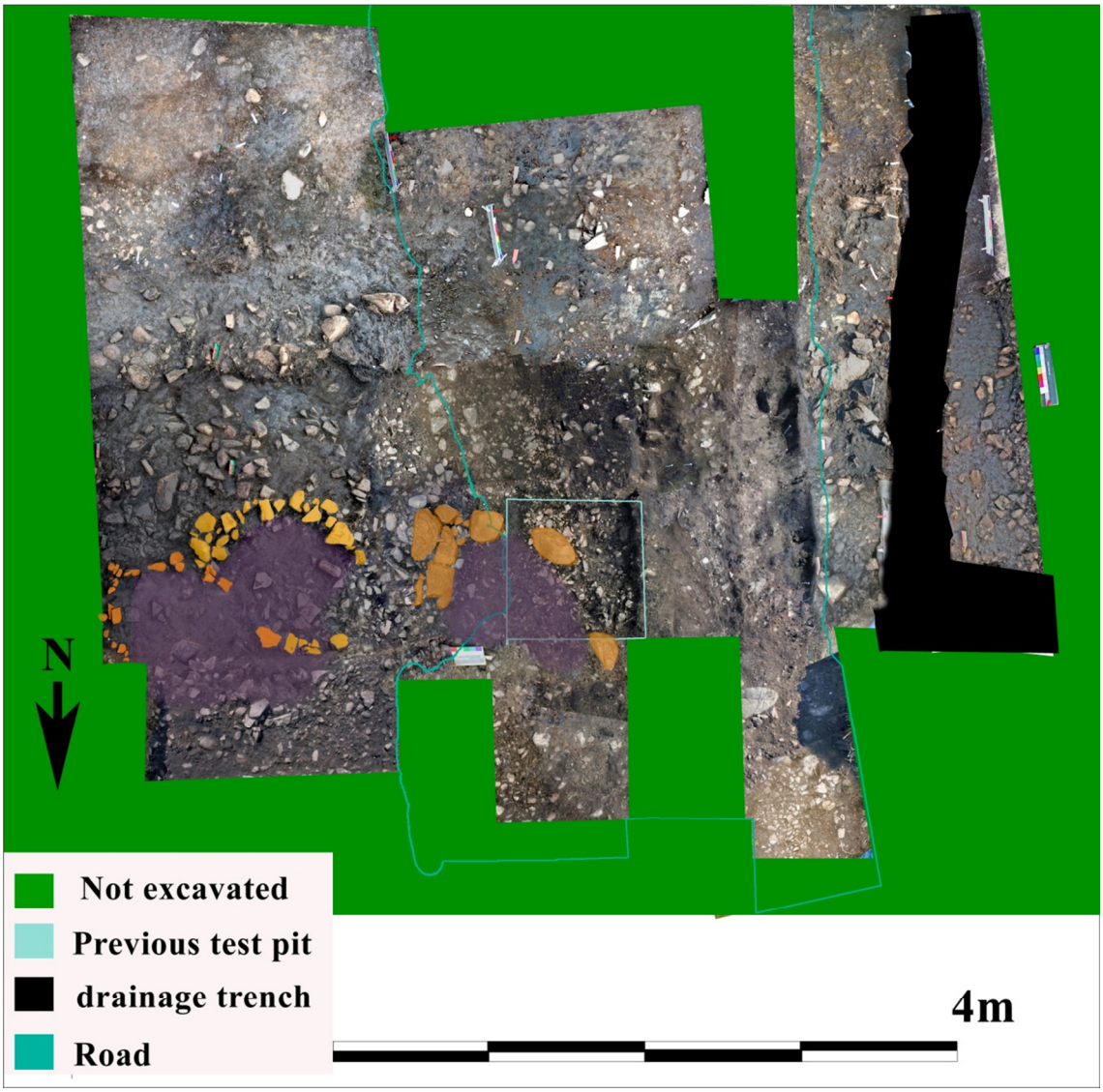

Figure 15. Bottom of bM layer. Yellow marks the areas of significant association. Blue marks the area disturbed by the track and green represents the unexcavated area. In this plan the hearth had already been removed.

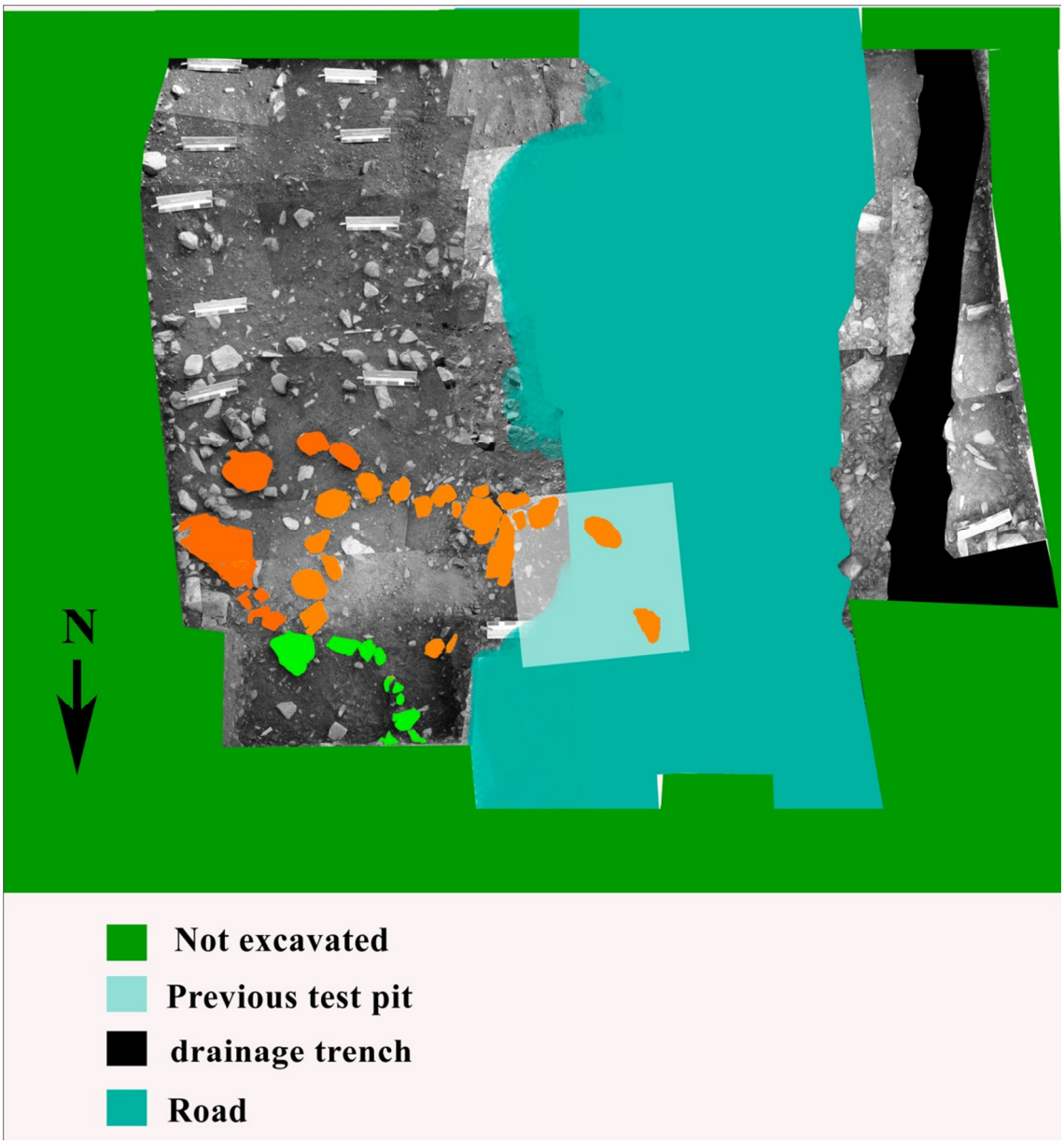

Figure 16. Surface of layer yeS. Orange and yellow mark the potentially significant stone alignments.

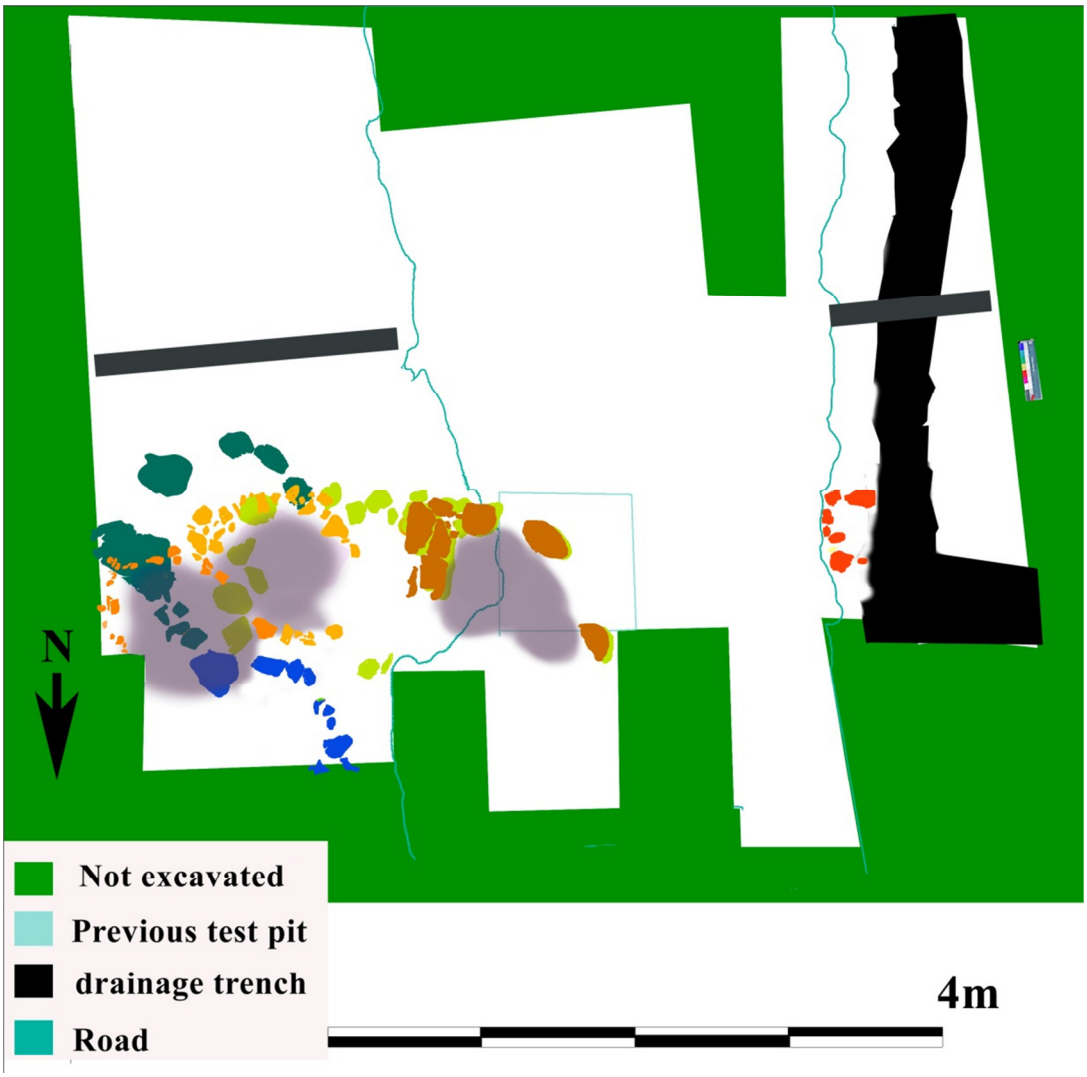

Figure 17. Superposition of all possible associated features and stones alignments. Blue is level yeS. Orange and yellow are level nivel bM. Brown and yellow cross from level bM to level yeS. In red, are the stones forming the hearth discovered in 2000. Violet marks relatively stone- free areas.

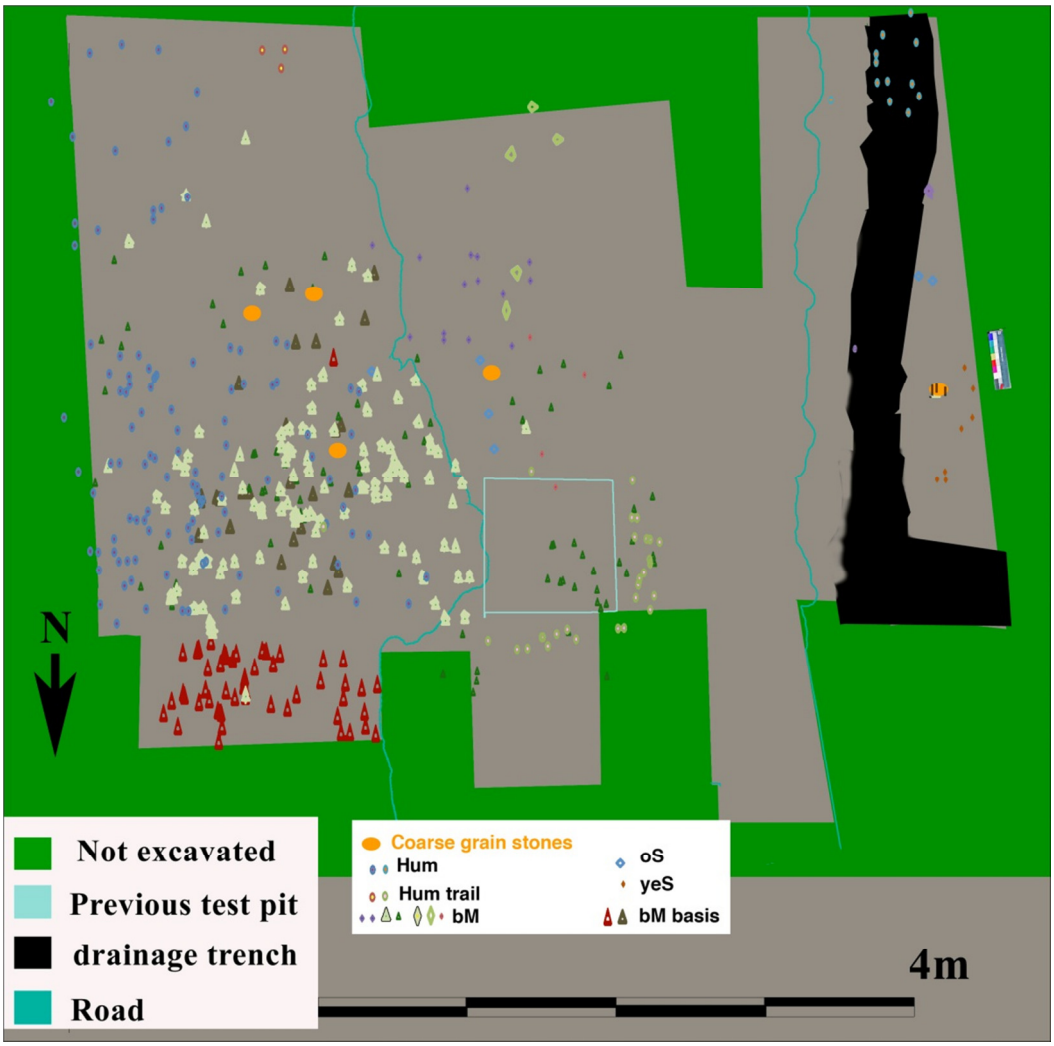

Figure 18. Distribution plan of all artefacts recored from all the stratigraphic levels.

4.9 Test pits

Two 1m² test pits were opened to the south of the main excavation to determine whether the occupation levels continued. The results were similar to the test pits taken during the first season in 2000. Immediately below the surface humus layers (Hum and HwS) which contained abundant lithics and some ceramic fragments, lay a thin brown clayey layer (brCS) that contained a small number of lithic artefacts. Immediately below this were the mixed sized beach pebbles. This paleobeach layer has a thickness of more than 50cm.

To determine the integrity of the layer underlying Hum, which could represent the same occupation layer as in the main excavation, a micromorphology sample was taken in both test pits, at the interface between Hum and brCs.

4.10 Samples taken.

The following samples were taken and are currently being analysed.

PHYTOLITHS	LIPIDS BARCELONA	LIPIDS YORK	MICROMORPHOLOGY	SEDIMENTS
21	20	19	13	5

In addition, samples were taken at each level and each image for laboratory flotation. The results so far have not retrieved any further macrobotanical remains.

4.11 Recovered artefactual material.

Many lithic artefacts were also tridimensionally recorded with the total station. (Figure 18). Most artefacts were concentrated in the NE part of the excavated area, in the same context as the stone alignments (Figures 16 and 17). Very few artefacts were found in the west (though it is important to remember that 2m² had already been excavated here in 2000). In the central area, affected by the track, our aim was to clean the dark areas, which could be the remains of the bM level; for this reason the distribution of artefacts may not be a true representation of all original material.

4.12 Significant finds.

A large lithic assemblage (section 5).

A small assemblage of charred material including one complete tuber (figure 19) The tuber which measured 3cm x 1.9cm was thin sectioned for SEM analysis. Unfortunately it is vitrified and has so far not been identified to species (fig 20).

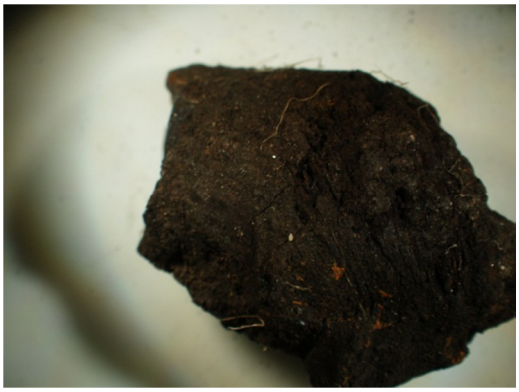

Figure 19 Tuber found in bM at the northern edge of the excavation area

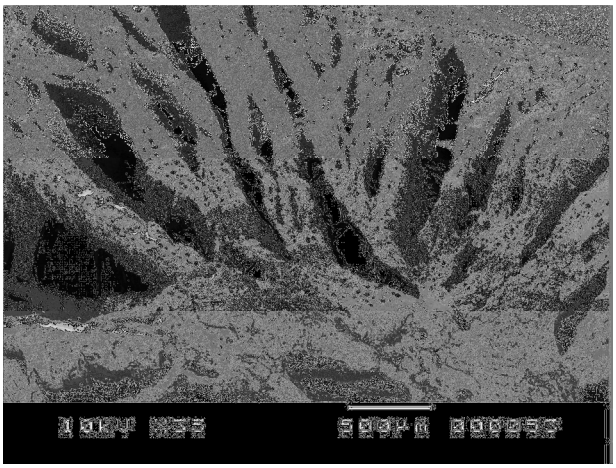

Figure 20 SEM image of internal structure of tuber.

Five pieces of pumice were identified (section 6). One piece has a light groove in it that may be the result of use for smoothing a thin, elongated artefact with a round diameter.

Figure 21. Groove in pumice piece.

Five potentially used coarse stones were identified; and are currently being analysed; 3 pieces (350, 351 and 358) were located in context bM and a one piece (463) was located in oS.

One pebble (Figs 22) with three parallel rows of incisions, together with numerous grooves of on both long edges, was recovered at the bottom of the bM layer in the west part of the excavation area.

A small number of glass and ceraminc fragments were collected from the upper level.

Figure 22. Two sides of incised pebble.

4. General Characteristics of Camas Daraich Lithic Assemblage

5.1 The lithics

The 2010 Camas Daraich assemblage consists of 3947 pieces that were recovered during controlled excavation, and also derived from sieving. Camas Daraich is characterized by a dense concentration of lithic artefacts as both campaigns 2000 and 2010 have demonstrated (Wickham-Jones & Hardy, 2004).

The 2010 assemblage includes 93 backed blades and partially backed blades, microliths, 1212 medium sized flakes, 69 small cores, scrapers, 2 possible fragments of barbed and tanged arrowhead (disturbed upper level), and a smaller numbers of burins, drills, abraded-end blades, all characteristic of Early Mesolithic industries. This typological sequence was found in a context that was radiocarbon dated to approximately 8000 BP (Wickham-Jones & Hardy 2004).

The cores are mostly simple platform cores with numerous bladelet scars. They appear to have been abdandoned once they were exhausted or in some cases when no further platform edge could be created.

Debitage dominates the collection although most pieces are secondary or tertiary flakes, rather than primary debitage. This is what would be expected of a site that is at some distance from the raw material sources; the material is likely to have been initially reduced at the source to reduce carrying weight. 55 pieces had cortex; mostly on some chalcedonic silica flakes. Patina is found on many baked mudstone pieces, these are sometimes highly patinated and altered, in which case the surface is white and has a chalky texture; in some cases where pieces have been recently

broken, it is possible to see the original dark grey stone. The only known sources for baked mudstone and chalcedonic silica are in Staffin, north Skye at a distance of around 65 miles by land (substantially further by sea). The high percentage particularly of secondary and tertiary debitage indicates that knapping has been taking place on site for the production of flakes, blades and a microlithic industry (identified by the presence of micro-burins and obliquely blunted blades).

5.2 Raw Material Catchment

The selection and utilization of one raw material over another significantly influences the different stages of the reduction sequence as well as the characteristics of the tool assemblage. Indeed access to suitable raw material is so essential that mobility patterns are highly influenced by the availability and the quality of raw materials (Andrefsky 1994, Wickham-Jones 2005); and the variable use of local and exotic raw materials can give indications about long distance interaction and exchange networks. The presence of exotic raw materials may be used to explore decision-making, selectivity and knowledge of the landscape (Gould *et al.* 1971).

At Camas Daraich an initial raw material analysis demonstrates a considerable range of types including baked mudstone, chalcedonic silica and its variables, Rùm bloodstone, quartz, quartzite, limestone and slate; this is similar to the original assemblage (Wickham-Jones and Hardy 2004). Chalcedonic silica is the dominant raw material across the whole assemblage. The siliceous material displays considerable variation in colour, inclusions and knapping quality. Currently the only chalcedonic silica source known about is at Staffin, though further work is required to examine the potential for other sources.

The source of Rùm bloodstone is on the west side of the island of Rùm, around 20 miles by boat (Wickham-Jones & Hardy 2004).

Quartz is the most abundant raw material in the immediate proximity of the site. It can be easily sourced within around 500m but it is not of a high quality for knapping. It is white and in some cases also has yellow tones. Limestone is ubiquitous and readily available though only very few knapped artefacts have been found. Quartzite outcrops at Ord, around 15km away by land or sea, in the north west part of the Sleat peninsula

A future Petrographic Analysis combined with systematic mapping of raw material outcrops will be conducted in order to provide us with more detailed information on raw material procurement strategies.

The study of the lithic assemblage from Camas Daraich concerns aspects of Mesolithic tool use and landscape in Isle of Skye and is the subject of our PhD project. We intend to focus on insights into human behaviour in the post glacial landscape by documenting artefact life histories (chaînes opératoires) and exploring decision-making by Mesolithic hunter-gatherers in region of Skye and nearby. We will focus particularly on why they chose particular lithic sources, and the information this provides on mobility strategies, tool manufacture, use and abandonment. Furthermore use-wear analysis will shed light and help us solve further behavioural questions (Clemente *et al.* 2008, Clemente & Gibaja 2009, Kamminga, 1982; Keeley and Toth, 1981; Moss, 1983).

5.3 Post Depositional Modifications

The analysis of lithic surface modifications identified three types of alteration; concretion, patination and thermal alteration. There is little evidence of concretion in Camas Daraich indicating absence of water movement. Concretion can be irregular or can appear as a thin white sheet covering the surface of the artefact. It is usually hard and compacted; this makes it difficult to remove without destroying the artefact.

Many artefacts at Camas Daraich have a weathered surface and a thin patina, either across part of the surface or across the entire artefact whilesome artefacts are so heavily patinated that much of the material has lost its physical characteristics. White patina is the most common, though other colours have been observed. Patina is absent from the quartz and quartzite assemblage; this is due to the characteristics of raw material.

Only a few artefacts (42 in total including 2 silicious artifacts from Uamh an Dòbhrain (Otter Cave) have evidence of thermal alteration. The most affected artefacts are again the siliceous ones and they have readily identifiable thermal fractures as well as colour change.

Thermal impact on quartzite is also readily identifiable as it exhibits the similar thermal patterns as siliceous material such as thermal fractures and colour change (although less characteristic than on siliceous material) but only very few quartzite artefacts were affected by thermal alteration

Camas Daraich 2010- Lithic Assemblage total : 3947

Lithic Assemblage General Structural Categories	Quantity
Flakes	1212
Blades	93
Cores	69
Fragments	1567
Chunks	700
Retouches Pieces	298
Pebbles	8
Total	3947

Raw material	Quantity
Chalcedonic silicas	1621
Bloodstone	1238
Quartz	966
Quartzite	12
Baked Mudstone	40
Not identified	87

Retouched pieces by Raw Material	Quantity
Mudstone	3
Quartz	14
Bloodstone	45
Chalcedonic silica	234
Not identified	2
Total	298

Cores by Raw Material	Quantity
Mudstone	3
Quartz	9
Bloodstone	16
Chalcedonic silica	41
Total	69

Flakes By Raw Material	Quantity
Baked Mudstone	57
Bloodstone	247
Quartz	97
Chalcedonic silica	811
Total	1212

Fragments by Raw Material	Quantity
Baked Mudstone	15
Bloodstone	360
Quartz	167
Chalcedonic silica	1025
Total	1567

Chunks by Raw Material	Quantity
Baked Mudstone	14
Bloodstone	119
Quartz	142
Chalcedonic silica	425
Total	700

Blades by Raw Material	Quantity
Baked Mudstone	4
Bloodstone	32
Quartz	2
Chalcedonic silica	53

Not identified	2

5. Preliminary Pumice Report (2011) from Camas Daraich

6.1 Introduction

Previous geochemical analyses from Camas Daraich (Newton, 2004) demonstrated that pumice from Icelandic eruption(s) were present at the site. Analyses were carried out on a dark brown piece of pumice, one of four found at the site. Three of these pieces were dark brown in colour and one grey piece found on the surface and so was undated. The three dark brown pieces were found in Trench 1, Context 8 (B3SW) and were radiocarbon dated from charred *Corylus avellana* seeds to 7670 ± 55 uncalibrated ^{14}C years BP (calibrated 2 sigma ranges are 6638-6424 BC). One of the pieces was geochemically analysed using an electron microprobe to establish its major element geochemistry. These analyses enabled the pumice to be geochemically correlated to pumice found at the Mesolithic archaeological site at Staosnaig on Colonsay (Newton, 2001) and the Vikurhóll deposit on the southern flanks of Katla, southern Iceland (Newton, 1999). The geochemistry of all these deposits is similar to the ~12000 cal. BP Vedde Ash, which was produced by a large eruption of Katla.

6.2 2011 Analyses

Fresh samples from excavations in 2010 show that pumice is quite common at the site. Two types of pumice were found. The first is a light brown pumice, which is morphologically similar to the deposits found at Vikurhóll and Staosnaig. One of the pieces from the bag labelled 78 was sampled. A darker, almost black pumice is also found and a piece from sample 342 was selected for analysis. This piece was morphologically similar to the black pumice from Staosnaig.

The pumice was analysed on a Cameca SX100 microprobe, which is different to the instrument used for the other analyses. Whilst the accuracy of the analyses is not affected, the precision is and there was noticeably less spread of TiO_2 abundances for example. This however, does not affect the interpretation of the results. Table 1 and Figure 23 show the results of these analyses.

6.3 Results and Conclusions

Table 1 and Figure 23 show that the brown and black pumice from Camas Daraich has the same geochemical characteristics as the black and brown pumice from Staosnaig. As discussed above, the brown pumice at Camas Daraich and Staonaig can be geochemically correlated to the Vikurhóll pumice found on the flanks of Katla and the Vedde tephra (Newton, 2001). CD 342

can be correlated to this group. The black pumice CD 78 can be geochemically correlated to the black pumice at Staosnaig which was in turn linked to two tephra layers found close to Katla, A11 and A12, which are younger than A13 tephra which is dated to 7505±42 ^{14}C years BP (~8300 cal BP), but older than the circa 7500 cal BP Holmá Fires eruption (Larsen et al., 2001).

To summarise, all of the pumice found at Camas Daraich can be geochemically correlated to the pumice found at Staosnaig, Colonsay. The brown pumice was erupted from Katla and is geochemically correlated to the ~12000 cal BP Vedde eruption (although it is not clear if there was more than one eruption which produced the pumice). The black pumice at Camas Daraich is geochemically linked to the Katla A11 and A12 tephra layers which were probably erupted around 8000 cal. years BP.

CD 342	SiO_2	TiO_2	Al_2O_3	FeO	MnO	MgO	CaO	Na_2O	K_2O	P_2O_5	Total
	70.20	0.87	14.04	3.91	0.16	0.71	2.09	5.10	3.28	0.15	100.53
	69.81	0.85	13.80	3.97	0.16	0.77	2.06	5.15	3.20	0.15	99.92
	69.65	0.86	13.85	3.82	0.14	0.69	1.90	5.18	3.29	0.14	99.51
	69.59	0.87	13.59	3.97	0.15	0.66	1.94	5.12	3.27	0.14	99.30
	69.16	0.86	14.28	4.75	0.17	0.75	2.14	5.19	3.25	0.14	100.67
	69.11	0.86	13.90	3.91	0.15	0.68	2.05	5.15	3.28	0.16	99.25
	69.04	0.86	13.66	4.24	0.17	0.76	2.20	4.94	3.20	0.15	99.21
	69.02	0.87	14.30	4.17	0.17	0.69	2.05	5.03	3.20	0.15	99.65
	68.77	0.87	13.52	4.35	0.17	0.74	2.11	5.11	3.16	0.15	98.96
	68.60	0.87	13.74	4.50	0.16	0.77	2.10	5.14	3.23	0.13	99.24
	68.59	0.87	13.73	3.98	0.16	0.73	2.11	4.99	3.30	0.15	98.62
	68.54	0.86	13.97	4.20	0.16	0.72	2.08	5.17	3.28	0.17	99.15
mean	69.17	0.86	13.86	4.15	0.16	0.72	2.07	5.11	3.24	0.15	99.50
stdev	0.53	0.01	0.25	0.28	0.01	0.04	0.08	0.08	0.05	0.01	0.61

CD 78	SiO_2	TiO_2	Al_2O_3	FeO	MnO	MgO	CaO	Na_2O	K_2O	P_2O_5	Total
	72.05	0.29	13.06	3.62	0.15	0.21	1.31	5.30	3.60	0.04	99.61
	71.98	0.28	13.43	3.94	0.14	0.19	1.47	5.12	3.65	0.04	100.24
	71.76	0.28	12.91	3.71	0.16	0.20	1.34	5.03	3.52	0.04	98.96
	71.75	0.29	13.34	3.85	0.15	0.20	1.34	5.10	3.58	0.04	99.64
	71.72	0.28	13.09	3.93	0.15	0.21	1.37	5.12	3.68	0.03	99.59
	71.66	0.29	13.01	3.83	0.15	0.17	1.30	5.15	3.54	0.03	99.13
	71.46	0.28	13.49	3.84	0.15	0.20	1.32	5.44	3.73	0.04	99.95
	71.35	0.29	13.14	3.87	0.16	0.24	1.38	5.42	3.57	0.04	99.46
	71.17	0.28	13.55	3.68	0.15	0.20	1.35	5.42	3.54	0.04	99.39

	71.10	0.29	13.32	3.75	0.14	0.17	1.37	5.05	3.59	0.04	98.82
	70.96	0.29	13.41	3.92	0.16	0.23	1.48	5.24	3.55	0.04	99.27
	70.90	0.28	13.11	3.88	0.16	0.21	1.44	5.22	3.58	0.04	98.83
	70.61	0.28	13.25	3.82	0.15	0.20	1.37	5.13	3.58	0.04	98.42
mean	71.42	0.28	13.24	3.82	0.15	0.20	1.37	5.21	3.59	0.04	99.33
stdev	0.45	0.00	0.20	0.10	0.01	0.02	0.06	0.14	0.06	0.00	0.50

Table 1: This table shows the major element composition of the two analysed pumice pieces. Total iron is expressed as FeO and the analyses are sorted in descending SiO_2 abundances.

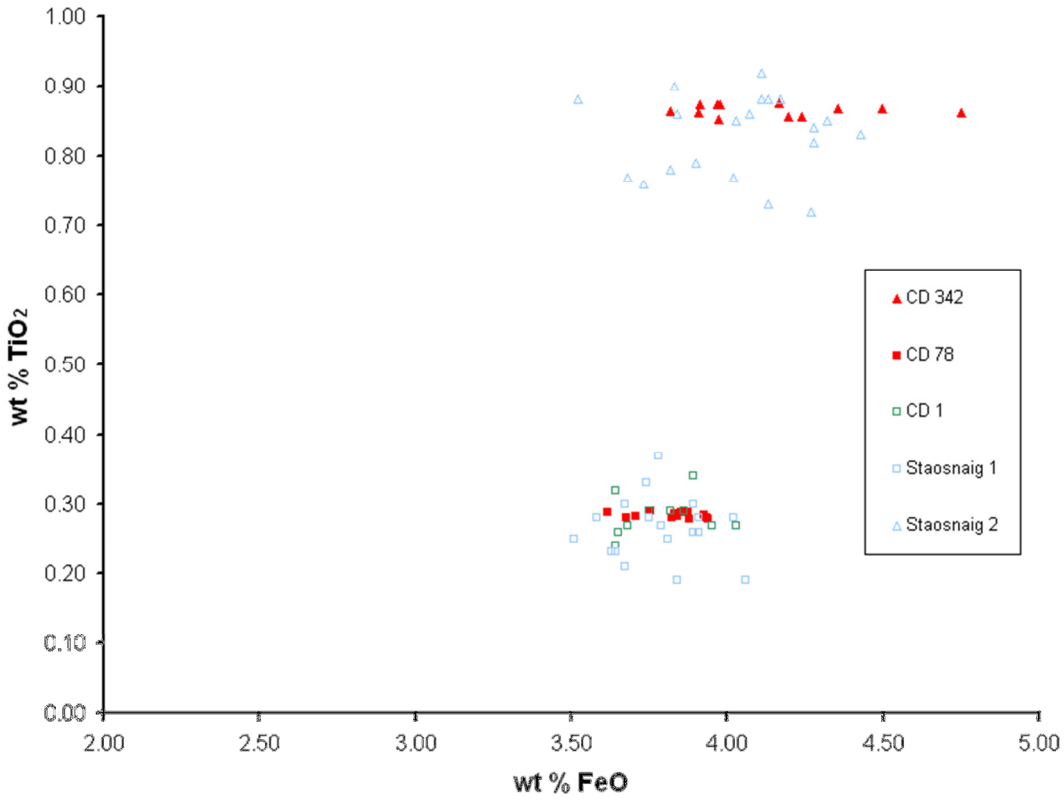

Figure 23. CD 342 can be correlated with the black Staosnaig pumice and CD 78 with the previously analysed Camas Daraich pumice and the brown Staosnaig pumice.

6. Camas Beach (CB) rockshelter shell midden. NM 5672 9997

David Jackson, Jordi Estevez

7.1 Introduction

The following report aims to describe the course of the excavation of the shell midden and the findings and interpretations which were immediately apparent, as it is based almost entirely on

field notes; detailed analyses of the environmental and artefactual material remain to be completed.

7.2 Situation

The midden itself is neatly contained within an open-air rock shelter/cave site approximately 60m north of the picturesque beach at Camas Daraich (Bay of Oaks), and is approximately 170m to the south of the main excavation site (NG 5672 0000). The rock shelter (Fig. 24) provides outstanding protection from the elements, as well as a commanding view (Fig. 25) of the bay to the south. There is also a series of raised beaches immediately to the east. In the nearby area, specifically the headland to the west of Camas Daraich, there are at least two other known cave sites with associated midden deposits.

The geological fabric of the rock shelter and surrounding area appears to be a dark schist with a sometimes bluish, sometimes pinkish tinge. The shelter/cave itself seems to have formed from a 'buckling' of the rock layers under compressive stress. The area enclosed by it is, today, congested with a considerable amount of rocks, including some large boulders, the midden material, and some overgrowth. It is perhaps reasonable to suggest that some of the stone debris could represent the remains of a greater ceiling or overhang that once existed in antiquity and that the enclosed area was significantly more spacious prior to the accumulation of deposits there.

7.3 Method

A 1x2m area was selected for the insertion of the trench. This incorporated the highest point of the shell midden deposits at its northern end, and a relatively clear and accessible area sloping away to the south. The trench was divided into two 1m² areas, simply labelled A and B. These areas were then further subdivided into four 0.50m² squares each, and labelled according to orientation (e.g. A-NW, A-SE, B-NW). The long axis of the trench was approximately aligned NNW. The position of the trench was recorded in 3-D using a total-station as part of the topographical survey; however, we did not have access to it for the duration of the excavation, consequently recording during the excavation was conducted manually.

After a series of pre-excavation photographs were taken, surface debris, grass-sod and loose material were removed, and the underlying surface was then photographed. The following layers of loose humic soil were each systematically photographed, sampled and removed one by one. These layers (001-007) were practically homogenous, but varied ever so slightly in compaction, a

fact that was only really discernable at the trowel's edge. Where possible, two soil samples were extracted from each of these layers; one from each of the central areas of squares A and B.

The excavation and sampling strategies were revised for the subsequent layers (CB5-CB75), as they had a vastly differing composition to those above. These deposits were instead composed mostly of shell, and so the soft brush became the primary excavating tool. From these 'true midden' layers it was possible to identify several separate contexts and establish their relationships. Where possible, two samples were taken from each of these contexts, one 1.50L bag, and one 0.75L bag. The remainder of each context was sieved, and the overall volume of each context was estimated.

While approaching the lowest levels reached during this excavation, a considerable amount of supposed rock-fall debris was encountered in the trench. This material was carefully photographed and documented. The more substantial rocks were attributed serial numbers and the levels of their highest and lowest points were also recorded.

On the final day of excavation a series of detailed post-excavation photographs were taken of the four section profiles and of the base surface. A grid-point system was employed so as the profiles and base could be accurately correlated at a later date.

Prior to backfilling the trench, an attempt was made to retrieve a sample from as deep a point as possible using an auger, in the area B-SE. However, the composition of the midden deposits and the sheer amount of stones below the surface made this attempt generally unsuccessful. The auguring disrupted a much larger area than was expected. Despite this, the disrupted material was removed and a secure sample was taken from the base of the hole, which then measured 0,4m N-S, 0,5m E-W, and was 0,15m deep.

The base and sides of the trench were then covered with a perforated plastic sheet and the trench was backfilled with the stones and spoil from the excavation. Finally, the original grass-sods were replaced and the site was vacated.

7.4 Stratigraphy

Layers 001-007

Generally these layers were a loose, dark, sandy or humic silt, 1-10cm thick, and containing high quantities of whole and crushed shells (mainly limpet and periwinkle), and some of the usual

inclusions such as small stones. In layers 003, 004 and 005 some larger stones, possibly representing a minor rock-fall episode, began to appear. Some small animal bones were recovered from 003, from the areas A-SW and B-NW. There was also heavy root activity throughout layers 001-007.

Layers CB5-CB75

The layers CB5-CB35 were essentially composed of whole and fractured shell with a loose brown sandy silt matrix. It was estimated that the shells accounted for at least 80% of the composition, with the remaining 15-19% being the soil matrix, and 1-5% inclusions such as small angular stones and occasional bones or bone fragments. These contexts were relatively small limited deposits and sometimes discernible from each other by thin streaks of organic material, which were interpreted as the remains of decayed root systems. Another defining characteristic of these contexts was an outer layer of fractured shell covering the intact shells beneath. Identifying such 'trampled' layers is a useful technique for distinguishing contexts that would otherwise be quite indistinguishable.

The following layers CB40-CB65 represented a refreshing change from the previous layers in that they contained considerable amounts of artefactual material and some other indicators of past human activity, apart from the deposition of midden material, on the site.

CB40, a dark greyish-black sandy silt deposit, containing only moderate amounts of shell, seemed to be delimited by a quantity of medium-to-large stones in the northeast corner of the trench, area A-NE. Notably; CB40 also contained several reasonably large fragments of what appeared to be late prehistoric ceramics, fragments of well-preserved animal bone, and charcoal. The ceramics were coarse and blackened and are tentatively described as 'kitchen ware'. For such a diminutive contextual unit, at approximately 0,20m N-S, 0,15m E-W, and 0,07m deep, it produced a substantial amount of interesting material, which ought to yield a good deal of information about the use of the site.

The layers CB45 through CB65 represent a return to the shell-rich soil deposits similar to those seen in previous levels. They were composed of high quantities of shell, but with a dark greyish-black sandy silt matrix, similar to the composition of CB40, and they also contained further amounts of ceramic fragments, bone (some burnt), and charcoal. These deposits however were much more substantial than any of those that had previously been encountered. Interestingly,

CB65 produced a small, corroded metal object, but this appeared to be quite young in age and may well turn out to be intrusive.

CB70 and CB75 were similar in composition to layers CB45-CB65, but with a lower shell content and contained a considerable amount of rock-fall debris throughout. The stones were generally angular and many of them were quite large in size, often with maximum dimensions in excess of 0,40m. The debris was carefully recorded and subsequently removed along with the remains of CB70 and CB75.

Below CB70 and CB75 was a new level of extremely shell-rich deposits seemingly similar to contexts CB5-CB35. The surface was cleaned and photographed but no further excavation was carried out.

7.5 Interpretations

Although there was a total of 22 individual contexts identified and excavated from the shell midden at Camas Daraich, it is possible to group them into 3 main levels.

Level 1 consists of the uppermost soil-rich level.
Level 2 consists of the shell-rich 'true midden' deposits.
Level 3 is a soil-rich level.

The rock-fall debris is generally restricted to the two soil-rich levels, these levels represent periods of the general disuse of the site.

The shell-rich deposits, apart from showing that midden material was deposited at the site, also seem to signify that other activities may have taken place there. The ceramic fragments, charcoal, and bones, some of which were burnt, could be interpreted as an indication that food was perhaps cooked and consumed at or near the shell midden. More detailed interpretation needs to wait until completion of the environmental and artefactual reports. A small number of pottery finds are currently being examined in the NMS.

Fig. 24: The rock shelter containing the shell midden at Camas Daraich, from south.

Fig. 25: View of Camas Daraich to the south, from the rock shelter.

7. Test pitting of Uamh an Dòbhrain

André Carlo Colonese

8.1 Introduction

Uamh an Dòbhrain (Otter Cave) (NM 5609 9977) is located to the south west of Camas Daraich. It is a south facing cave in an extreme coastal situation which lies approximately 10 m above the high water mark, and can only be accessed at low water.

The cave consists of two caverns, the outer cavern is approx. 20 m² and the inner cavern is approx. 15 m². Rockfall is mainly concentrated at the entrance of the cave. The surface level contained some sea shell, animal dung and some bones. From the entrance of the cave two distinct surface deposits were visible:

1) A blackish, compact, slightly clayey, silt and sand deposit with abundant sea shells. This deposit was restricted the entrance of the cave and most of the outer cavern.

2) A yellowish brown silt and sandy deposit; this deposit is limited to the inner limit of the first cavern and covers the entire inner cavern.

8.2 Method

A lack of appropriate artificial light meant that the test pit had to be opened near the entrance, though even here, the light was deemed to be inadequate and work stopped after 80cm. The test pit (*0.50m x 1m*) was oriented EW to the west side of the cave entrance, in the outer cavern at approx. 5 m from the roof fall located at the cave mouth. The material from the eastern part of the test pit (*0.50 x 0.50m)* was sieved with a 2mm mesh, and the residual deposit was deposited at about 5 m from the cave entrance, next to the rock wall which bordered the cave and the approach to it on the east side.

8.3 Results

Stratigraphic sequence

Layer A (Clean): surface, not sieved, approximately 4cm deep.

Layer B: yellowish-brown sandy-silt layer. The surface of layer B contained the remains of various sea shells and bones of small animals, and was divided into layers B1 and B2 based on the discovery of some stones that signaled the basis of the second paleo surface.

B1 and B2 were inconsistent, B1 was disturbed in the western part of the excavated area (towards the wall of the cave). These layers contained a number of shells of marine molluscs, some bones and no lithic or ceramic material. At the base of level B2 we decided to limit the sieving to material from the eastern square.

Layer C: lay below B2. This is a layer of silt and sand with some black clay, with substantial amounts of charcoal and marine shells (mainly *Patella sp.* and *Littorina sp.),* and a small amount of bone. Layer C tilted downwards toward the east and lay between -9 and -19 cm. This layer contained land snails and some bones of mammals and fish. The C layer is divided into three levels (C1, C2 and C3) due to the presence of deposits of ca. 2-3 cm of sediment silt-sandy with no faunal material, separating the deposits of shells. The C layer may be the surface deposit that appears at the entrance of the cave and tilts downwards towards the interior of the cave where it is covered by the yellowish-brown layer (B).

Level C1: because of its thickness (from approx. Cm -9 and -16 to -25 and -27 cm) C1 was split

into three units (1st, 2nd and 3rd). The number of marine mollusc shells increases as the layers descend. Bone fragments found at the base of this layer lay horizontally. Unit C1 contained one piece of struck flint, a sherd of unglazed ceramic material, and a small bronze artefact (small hook-shaped, 1.5 cm). The horizontal arrangement of bone remains, the presence of a layer a few cm thick lying between level C1 and C2 and the various pieces of archaeological material suggests that level C1 is *in situ.*

Level C2 is similar to C1 and is divided by a greyish, stony sandy-silt layer approx. 2 cm deep.

Level C3: was divided into two units due to the thickness of the deposit. Unit C3.1 contains abundant marine molluscs and seems to have a greater amount of Littorina sp. than previous levels. At the base of the shells is a horizontal layer of stones ca. 2 cm thick with no archaeological materials. Unit C3.2 lay just below the stones. This unit contains some shells and large animal bones (>10 cm), along with some stones in the bottom of the deposit (at ca. 30cm).

The excavation then stopped due to lack of light. The test pit was covered with terram, backfilled and covered with large stones for easy identification.

A small number of pottery finds are currently being examined in the NMS. One copper alloy hook or clasp was found.

8. Preliminary bone report. Uamh an Dòbhrain (Otter Cave) and Camas Beach Cave.

Jordi Estevez

9.1 Camas Beach Cave

Animal bones were recovered from 15 stratigraphic units.
The weight of the bones varies according to unit, with two peaks, in units 50 and 70.

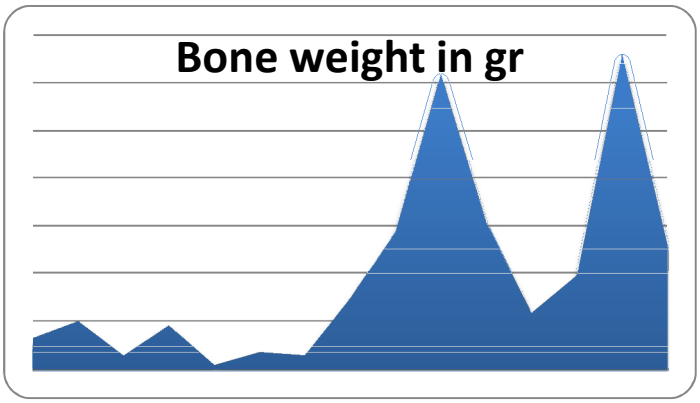

Figure 26. Bone weights in gr per unit.

The bones are extremely fragmented. We split the bones into five size categories with the aim of understanding the nature of this fragmentation. The following is the classification according to maximum length.

A< 1cm

B<2 cm

C<3 cm

D<5 cm

E>5 cm

Most bones are in the smallest category, A. (<1cm).

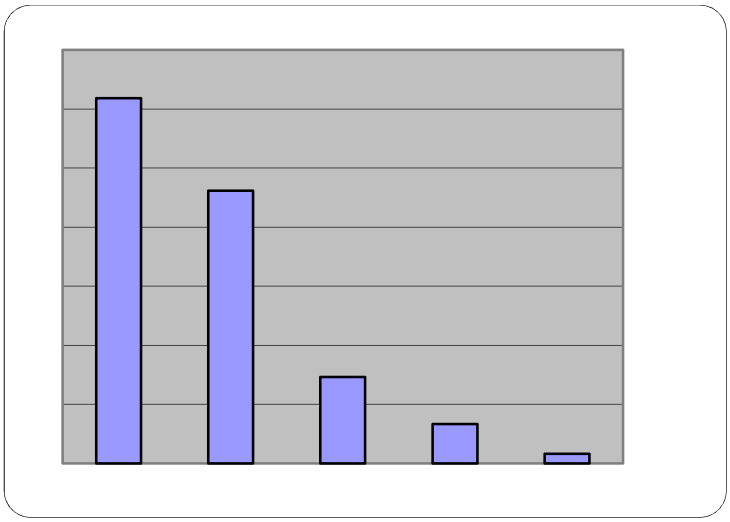
Figure 27. Number of bone remains by size.

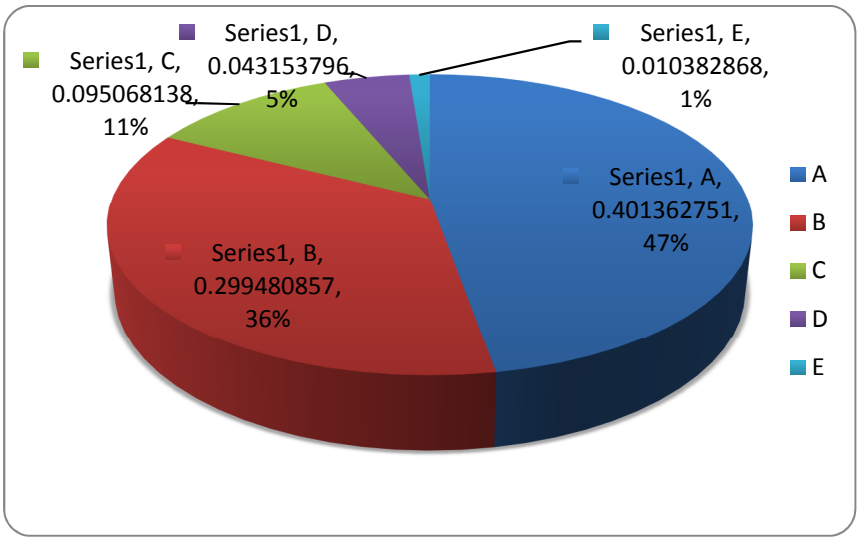

Figure 28. Percentage of bone remains according to size.

These percentages are not consistent through the units, in units 35, 55, 65, 70 y 75 slightly larger bones occur in greater quantity (category B).

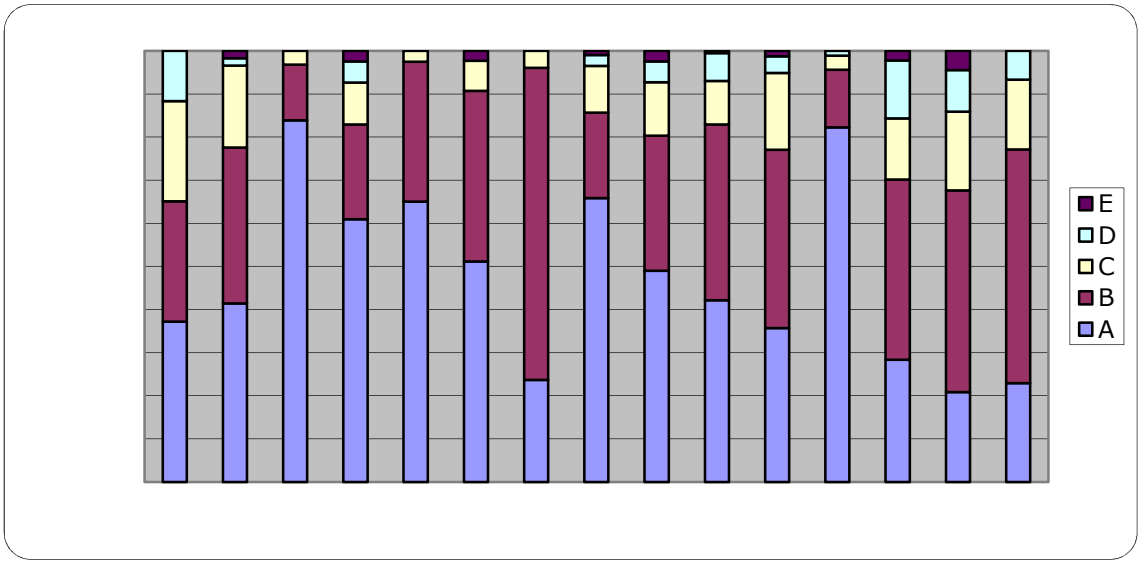

Figure 29. Size categories according to stratigraphic unit

There appears to be no pattern to the nature of the fragmentation, for example bone size does not increase in the deeper units. There is no correlation either in the quantity of bones per unit and their fragmentation.

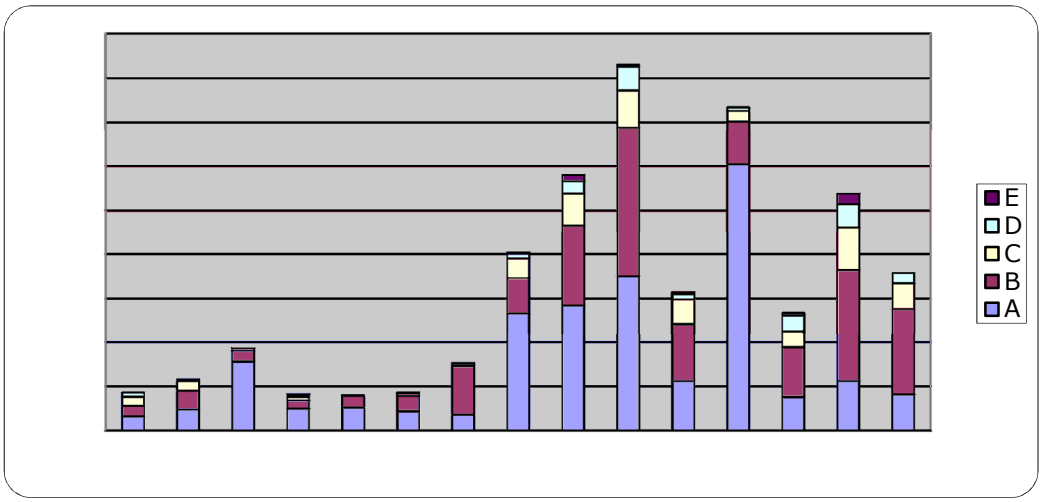

Figure 30. Bone and size frequencies by stratigraphic units

As the nature of the assemblage was highly fragmented, preliminary identification has focused on broad groupings:

Homo sapiens (HOSA-3 pieces from unit 45), *Bos taurus* (BOTA), *Cervus elaphus* (CEEL), indeterminate large mammal (MGND bones attributable by their size, *Ovis aries* (OVAR), indeterminate ovine or caprine (OVCA), *Sus domesticus* (SUDO), indeterminate small carnivore (CARN), indeterminate medium sized mammal (MMND), indetereminate mammal (MND). Mammal bones are the second most common remains, with fish being the most common in units 40, 70 y 75. Indeterminate birds (AVES ND) and amphibians (FROG) were also identified..

STRAT. Unit	Total HOSA	Total BOTA	Total CEEL	Total MGND	Total OVAR	Total OVCA	Total SUDO	Total littl CARN	Total MMND	Total MND	Total MPND	mammal bones	Total AVEND	Total FISH	Total FROG	Total ND	Total general
3									13			13		29			42
5			1						18			19	1	36		87	143
6									9			9	1	87			97
10			3						15			18		108			126
25									17			17		163			180
30									42			42		118			160
35									73			73		218			291
40			1						30	91		122		8			130
45	3		2		1	3			153			162		443			605
50		21		1	2	35			147		5	211		349		179	739
55		9		2	2	4			41	46		104	4	207		16	331
60		1	2						52			55		302			357
65			4			3			16	39	5	67	7	159		43	276
70		9	1	6		29			7	9		61		13		92	166
75		3		3	1	14				68		89		8			97
UNST		8	1		1	6	1	3	25			45	5	103	1	61	215
Total gener	3	51	15	12	7	81	1	3	658	244	10	1085	18	2351	1	478	3955

Table 2. Animal bones, Camas Beach Cave

Samples sizes are too small to develop any insights into dynamics of exploitation of the fauna.

Overall, the most common taxon, in terms of number of bones, following fish, are the ovi-caprines, though of these, we are only able to positively confirm sheep; following this the next most common is cattle. The most common non-domesticated fauna is red deer; there is only one pig bone. Three human adult teeth (two incisors and one canine) were also found. We cannot be sure that the bird and amphibian reains were brought to the sites by human agency. Ovine remains include teeth (adult and juvenile), humerus, pelvis, tarsus and phalanges. Indeterminate ovicaprine bones also include skull, front leg, ribs and vertebrae.

Cattle are represented by teeth representing one juvenile animal and one adult. Red deer are represented by teeth, and fragments of extremitites including carpus, phalanges and a distal fragment of tibial diaphysis.

Some bones have evidence of fire (burnt black, grey or white). Two bones have cut marks and one red deer tibia has evidence of scraping.

In summary, most of the animal bones come from domesticated species, with the exception of the red deer (though in this case the evidence suggests that only parts of the animal have been brought to the cave.

9.2 Uamh an Dòbhrain (Otter cave)

Animal remains were recovered from contexts and cuts B2, B3, C1, C2. Only a few bones were recovered so we have lumped all the bones from each stratigraphic unit together (B, C). Fish remains are the most common in all contexts. Most bones come from level C.

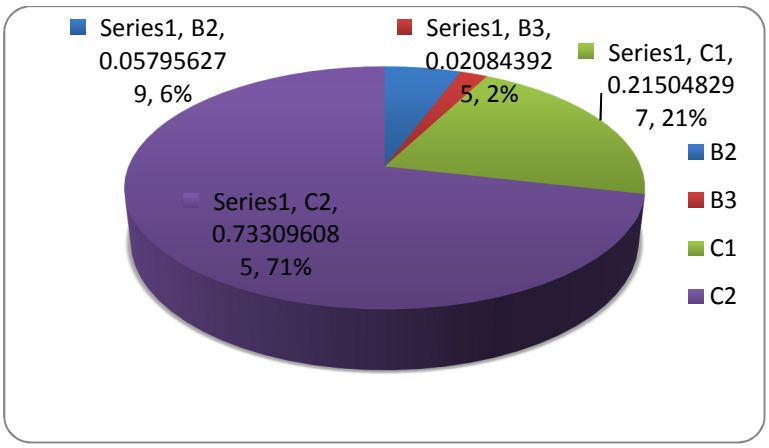

Figure 31. Percentage of figures from different contexts.

As with Camas Beach cave, bones are highly fragmented and most bones fall into the smallest size catergory. There is though a difference between the upper level (B) which has a predominance of slightly larger bones (size catergory B) and the lower level (C) which has a prediminance of the smallest (Size category A) bones.

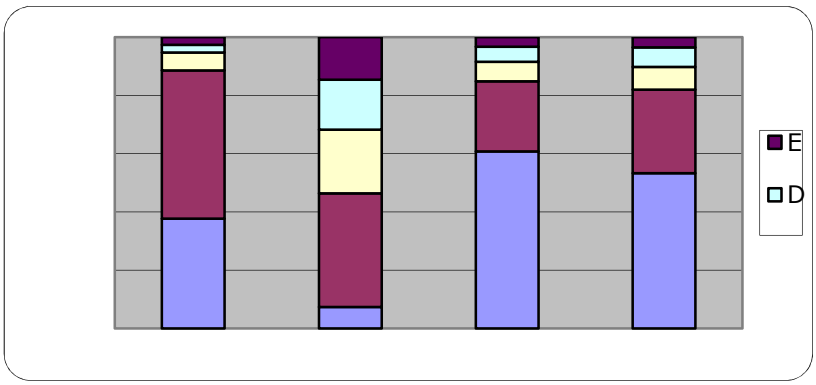

Figure 32. Percentages of size catergories of bones according to context.

Though the sample is small, cattle predominate, following by pig, (SUDO y SUND) and red deer (CEEL) which equal the total for all the ovine-caprides (one sample has been securely identified as domesticated goat, and 6 as sheep OVAR). There is only one bird bone.

Total CEEL	7
Total SUDO	8
Total SUND	1
Total BOTA	12
Total CPHI	1
Total OVAR	6
Total OCND	3
Total MMND	214
Total MND	168
Total AVE	1
Total AMFIBI	1
Total ND	18
Total general	459

Table 3. Animal bones, Uamh an Dòbhrain

Red deer is represented by a wide range of skeletal elements. Pig is represented by phalanges, tibia, scapula, and one juvenile mandible. Cattle is predominantly represented by ribs, the goat by a phalange, the sheep by two fragments of scapula and one femur, the ovicaprinae by rib fragments, vertebrae and other large bones.

To summarise, at Uamh an Dòbhrain as at Camas Beach cave, the fauna represented is predominantly domesticated, although here, there are higher numbers of sheep and pig. Red deer is also more common, and sheep and goat are also present.

One sheep femur and one red deer femur and a rib have chopping marks, 6 cattle rib bones, one pig tibia and one pig scapula and 6 indeterminate bones have cut marks. One mandible has slice marks. 228 bones have evidence of heating (black, white and brown burn marks).

10. Assessment of the fish bones from Uamh an Dòbhrain and Camas Beach Cave.

Rachel Parks, *fishlab*, Department of Archaeology, University of York

10.1 Method

Fish bones from Uamh an Dòbhrain (otter Cave) and Camas Beach Cave were assessed for percentage abundance of taxa by context, approximate size of fish and preservation of the material.

10.2 Uamh an Dòbhrain (Otter Cave)

Despite the name of the cave the fish remains do not have evidence of the concretion typical of otter spraint remains. The majority of specimens were well preserved, original bone surface was intact and elements over 50% complete. Saithe is the most predominant species, of these most were noted to be around 30cm estimated total length with a few specimens greater than 50cm estimated total length.

	Saithe *Pollachius virens*	Conger eel *Conger conger*	Corkwing wrasse *Symphodus melops*	Gurnard family Triglidae	Perch family Percidae
C1	81-100%	0-20%	0-20%		
C2	41-60%		20-40%	20-40%	
B2	41-60%				41-60%
B3	81-100%				

Table 4. Otter cave percentage abundance of taxa by context

10.3 Camas Beach

Preservation of the fish bone was generally fair; less than 50% of the specimens showed a flaky texture and elements were generally greater than 50% complete. A range of fish sizes were noted, in particular several larger specimens of either saithe or pollack greater than 50 cm estimated total length.

	Saithe *Pollachius virens*	Saithe or Pollack *Pollachius*	Eel *Anguilla anguilla*	Herring *Clupea harengus*	Ballan wrasse *Labrus bergylta*
CB-5		81-100%			
CB10	81-100%				
CB-25	81-100%				
CB-30	81-100%		0-20%		
CB-35	41-60%	41-60%			
CB-40	81-100%				
CB-45		81-100%			
CB-50	81-100%	0-20%		0-20%	
CB-55	81-100%				
CB-60	81-100%	0-20%			
CB-65	81-100%				0-20%
CB-70		81-100%			
CB-75	81-100%				
Trench 1 c.005		81-100%			
Trench 1 c.003		81-100%			
Trench 1 c.006	41-60%			41-60%	

Table 5. Camas Beach percentage abundance of taxa by context

10.4 Summary and scope for further work

Full analysis of the material will give a more detailed picture of the assemblages including element representation and fish size. Element representation can inform fish processing. For saithe especially, the size, and therefore age of the fish has a direct bearing on the habitat. Element representation and fish size are key to the understanding of fishing practices at the sites.

11 Preliminary Analysis of the Marine Molluscs from Excavations Undertaken at Camas Daraich Beach shelter (CB) and Uamh an Dòbhrain (Otter Cave), Isle of Skye 2010

Eva M Laurie

11.1 Introduction

This report is a preliminary analysis of the marine mollusc shells found at the rock shelter site at Camas Beach Cave (CB) and Uamh an Dòbhrain (Otter Cave) site excavated on the Isle of Skye in May 2010. A more detailed report will be available at a later date. The main aim is to identify any changes in marine molluscs relating their size and the percentages of species present in the stratigraphic levels.

11.2 Methodology

The methodology followed in this analysis is listed below.

- Totally unsorted excavation samples were requested from each stratigraphic level found in both sites.
- The samples were sieved in the laboratory and material separated into residues, marine mollusc species and other materials such as fish bone, stone and charcoal.
- All whole shells were measured in mm using at least two dimensions (see Figures 1 and 2).
- There may be as many as three Patella species present but archaeological Patella shells are difficult to identify into species so for the purposes of this paper all three species will be treated as one entity.

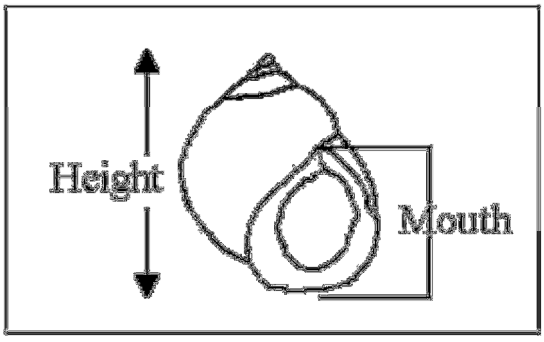

Figure 33. Measurements made on Littorina littorea (L) (Edible Periwinkle) shells.

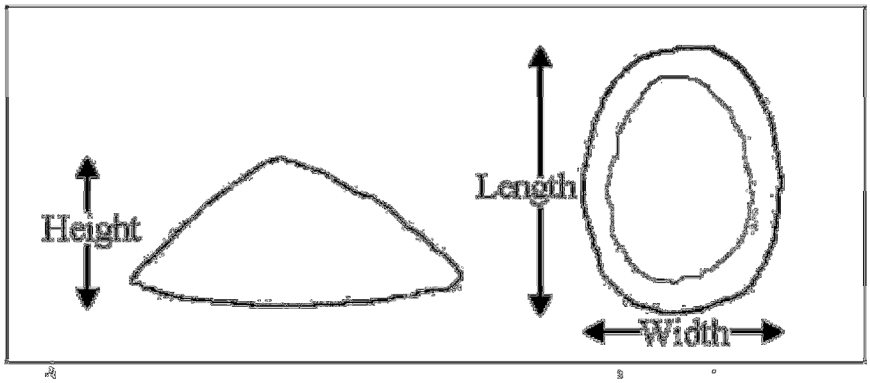

Figure 34. Measurements made on Patella species shells.

- An MNI (Minimum Number of Individuals) count was made for all species using whole apices for gastropods and whole beaks or hinges for bivalves. The bivalve shells were separated into left and right valves in order not to inflate the MNI. This figure has not been used in the current analysis but will be used in the full report to be presented at a later date.
- All whole shells and shell fragments of the individual species were weighed in grams.

10.3 Discussion

In Camas Beach cave a sample of the 5 upper humus layers (divided in 3 different surface locations A,B,C) was analysed. The levels below 006-007 were sampled as a whole. All the following stratigraphic units of the shell midden were sampled and analysed.

At Uamh an Dòbhrain (Otter Cave) a series of samples were taken from levels B and different cuts of levels C2 and C3.

The following analysis will concentrate on the Patella species and the *Littorina littorea* (L) recovered from the deposits as the other marine species are only present in very small amounts and it is thought that their presence is due to incidental rather than purposeful collection (see Appendix 6).

10.4 Size

All whole *L littorea* and Patella shells were measured and one dimension was chosen for the following size table. For *L.littorea* the height measurement was used and for the Patella species the length measurement. The average size was then calculated for each level and this is shown in Table 6.

Camas Daraich Rock Shelter			Uamh an Dòbhrain (Otter Cave)		
Stratigraphic Level	Edible Periwinkle *Littorina littorea*	Limpet Patella species	Stratigraphic Level	Edible Periwinkle *Littorina littorea*	Limpet Patella species
CT1 A	22.54	26.84	B2	21.81	32.83
CT1 B	22.85	26.26	C1 1° Cut	22.01	30.44
CT1 C	22.60	26.65	C1 2° Cut	23.26	33.15
CT1 006/007	22.25	28.93	C1 3° Cut	23.94	33.49
CB5	22.53		C2 1° Cut	22.27	21.07
CB10	22.96	29.59	C2 2° Cut	22.40	25.37
CB15	21.90	32.42			
CB20	22.24	31.68			
CB25	21.44	31.70			
CB30	21.82	33.63			
CB35	22.44	32.20			
CB40	23.28	30.87			
CB45	21.88	32.29			
CB50	22.38	32.73			
CB55	22.44	32.53			
CB60	22.31	32.92			
CB65	22.65	34.52			
CB70	23.63	33.75			
CB75	23.60	27.32			
		33.57			

Table 6: Average shell size comparison between stratigraphic levels at Camas Daraich rock shelter and Bluebell cave.

10.5 Camas Daraich Rock Shelter

The *L. Littorina* are under 23mm in all except three levels at Camas Daraich beach. Level CB40 has an average *L. Littorina* size of 23.28mm the two other levels with shells over 23mm are the lowest levels CB70 with an average of 23.63mm and CB75 with an average of 23.60mm. The top levels, CT1 to CT 006/007, and CB5 all have Patella species with an average size below 30mm

along with one other level CB70. Levels CB10 to CB55 averages range between 30.87mm and 32.92 with only one level in this spread reaching over 33mm that being CB25 at 33.63mm. CB60, CB65 and CB75 have the largest average sizes ranging from 33.57mm to 34.52mm. The shells from the lower levels of each species, CB70 and CB 75 for the *L. littorea* and CB60, CB65 and CB75 for the Patella species, are marginally larger than those found in higher levels could indicate some kind of environmental change. However there does not appear to be any correlation between the *L. Littorina* size changes and the Patella size changes in the other levels so it seems unlikely that significant environmental change is present. It may be that the larger size in the lowest levels indicates slightly older mollusc populations suggesting that the lowest levels relate to a relatively undisturbed wild population and that when regular collection of these species occurred it led to an overall younger mollusc population that is reflected in the smaller average size in most of the subsequent levels.

10.6 Uamh an Dòbhrain

In Uamh an Dòbhrain the *L. Littorina* from B2 has the smallest average size at 21.81mm. The largest shells were found in Levels C1 2° Cut and C1 3° Cut with the two C2 levels being most similar in size to C1 1° Cut. The C2 patella samples show low average sizes but in these two levels the sample size was very small, only two in C2 1° Cut and only one in C2 2° Cut, consequently it is deemed unsafe to accept these figures as such small numbers cannot be held to represent a population and they have to be disregarded as part of the size analysis. The other levels all have average sizes of over 30mm ranging from 30.44mm to 33.49mm with CT1 2° Cut and CT1 3° Cut displaying the largest shells. This may prove interesting as more excavation is done in this location as these two levels also have the largest *L. littorea* shells. If a correlation does exist through further levels it may represent some environmental change or possibly indications of lengthier times between collection episodes which allowed the mollusc population to fully recover from the depredation.

10.7 Weight

10.7.1 Camas Beach Rock Shelter

When weight of shell is used only two levels at Camas Daraich Beach have more *L. littorea* than Patella species, CB50 and CB75, all other levels have higher Patella weights. Although the figures vary considerably throughout the levels, from 47.67g in CB70 to 18.54g in CB60 most *L. littorea* are between 25% to 33% of the total weight. The two lowest levels, CB70 and CB75 are quite interesting as they show a close to 50/50 split between the two species followed by a drop in *L.*

littorea to 25% in CB65 and a further drop to below 20% in CB60. This is followed by arise to just above 20% in CB55 and a further rise to over 60% in CB50. This could be sign of a population crash which could be due to environmental changes, although this seems unlikely as the Patella population does not appear to have fallen or to disease which did not affect the Patella or possibly to over collection or to a combination of the above factors.

Camas Beach			Uamh an Dòbhrain (Otter Cave)		
Stratigraphic Level	Edible Periwinkle *Littorina littorea*	Limpet Patella species	Stratigraphic Level	Edible Periwinkle *Littorina littorea*	Limpet Patella species
CT1 A	42.04	55.93	B2	26.62	69.35
CT1 B	39.62	59.62	C1 1° Cut	32.01	57.36
CT1 C	44.35	55.31	C1 2° Cut	35.12	61.24
CT1 006	25.64	73.56	C1 3° Cut	47.35	51.87
CT1 007	33.36	65.78	C2 1° Cut	70.58	28.84
CB5	31.78	67.93	C2 2° Cut	71.51	26.96
CB10	27.82	75.15			
CB15	37.27	62.57			
CB20	34.20	65.58			
CB25	22.32	76.80			
CB30	30.02	69.86			
CB35	26.38	73.22			
CB40	43.55	56.16			
CB45	22.17	77.60			
CB50	61.79	36.56			
CB55	20.77	78.79			
CB60	18.54	80.50			
CB65	25.29	74.45			
CB70	47.67	51.74			
CB75	53.45	45.58			

Table 7. Weight analysis by species percentage for Littorina littorea and Patella species from Camas Beach and Uamh an Dòbhrain (Otter Cave).

10.8 Uamh an Dòbhrain

The two lowest levels, C2 1° Cut and C2 2° Cut, at Bluebell cave are dominated by *L. littorea*. This is followed by a nearly 50/50% split in level C1 3° Cut with the Patella becoming the dominant species in the higher levels.

There are several factors which could be the cause of the differences in weight and size throughout the levels at both sites and they are listed below:

- Environmental change.
- Disease.
- Natural predation by molluscs such as whelks.
- Over collection with not enough time between episodes for full population recovery.
- Preference change perhaps due to end use for instance bait instead of direct food.

Environmental change seems unlikely as the Patella do not follow the same pattern of early size decrease displayed by *L. littorea*, showing no significant reduction in size until CB5 at Camas Daraich and none at Bluebell cave. There could have been an outbreak of disease that only affected *L. littorea* but that is something that cannot be proved by looking at the shells alone. An increase in natural predation by on *L. littorea* by other creatures such as whelks is possible but why were the Patella not affected as well? The fourth factor that may have influenced the reduction in *L. littorea* size and percentages could relate to over collection by humans which did not allow them to reach the same age as would have been reached in an untouched population. It also possible that people's preference changed but again the reduction in size points to this being unlikely. It is suggested that the most likely cause of the size reduction in *L. littorea* at both sites and the later size reduction in Patella at Camas Daraich is due in some manner to their exploitation by people.

10.9 Further Analysis

Further analysis of the material will be dealt with in the final report to be issued at a later date and will include the following:

- Analysis of the modern mollusc collection made at Camas Daraich beach May 2010.
- Comparison of the modern collection with the archaeological collection.
- Incorporation of the MNI evidence.
- The sorting and analysis of the small marine and terrestrial molluscs.

12. Radiocarbon dates.

Nine radiocarbon dates were obtained, 7 at the SUERC laboratory, University of Glasgow and three at the radiocarbon laboratory in Oxford. Further dates are pending.

Lab code	Site	Age BP uncal.	95.4% probability
GU-20358	Uamh an Dòbhrain NM 5609 9977	1935 ± 30	130AD
GU-20359	Uamh an Dòbhrain NM 5609 9977	435 ± 30	1410 -1620AD
GU-20360	Uamh an Dòbhrain NM 5609 9977	2155 ± 30	360-90BC
GU-20361	Uamh an Dòbhrain NM 5609 9977	1275 ± 30	660AD-810AD
OxA-22510	Uamh an Dòbhrain NM 5609 9977	348 ± 22	1463-1635AD
OxA-22511	POS 105 NM 5607 9988	334± 23	1481-1640AD
GU-24358	Camas Beach NM 5672 9997	63±30	1280-1400AD
GU-20362	Glenelg 5 NG 7961 2215	390 ± 30	1440-1640AD
GU-20363	RFG 05 NG 5864 4282	925 ± 30	1020-1180AD
OxA-22512	RFG 01 NG 5861 4291	2260± 25	395-209BC

Table 8. Radiocarbon dates.

13. Environmental investigations at Point of Sleat and Staffin

Katherine Selby, Rosie James and Renee van de Locht

13.1 Aims:

1. To undertake an extensive survey of all geomorphological features related to former sea levels.
2. To undertake an extensive survey of Mesolithic and Neolithic archaeological features.
3. To geomorphologically map the areas under investigation.
4. To enter all survey data into a Geographical Information System (GIS) to allow visualisation of the changing environmental conditions with various past sea level scenarios and relate these to archaeological evidence.

13.2 Methods:

In May 2010 fieldwork was undertaken at two coastal sites on the Isle of Skye, Scotland. The first site was the Point of Sleat (NG 56400030) on the south of the island, which has a crenulated coastline with numerous inlets and caves surrounding a paleolake. The second site was Staffin (NG 47656860), on the northern coast with larger bays and more distinct features. In the field, an extensive survey using a Geodimeter (TCR1100) was undertaken. Survey points of x,y, and z (elevation) coordinates were recorded across the areas, ensuring all geomorphological features related to sea level change and any Mesolithic and Neolithic archaeological features were included. The survey data was downloaded and entered into a GIS package (ArcMap 9.3.1). Through inverse distance weighting interpolation, detailed digital elevation models were created for the sites. Maps were developed for each site, with a range of simulated sea level altitudes, allowing changing environmental conditions and availability of terrestrial resources to be assessed (see Location Map). Detailed geomorphological maps were also drawn in the field and later digitised using Adobe Illustrator (see N inlet Geomorphological Map). These contained qualitative information about the character of the changes of slope, for example whether there were bedrock outcrops or pebble ridges, to aid interpretation of the GIS elevation models.

13.3 Results:

Over 2000 survey points were collected at Point of Sleat and 900 at Staffin, therefore allowing the construction of extremely detailed maps. The sea level scenario maps clearly demonstrate the altitude of sea level required for marine inundation of the paleolake at the Point of Sleat (> 4 m). This corroborates with the location of the rock sill at 4.13 m OD, between one of the inlets and the paleolake, proposed by Selby (1997). The geomorphological maps constructed for Point of Sleat show evidence of a suite of barriers lying from *circa* 20 m OD (which corresponds to the

altitude of a Mesolithic site) down to *circa* 3 m OD, recording past sea level changes in the area. This spatial data can be combined with past sea level reconstructions derived from stratigraphical analysis undertaken by Selby (1997), to aid temporal interpretation.

13.4 Discussion:

This work is still in its early stages and remains to be fully integrated with the archaeological investigations. The GIS maps clearly allow a very visual assessment of the changing environmental conditions and when combined with the radiocarbon chronology, the sea level record and the archaeological evidence, will enable an holistic interpretation of the sites to develop.

14. The geological setting of the caves at Point of Sleat.

Laela Winkelmann

14.1 Stratigraphy

The rocks around the Point of Sleat are Precambrian meta-sediments. They are within the Tarskavaig Nappe and have been broadly accepted as the Tarskavaig Moines. As they are bounded on all sides by thrusts, their position in the stratigraphy of Scotland is unclear but we know they traveled a good distance along the thrust plane from the South East. They may correlate to the loch-eil group of the Torridonian sandstones but they are much more intensely deformed. The Tarskavaig Moines unconformably overly the Lewisian basement.

This stratigraphic column was worked out by Cheeney and Matthews (1965) using origional sedimentary features.

MOINE THRUST PLANE

Aruisg psammite group

Laidhe na Greine group

Capistal psammite group

~~~~~~~~

Lewisian

TARSKAVAIG THRUST PLANE
~~~~~~~~

14.2 Lithology

The lithology is inter-bedded psammites and pelites. The changes in lithology are thought to reflect the origional facies but sedimentary features are difficult to identify. The parent rocks would have been mainly sandstones interbedded with mudstones and shale in places, possibly as in a lagoon environment.

Figure 35: The darker foliated rock above is pelite and the lighter, more homogenous rock below is psammite

The psammites are stronger, less plastic and more prone to shearing than the easily folded pelites. The entire area has undergone repeated episodes of deformation and the resultant geology is complex but the overall grade of metamorphism is quite low; Garnet grade and green schist are both suggested in literature but some locally intense deformation has resulted in rocks that are both mylinised and migmatised.

Figure 36 Uamh an Dòbhrain to the East of the Point

Figure 37 The cave on the West of the Point peninsula. The psammite overlies a finer semi-pelitic rock and the cave is eroded out of the contact.

14.3. Dykes

The entire area of Sleat is regularly transected by tertiary dykes which locally have a NW/SW orientation and occurred during the British Tertiery igneous period when the Cuillins and Rhum were formed. There are also a few older dykes in the area. Dykes often result in a break in relief in the landscape. Where the country rocks are faster to erode the dyke stands proud and where the country rocks are slower to erode the dyke is eroded out leaving a low level linear feature behind. There is a large dyke, which has been eroded in this way, that cuts the point peninsula in a NW/SW orientation.

The caves are found near the Point of Sleat in the Aruisg Psammite group of the Tarskavaig Nappe. The caves are formed by the erosion of softer material from beneath a stronger material. In the case of the two caves nearest the point, this softer material is a pelitic layer.

The cave above the Camus Daraich beach is formed in the core of an antiform. The core material is pelite. The folding was intense enough to produce seams of migmatite and these, have been eroded out. The process of erosion is probably marine if sea levels were high enough. The psammitic layers have remained as the roof of the cave. The structure has become unstable and there is a lot of rockfall where the roof has collapsed indicating the cave once extended much further than at present.

14. 4 Landscape

The terrain around the point is very rough. The rocks are mostly dipping at 30 to 60 degrees to the south west and the pelitic layers erode away leaving stronger sandier layers behind. These psammitic protrusions eventully become unstable and break off falling as large slabs and boulders. The whole is regularly sliced through by dykes which form deep gullies and inlets in the coastline. Further north, towards the township and the beach the landscape is softened by drift; The current sandy beach, raised beaches and peat all provide an easier terrain for walking.

15. Modern shell reference collection *Andre Colonese, Eva Laurie*

Marine environments of the North East Atlantic are marked by a pronounced seasonal productivity, which supports large shoals of fish, benthic invertebrates, seabirds and cetaceans. Local archaeological evidences attest the importance of this production for coastal societies since the middle Holocene, as demonstrated by numerous evidence of intensive exploitation of littoral resources, in particular molluscs. Economic rate of returns from intertidal environments are expected to vary according to distribution and abundance of resources. Areas with different

possibility and resource predictability may exist over relatively short distance, and this may require specific response from hunter-gatherer foraging strategies in coastal environments. In this work we analyze the distribution and the abundance of intertidal rocky shore molluscs from the SW coast of Skye (Celtic Seas, OSPAR definition). The main goal was to evaluate economic returns over short distance (in nutritional terms) and their implications for local prehistoric coastal economy. Four distinct sites were analyzed (from sheltered to moderately exposed coastal areas) over a distance of about 5 kilometres. The distribution and the abundance of species differed significantly between samples areas. Species richness and abundance were higher in moderately exposed rocky shores compared with sheltered counterparts. Species abundance was higher at low tide, specifically at -30m from the highest tide margin and in coastal areas with emerged kelps beds at low tide. *Littorina* sp. was very abundant in these areas, while *Patella* sp. was scarce. By contrast, *Patella* sp. dominates rocky shores with no kelp beds, while *Littorina* sp. was almost absent. Our study demonstrates that economic advantages from intertidal rocky shore environments may vary considerably over short distance even in highly productive coastal areas. Distribution and abundance of species offer catchments area with different possibility and resource predictability for hunter-gatherers, with potential implications. Over the course of one year (2008 – 2009), monthly collections were made of sea water, temperature records and samples of *Patella sp.* at Sand beach, Applecross, to evaluate the potential for stable isotope analysis.

16. Ongoing and future work 2011-2012.

Amino acid racemization (University of York).

Stable isotope /seasonality limpets periwinkles (UAB and University of York).

Micromorphology, Camas Daraich.

Lipid analysis, Camas Daraich.

Environmental reconstruction.

Geochemical analysis of pumice stones.

Conferences. Papers will be presented at the EAA conference in Oslo, September 2011, and at the HOMER 2011 conference in Rennes, September- October 2011.

Fieldwork September 2011. The aim of this season is to assess the age range of the two shell middens, Camas Beach and Uamh an Dòbhrain.

The Mesolithic site at Camas Daraich will be completed in 2012 following analysis of the micromorphology results.

A shovel pitting programme wil be implemented in the future to explore areas not adjacent to the shoreline.

We are also in the process of establishing a working connection with the Scottish Canoe Association and the National Kayak School, Oban.
All drawings will be done once the excavations are complete and the sites are fully understood.

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Appendix 2 List of Raasay rockshelters with shell middens.

Oriol Lopez.

Name: POS-030					Date: 16-04-2009
Type of structure: NO STRUCTURE; CLEANING UP PROFILE ABOVE THE BEACH				GPS	NG: 5555 BNG: 0126
Size:					ALTITUDE: 8m
TP	Sample	Depth	Volume (l.)	Processing results	Observations
Soil description: PLENTY SHELLS					
Pictures: from SKYE'09-102 to SKYE'09-106					

Name: POS-002					Date: 16-04-2009
Type of structure: POSSIBLE GREEN MOUND				GPS	NG: 5577 BNG: 0120
Size:					ALTITUDE: 20
TP	Sample	Depth	Volume (l.)	Processing results	Observations
Pictures: SKYE'09-109					

Name: POS-003					Date: 16-04-2009
Type of structure: SEA LEVEL CAVE				GPS	NG: 5577 BNG: 0120
Size:					ALTITUDE: 20m
TP	Sample	Depth	Volume (l.)	Processing results	Observations
Pictures: SKYE'09-110					

Name: POS-004					Date: 16-04-2009
Type of structure: POSSIBLE MOUNDS				GPS	NG: 5596 BNG: 0109
Size:					ALTITUDE: 37M
TP	Sample	Depth	Volume (l.)	Processing results	Observations
Pictures: SKYE'09-111					

Name: POS-005					Date: 17-04-2009
Type of structure: SHELTER				GPS	NG: 5577 BNG: 0137
Size:					ALTITUDE: 35M
TP	Sample	Depth	Volume (l.)	Processing results	Observations
1	-	<3CM			STOP FOR ROCK
2	-	<3CM			STOP FOR ROCK
3	-	<3CM			STOP FOR ROCK

4	-	<3CM			STOP FOR ROCK
5	-	<3CM			STOP FOR ROCK
6	-	<3CM			STOP FOR ROCK
7	-	<3CM			STOP FOR ROCK
8	-	<3CM			STOP FOR ROCK
9	-	<3CM			STOP FOR ROCK
10	-	<3CM			STOP FOR ROCK
11	-	<3CM			STOP FOR ROCK
12	-	<3CM			STOP FOR ROCK
Soil description: NO SAMPLES, BECAUSE 3CM BELOW DE FLOOR THERE WAS A STONE LEVEL					
Pictures: SKYE'09-112 and SKYE'09-113					

Name: POS-006					Date:17-04-2009
Type of structure: SHELTER				GPS	NG: 5578 BNG: 0157
Size:					ALTITUDE: 21M
IN THE NORTH SIDE OF THE RIVER. IN THE MAP, IT'S CALLED "ALLT NA DOIRIONAICH"					
TP	Sample	Depth	Volume (l.)	Processing results	Observations
1	1	0-10cm	0'2	C	
1	-	10-20CM			
Pictures: from SKYE'09-114 to SKYE'09-116					

Name: POS-007					Date: 17-04-2009
Type of structure: SHELTER				GPS	NG: 5579 BNG: 0159
Size:					ALTITUDE: 17M
TP	Sample	Depth	Volume (l.)	Processing results	Observations
1	-	10CM			STOP FOR ROCK
2	-	10CM			STOP FOR ROCK
Soil description: 10CM OF SOIL, UNDER IT, ONLY ROCK					
Pictures: SKYE'09-117					

Name: POS-008			Date: 17-04-2009
Type of structure: SHELTER		GPS	NG: 5571 BNG: 0162
Size:			ALTITUDE: 20M

TP	Sample	Depth	Volume (l.)	Processing results	Observations
1	-	5CM			STOP FOR ROCK
Soil description: 5COM OF SOIL, UNDER IT, ONLY ROCK					
Pictures: SKYE'09-118 and SKYE'09-119					

Name: POS-009					Date: 17-04-2009
Type of structure: SHELTER				GPS	NG: 5569 BNG: 0164
Size:					ALTITUDE: 7M
TP	Sample	Depth	Volume (l.)	Processing results	Observations
1	-	7CM			STOP FOR ROCK
2	-	7CM			STOP FOR ROCK
Soil description: 7CM OF SOIL, UNDER IT, ONLY ROCK					
Pictures: SKYE'09-120					

Name: POS-010					Date: 17-04-2009
Type of structure: SHELTER				GPS	NG: 5554 BNG: 0206
Size:					ALTITUDE: 6M
LITTLE SHELTER PROTECTED FROM EROSION					
TP	Sample	Depth	Volume (l.)	Processing results	Observations
1	-	0-20CM			STOP FOR ROCK
Pictures: SKYE'09-121					

Name: POS-011					Date: 17-04-2009
Type of structure: SHELTER				GPS	NG: 5555 BNG: 0205
Size:					ALTITUDE: 12M
TP	Sample	Depth	Volume (l.)	Processing results	Observations
1	-	<10CM			STOP FOR ROCK
2	-	<10CM			STOP FOR ROCK
3	-	<10CM			STOP FOR ROCK
Pictures: SKYE'09-122					

Name: POS-012			Date: 17-04-2009
Type of structure: SHELTER		GPS	NG: 5549 BNG: 0207
Size:			ALTITUDE: 6M

TP	Sample	Depth	Volume (l.)	Processing results	Observations
1	-	<5CM			STOP FOR ROCK
2	-	<5CM			STOP FOR ROCK
3	-	<5CM			STOP FOR ROCK
4	-	<5CM			STOP FOR ROCK
5	-	<5CM			STOP FOR ROCK

Pictures: SKYE'09-123

Name: POS-013		Date: 17-04-2009
Type of structure: SHELTER	GPS	NG: 5547
		BNG: 0224
Size:		ALTITUDE: 10M

TP	Sample	Depth	Volume (l.)	Processing results	Observations
1	-	<40CM			STOP FOR ROCK
2	-	<40CM			STOP FOR ROCK

Soil description:
SHELLS ON THE SUPERFACE LEVEL, WITHOUT CONTINUITY UNDER IT

Pictures: from SKYE'09-124 and SKYE'09-125

Name: POS-014		Date: 17-04-2009
Type of structure: SHELTER	GPS	NG: 5547
		BNG: 0230
Size:		ALTITUDE: 8M

NEAR THE COAST LINE

TP	Sample	Depth	Volume (l.)	Processing results	Observations
1	-	<25CM			STOP FOR ROCK
2	-	<25CM			STOP FOR ROCK
3	-	<25CM			STOP FOR ROCK

Pictures: SKYE'09-126 and SKYE'09-127

Name: POS-015		Date: 17-04-2009
Type of structure: SHELTER	GPS	NG: 5546
		BNG: 0232
Size:		ALTITUDE: -

THE SHELTER HAVE BEEN REMOVED FOR AN ANIMAL AND THERE'RE SHELLS ON THE SURFACE.
THERE CAN BE A SHELL MIDDEN UNDER THE ROCK.

TP	Sample	Depth	Volume (l.)	Processing results	Observations
1	-	<5CM			STOP FOR THE ROCK
2	-	<5CM			STOP FOR THE ROCK

Pictures: SKYE'09-128 to SKYE'09-130

Name: POS-016	Date: 17-04-2009

Type of structure: SHELTER					GPS	NG: 5545
						BNG: 0233
Size:						ALTITUDE: 5M
TP	Sample	Depth	Volume (l.)	Processing results	Observations	
1	-	<10CM			STOP FOR ROCK	
2	-	<10CM			STOP FOR ROCK	
3	-	<10CM			STOP FOR ROCK	
Pictures: SKYE'09-131 and SKYE'09-132						

Name: POS-017					Date: 17-04-2009
Type of structure: SHELTER				GPS	NG: 5546
					BNG: 0234
Size:					ALTITUDE: 6M
TP	Sample	Depth	Volume (l.)	Processing results	Observations
1	-	20CM			STOP FOR ROCK
2	-	10CM			STOP FOR ROCK
3	-	10CM			STOP FOR ROCK
Pictures: SKYE'09-133					

Name: POS-018					Date: 17-04-2009
Type of structure: CAVE				GPS	NG: 5541
					BNG: 0234
Size:					ALTITUDE: 1M
BIG CAVE ON THE COAST LINE. THE FLOOR IS COVERED OF RUBBISH. NO INTERESTING					
TP	Sample	Depth	Volume (l.)	Processing results	Observations
Pictures: SKYE'09-137					

Name: POS-019					Date: 17-04-2009
Type of structure: SHELTER				GPS	NG: 5538
					BNG: 0258
Size:					ALTITUDE: 8M
TP	Sample	Depth	Volume (l.)	Processing results	Observations
1	-	20CM			STOP FOR ROCK
Pictures: SKYE'09-134					

Name: POS-020					Date: 17-04-2009
Type of structure: SHELTER				GPS	NG: 5534
					BNG: 0256
Size:					ALTITUDE: 9M
TP	Sample	Depth	Volume (l.)	Processing results	Observations

1	-	25CM			STOP FOR ROCK
2	-	25CM			STOP FOR ROCK
3	-	25CM			STOP FOR ROCK
Pictures: SKYE'09-136					

Name: POS-021					Date: 17-04-2009
Type of structure: SHELTER				GPS	NG: 5533
					BNG: 0259
Size:					ALTITUDE: 8M
TP	Sample	Depth	Volume (l.)	Processing results	Observations
1	-				STOP FOR ROCK
Pictures:					

Name: POS-022					Date:18-04-2009
Type of structure: SHELTER				GPS	NG: 5735
					BNG: 9948
Size:					ALTITUDE: 21M
TP	Sample	Depth	Volume (l.)	Processing results	Observations
Pictures: SKYE'09-141					

Name: POS-23					Date: 18-04-2009
Type of structure: CAVE				GPS	NM: 5757
					9965
Size:					ALTITUDE: 7M
CAVE ON THE COAST LINE. DOES'NT SEEM INTERESTING					
TP	Sample	Depth	Volume (l.)	Processing results	Observations
Pictures:from SKYE'09-142 to SKYE'09-145					

Name: POS-024					Date: 18-04-2009
Type of structure: CAVE				GPS	NM: 5751
					9965
Size:					ALTITUDE: ??
CAVE ON THE COST LINE 2 SP, NOT INSIDE, BUT ON THE BASE.					
TP	Sample	Depth	Volume (l.)	Processing results	Observations
1	-	-			STOP FOR ROCK
2	-	-			STOP FOR ROCK
Pictures: SKYE'09-146					

Name: POS-025					Date: 18-04-2009
Type of structure: SHELTER				GPS	NM: 5761 9968
Size:					ALTITUDE: 9M
TP	Sample	Depth	Volume (l.)	Processing results	Observations
1	-	10CM			STOP FOR ROCK
2	-	10CM			STOP FOR ROCK
3	-	10CM			STOP FOR ROCK
Pictures: SKYE'09-147					

Name: POS-026					Date: 18-04-2009
Type of structure: CAVE				GPS	NM 5768 : 9971
Size:					ALTITUDE: 7M
DEEP CAVE COVERED WITH WATER. UNDER THE WATHER YOU CAN SEE SHELLS 1 SP WITH TROWEL AT THE ENTRANCE					
TP	Sample	Depth	Volume (l.)	Processing results	Observations
1	-	10CM			STOP FOR ROCK
Pictures: from SKYE'09-148 to SKYE'09-151					

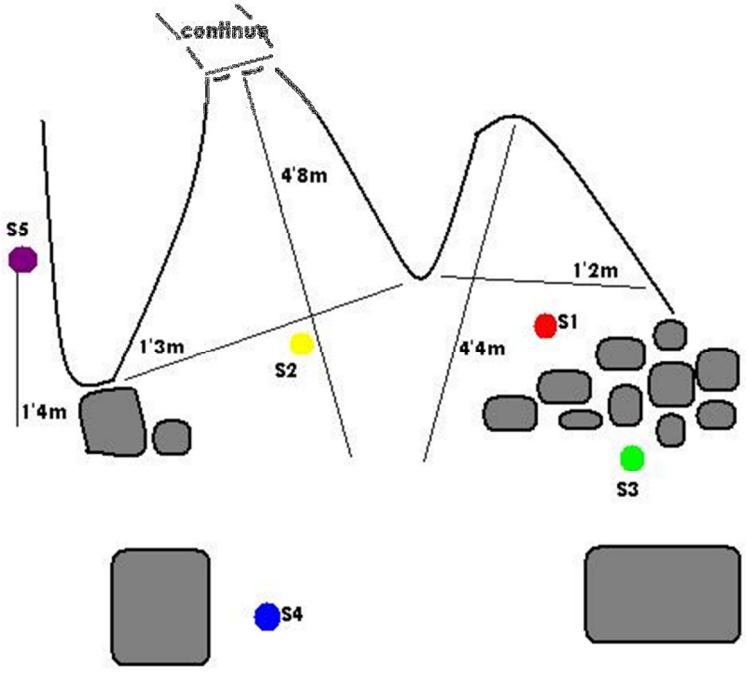
Name: POS-027					Date: 18-04-2009
Type of structure: CAVE				GPS	NG5803 9994
Size:					ALTITUDE: 9M
VERY NARROW CAVE. AT THE BOTTOM OF THE CAVE YOU CAN SEE SHELLS. THERE'S NO POSSIBLE TO TAKE A SAMPLE					
TP	Sample	Depth	Volume (l.)	Processing results	Observations
Pictures: SKYE'09-152					

Name: POS-028					Date: 18-04-2009
Type of structure: SHELTER				GPS	NG: 5823 BNG: 0011
Size:					ALTITUDE:
TP	Sample	Depth	Volume (l.)	Processing results	Observations
1	-	15CM			STOP FOR ROCK
Pictures: SKYE'09-153					

Name: POS-029					Date: 18-04-2009
Type of structure: SHELTER				P	NG: 5850

					: 0007
Size:					ALTITUDE: 6M
UNDER THE ROCK IT SEEMS TO BE A SHELL MIDDEN					
TP	Sample	Depth	Volume (l.)	Processing results	Observations
Pictures: from SKYE'09-154 to SKYE'09-157					

Name: POS-01		Date: 17-04-2009
Type of structure: CAVE	GPS	NM: 5672 9997
Size: >4'9M DEEP, +- 2'5M WIDE		ALTITUDE: 8M



TP	Sample	Depth	Volume (l.)	Processing results	Observations
1	1	30-40CM	0'25	MC,C	
1	2	40-60CM	0'18	MC,IF,C	
1	3	40-60CM	0'33	MC,F,C	
1	4	52-62CM	0'31	MC,F,C	
1	5	60-63CM	0'43	MC,IF,C	
1	6	65-78CM	0'31	MC,C	STOP FOR ROCK
2	-	60CM	-	-	LEAK OF WATER
3	1	30-40CM	0'37	MC,IF,F,C	
3	2	40-45CM	0'5	MC,C	STOP FOR ROCK
4	1	0-20CM	0'25	MC,C	
4	2	20-25CM	0'31	MC	STOP FOR ROCK

5	-	-	-	-	SHELLS ON SURFACE, CAN'T CONTINUE FOR ROCK

Pictures:

Name: POS-100		Date: 18-04-2009
Type of structure: SHELTER	GPS	NG: 5603
		BNG: 0112
Size: H.2'1M, W.5M, D.<2M		ALTITUDE: 36M

DIRECTION W.
RUM, DIRECTLY IN FRONT.
SHALLOW SHELTER, GRASSY FRONT.
SHELTER IN LARGE FOLD- BUSH AP. ABOVE ROCKY SHORELINE

TP	Sample	Depth	Volume (l.)	Processing results	Observations
1	-	-	-	-	STOP FOR ROCK
2	-	-	-	-	STOP FOR ROCK
3	-	-	-	-	STOP FOR ROCK

Pictures:

Name: POS-101		Date: 18-04-2009
Type of structure: SHELTER	GPS	NG: 5652
		BNG: 0052
Size:		ALTITUDE: 31M

TP	Sample	Depth	Volume (l.)	Processing results	Observations

Name: POS-102		Date: 18-04-2009
Type of structure: SHELTER	GPS	NG: 5650
		BNG: 0051
Size:		ALTITUDE: 31M

FORMER SHELTER.
LEVEL OF ROCKS ON THE FLOOR

TP	Sample	Depth	Volume (l.)	Processing results	Observations

Pictures:

Name: POS-103		Date: 18-04-2009
Type of structure: SHELTER	GPS	NG: 5611
		BNG: 0007
Size:		ALTITUDE: 23M

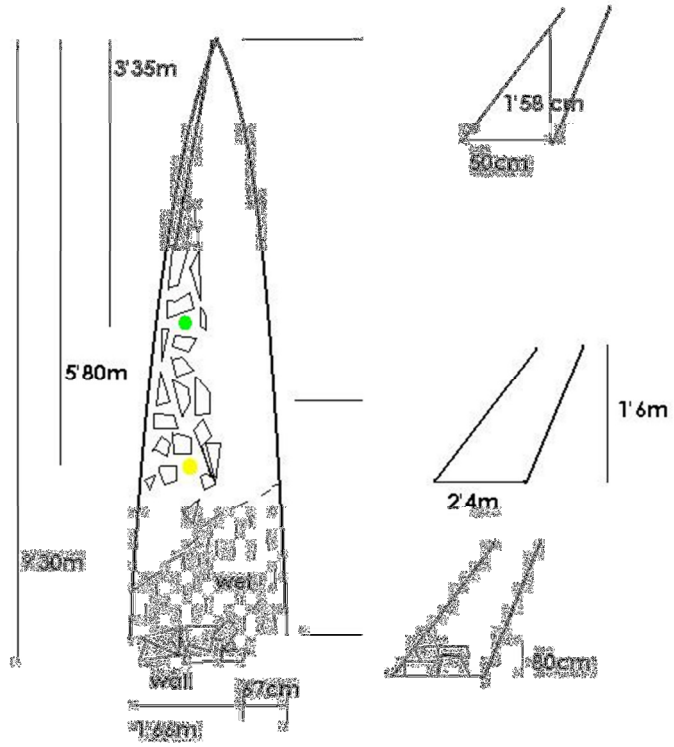
TP	Sample	Depth	Volume (l.)	Processing results	Observations
1	-	20CM	-	-	STOP FOR ROCK

Pictures:

Name: POS-104	Date: 18-04-2009

Type of structure: SHELTER					GPS	NM: 5614 9993
Size:						ALTITUDE: 19M
TP	Sample	Depth	Volume (l.)	Processing results	Observations	
1	-	-	-	-	NO SEDIMENT, ONLY ROCK	
Pictures:						

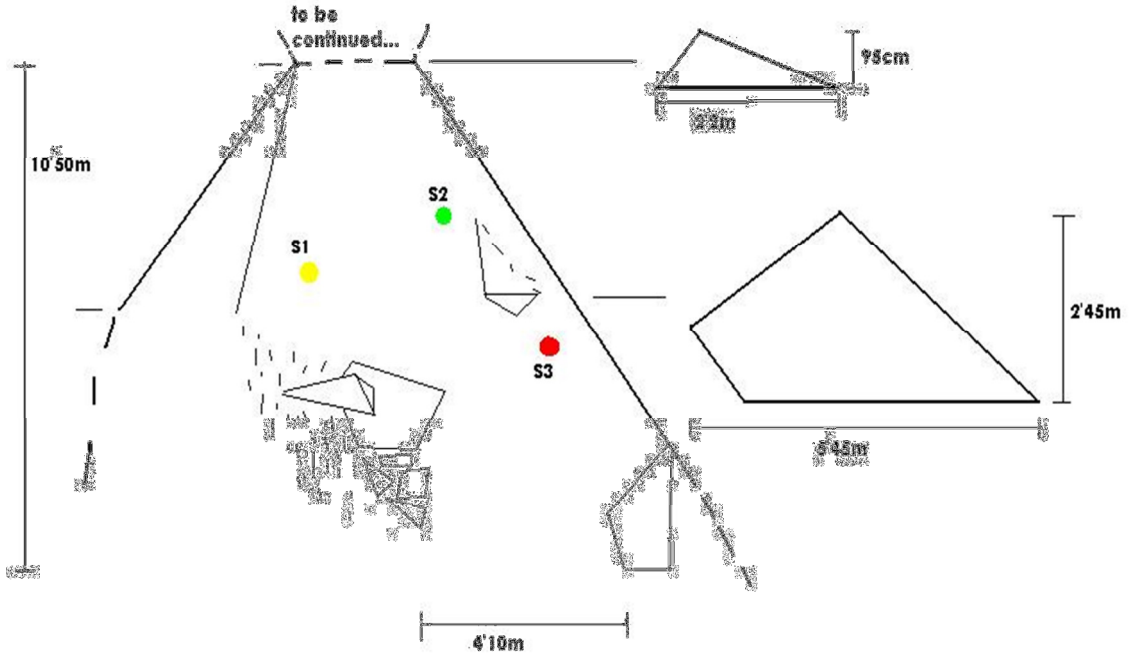
Name: POS-116						Date: 18-04-2009
Type of structure: SHELTER					GPS	NM: 5614 9994
Size:						ALTITUDE: 21M
TP	Sample	Depth	Volume (l.)	Processing results	Observations	
1	-	-	-	-	NO SEDIMENT, ONLY ROCK	
Pictures:						

Name: POS-105						Date: 18-04-2009
Type of structure: ROCK-SHELTER					GPS	NM: 5607 : 9988
Size:H.1.6M, W.2,3M, D.9,3M						ALTITUDE: 7M
						
TP	Sample	Depth in CM	Volume (l.)	Processing results	Observations	
1	1	?				

1	2	80-84	0'05	MC,C,LITH	
1	3	83-90	0'05	MC,IF,C	
1	4	110	0'2	MC,IF,C	STOP FOR ROCK
2	1	85-95	0'3	MC,IF,F,C,S	
2	2	95-105	0'2	MC,IF,F,C	STOP FOR ROCK
Description: HUGE R/S FACING? TOWARDS N. INSIDE OF INLET: WELL PROTECTED. ROCKY COASTLINE					
Pictures: SKYE'09-325					

Name: POS-106						Date:18-04-2009
Type of structure: SHELTER					GPS	NM 5608 9973
Size:						ALTITUDE: 0M
TP	Sample	Depth	Volume (l.)	Processing results	Observations	
Pictures:SKYE'09-326						

Name: POS-107						Date:18-04-2009
Type of structure: ROCK-SHELTER					GPS	NM: 5609 9976
Size: H.2'45M, W.5'45M, D.>10'5M						ALTITUDE: 0M



TP	Sample	Depth	Volume (l.)	Processing results	Observations
1	1	20CM	0'45	MC,IF,F,C	
1	2	20-30CM	0'2	MC,IF,F,C,Metal	

1	3	30-40CM	0'15	MC,IF,F,C	
1	4	40CM	0'15	MC,IF,C,S	
1	5	75-80CM	0'1	MC,IF,F,C	STOP FOR ROCK
2	1	50-60CM	0'4	MC,IF,F,C,S	STOP FOR ROCK
3	1	40-50CM	0'25	MC,IF,F,C	
3	2	50-60CM	0'5	MC,IF,F,C,S	
3	3	60-70CM	0'35	MC,IF,F,C	
3	4	70-80CM	0'25	MC,IF,F,C	
3	5	80-90CM	0'15	MC,IF,F,C	
3	6	90-100CM	0'3	MC,IF,F,C	STOP FOR ROCK

Description:
ENORMOUS R/S, HIDDEN FROM THE SEA. FACING W, BUT WITH HUGE ____ IN FRONT. EXTENDS AFTER A LOW OPENING OUTSTANDING LOCATION. TOTALLY SHELTERED.

Pictures: SKYE'09-327 and SKYE'09-328

Name: POS-108					Date: 19-04-2009
Type of structure: SHELTER				GPS	NM: 5627
					: 9959
Size:					ALTITUDE: 49M
SMALL SHELTER WITH A WALL					
TP	Sample	Depth	Volume (l.)	Processing results	Observations
Pictures: SKYE'09-329					

Name: POS-109					Date: 19-04-2009
Type of structure: CAVE				GPS	NM: 5646
					: 9962
Size: D.4-5M					ALTITUDE: 5M
CAVE WITH FALLEN ROCKS IN FRONT. INSIDE IS FULL OF WATER WITH NO POSSIBILITI TO TAKE SAMPLES					
TP	Sample	Depth	Volume (l.)	Processing results	Observations
Pictures:					

Name: POS-110					Date: 19-04-2009
Type of structure: CAVE				GPS	NM: 5651
					: 9953
Size:D.10-15M, W.4M, H.10M					ALTITUDE: 2M

BIG CAVE FULL WITH RUBBISH AND STONES. THERE'S NO SEDIMENT.					
TP	Sample	Depth	Volume (l.)	Processing results	Observations
Pictures:					

Name: POS-111					Date: 19-04-2009
Type of structure: CAVE/SHELTER				GPS	NM: 56591
					: 99630
Size:D.2M, H.2M, W.1'5M					ALTITUDE: 4M
THE FLOOR IS COVERED OF SAND AND SHELLS. IT'S IMPOSSIBLE TO GET A SAMPLE, BECAUSE THE SEDIMENT WON'T GET					
TP	Sample	Depth	Volume (l.)	Processing results	Observations
Pictures:ORIOL					

Name: POS-112					Date:
Type of structure: CAVE/SHELTER				GPS	NM: 5660
					: 9969
Size: D.1M, W.0'5M, H.2M					ALTITUDE: 5M
FULL OF FALLEN ROCKS IN FRONT OF THE CAVE (ALMOST 15M)					
TP	Sample	Depth	Volume (l.)	Processing results	Observations
Pictures:					

Name: POS-113					Date: 18-04-2009
Type of structure: CAVE				GPS	NM: 5703
					: 9964
Size: W.3M, H.1M, D.1'5M					ALTITUDE: 8M
INSIDE IS FULL OF RUBBISH, AND STONE. ALMOST NO SEDIMENT					
TP	Sample	Depth	Volume (l.)	Processing results	Observations
Pictures:					

Name: POS-114					Date: 18-04-2009
Type of structure:				GPS	NM: 57101
					: 99531
Size: W.1'5M, D.2M, H.1M					ALTITUDE: 7M
FLOOR WITH STANDING WATER, MOSSLGRASS.					
TP	Sample	Depth	Volume (l.)	Processing results	Observations
1	-	<30CM	-	-	STOP FOR ROCK

2	-	<30CM	-	-	STOP FOR ROCK
3	-	<30CM	-	-	STOP FOR ROCK
Pictures:					

Name: POS-115					Date: 19-04-2009
Type of structure: CAVE/SHELTER				GPS	NM: 56988 : 99713
Size:W.2M, D.10M, H,2-3M.					ALTITUDE: 7M
THERE EXIST FRONT AND BACK ENTRANCE. THE FLOOR IS COVERED BY FALLEN ROCKS, SO THERE'S NO POSSIBILITY TO TAKE SAMPLES					
TP	Sample	Depth	Volume (l.)	Processing results	Observations
Pictures:					

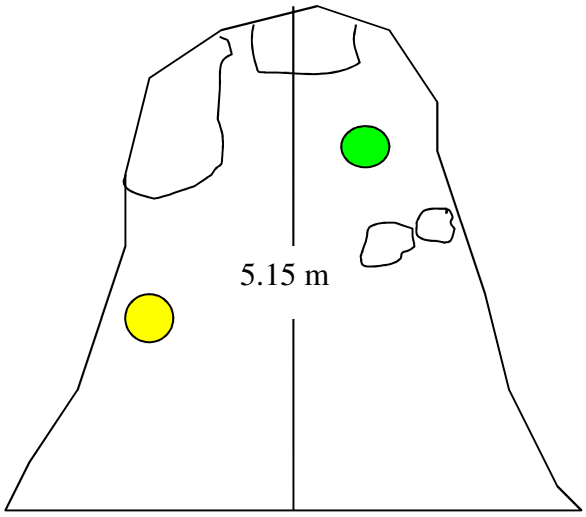
Name: POS-031					Date: 17-04-2009
Type of structure: ROCKSHELTER				GPS	NM: 56170 : 99855
Size:					ALTITUDE:
ROCKSHELTER WITH DEEP SOILS. NO SHELLS IN SURFACE					
TP	Sample	Depth	Volume (l.)	Processing results	Observations
Pictures: SKYE'09-138					

Name: POS-032					Date: 17-04-2009
Type of structure: ROCKSHELTER				GPS	NG: 56225 BNG: 99500
Size:					ALTITUDE: 28M
NO SOIL LEFT UNDER COVER HUT					
TP	Sample	Depth	Volume (l.)	Processing results	Observations
Pictures: SKYE'09-139					

Name: POS-033					Date: 17-04-2009
Type of structure: ROCKSHELTER				GPS	NM: 56261 : 99365
Size:					ALTITUDE: 8M
VERY WET INSIDE NO SIGNS OF SHELLS					

TP	Sample	Depth	Volume (l.)	Processing results	Observations
Pictures: SKYE'09-140					

Name: RFG-01		Date: 14/15-04-2009
Type of structure: SHELTER	GPS	NG:5861
		: 4291
Size: W.4'15M, D.5'15M		ALTITUDE: -



S1: muestras de carbón-conchas- pelo. Encontradas a 20 cm de profundidad.

En lo casos en los que no podía realizarse un sondeo con *auger* se optó por realizarlo de manera inclinada.

Alcanzamos los 0,70 cm con un sondeo en diagonal.

Hacia el norte de la roca hay una apertura que presenta mucho derrumbe, se intenta muestrear pero es muy estrecho y está muy húmedo, por lo que se dificulta realizar el sondeo , también tiene muchas rocas de derrumbe que tapan la abertura.

Oriol sondeó en el sector casi inaccesible de la cueva/alero N del mismo conjunto rocoso.

Perfil del sondeo

Superficie: excremento de oveja	20 cm
Arena	
Línea de conchillas	2 cm
Carbones y lapas	30 cm

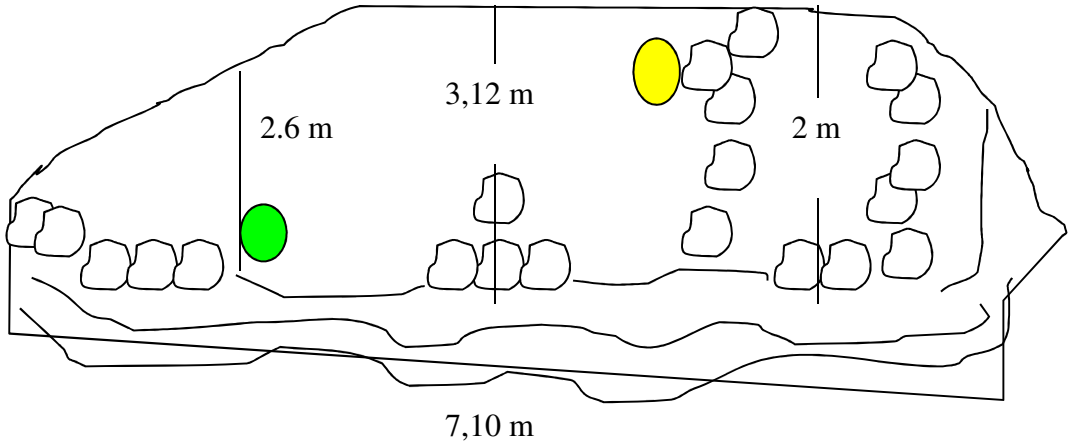
S2: este sondeó en la parte interior del alero no dio resultados y no se tomaron muestras.

TP	Sample	Depth	Volume (l.)	Processing results	Observations
1	1	70CM	0'3	MC,IF,F,C	CHARCOAL, SHELLS, HAIR
1	2	20-30CM	0'35	MC,IF,C	
2	-	?	-	-	NO RESULTS

Soil description: 0-20CM- SHEEP DUNG AND SAND 20-22CM- SHELLS 22-52CM- CHARCOAL AND SHELLS
Pictures: from SKYE'09-029 to SKYE'09-032, and from SKYE'09-296 to SKYE'09-298

Name: RFG-02		Date: 14/15-04-2009
Type of structure: SHELTER	GPS	NG: 5861
		BNG: 4290
Size:W.7'10M, D.3'12M		ALTITUDE:

Sondeo inclinado



TP	Sample	Depth	Volume (l.)	Processing results	Observations
1	1A	15CM	0'4	MC,IF,C	WITH TROWEL
2	1	0CM	<0'01	C	CHARCOAL
2	4	50CM	0'02	MC	

Soil description:

SURFACE, BLACK SOIL	0-20/25 cm
WHITE SAND	25-30 cm
BROWN SAND	30-43 cm
SHELLS	43 cm

S1: gran concentración de lapas. Se tomaron muestras de lapas. No pudo profundizar el sondeo, se llegó hasta los 25 cm de profundidad. No se usó el auger, porque el techo se encuentra a muy bajo nivel y no entran por la altura las herramientas.

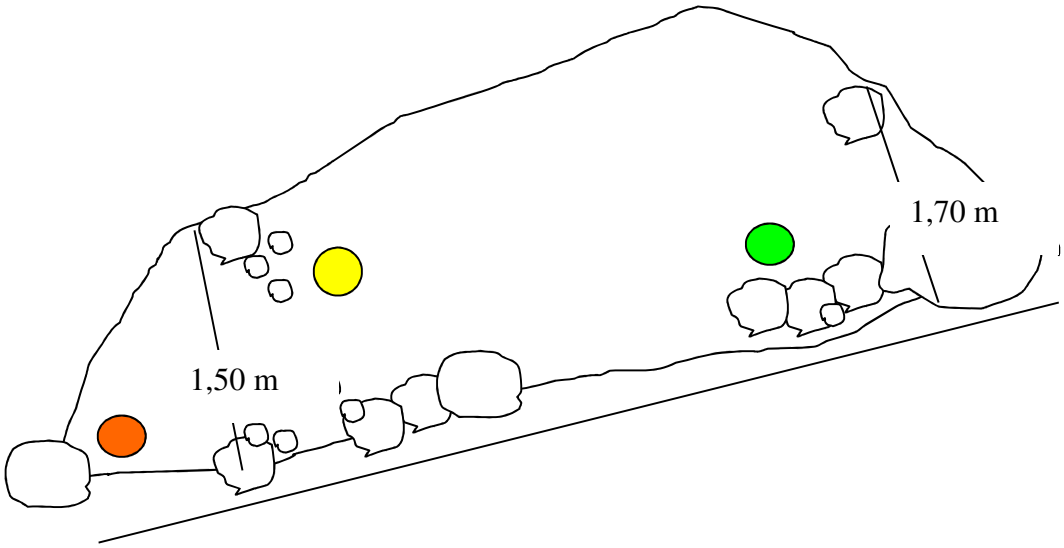
S2: sondeo en la entrada del alero. Se utilizó el auger, también se muestreó carbón en primer nivel y entre los 20 y 25 cm hay cambio de sedimento (arena blanca). A los 30 cm apareció otro cambio de sedimento, continúa siendo arenoso pero de color marrón oscuro.

Perfil del sondeo

Nivel superficial con sedimento color negro	0 a 20-25 cm
Arena blanca	25 a 30 cm
Arena marrón	30 a 43 cm
lapas	43 cm

Pictures: SKYE'09-035 and SKYE'09-036, and SKYE'09-301

Name: RFG-03		Date: 14/15-04-2009
Type of structure: ROCKSHELTER	GPS	NG: 5862
		BNG: 4288
Size: D.1'7M, W.3'34M		ALTITUDE:



Sondeo inclinado, extracción en diagonal

S1: se obtuvo carbón a 15 cm de profundidad

S2: no salió nada

S3: muestra de carbón entre los 0,40 cm y los 0,50 cm. Muestra de carbón a 0,60 cm.

Finaliza el sondeo no se puede profundizar más

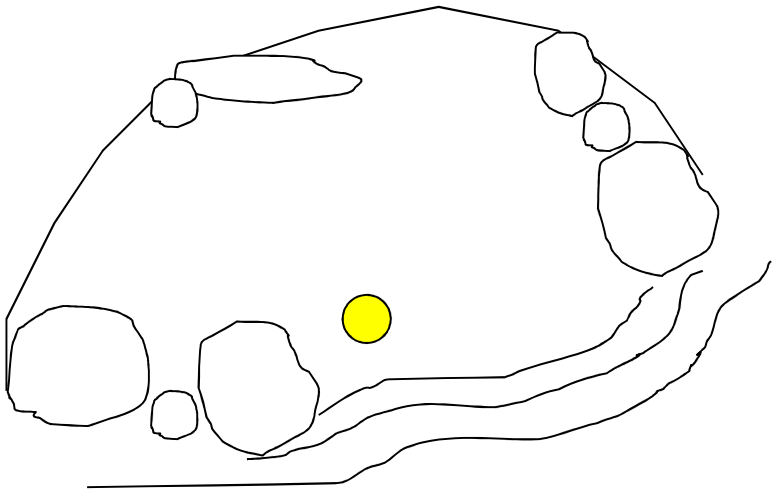
TP	Sample	Depth	Volume (l.)	Processing results	Observations
1	1	15CM	0'01		CHARCOAL
2	-	?	-	-	
3	2	40-50CM	0'01	C	
3	3	50CM	0'01	C	

Pictures: SKYE'09-037 and SKYE'09-038

Name: RFG-04		Date: 14/15-04-2009
Type of structure: ROCKSHELTER	GPS	NG: 5864
		BNG: 4287
Size:		ALTITUDE: 8

S1: se encontró carbón y lapas a 10 cm de profundidad

Detrás del sondeo hay una piedra quemada y la base del techo del alero también aparece quemada.

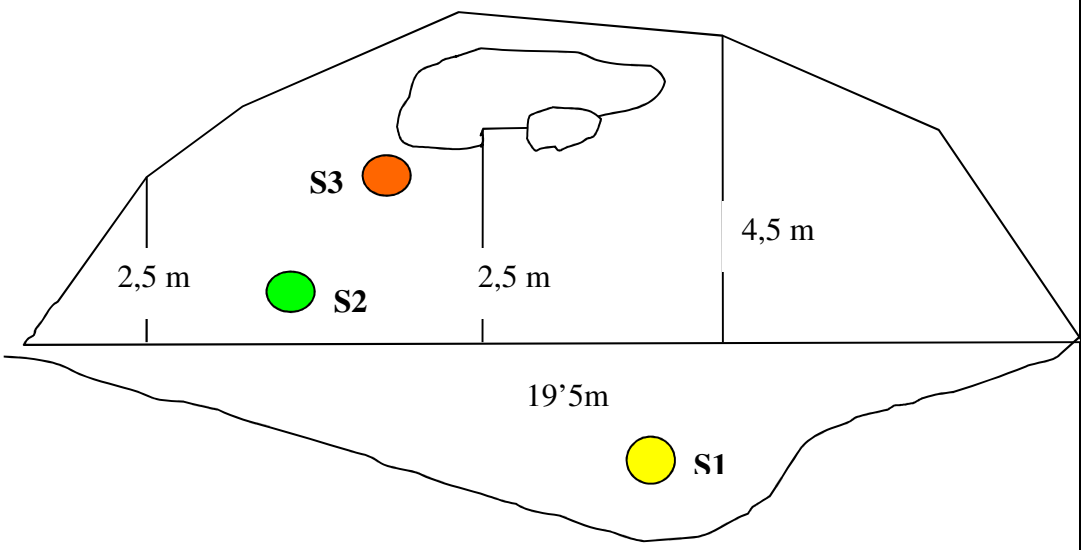


TP	Sample	Depth	Volume (l.)	Processing results	Observations
1	-	?	-		CHARCOAL AND SHELLS 10CM DEEP

Soil description:
BEYOND THE TP THERE IS A BURNED STONE

Pictures: from SKYE'09-039 to SKYE'09-041

Name: RFG-05		Date: 14/15-04-2009
Type of structure: ROCKSHELTER	GPS	NG: 5864
		BNG: 4282
Size:W.19'5M, D.4'5M		ALTITUDE:



S1: sondeo realizado fuera del alero, antes del comienzo de la pendiente. En los primeros niveles el sedimento es negro y muy compacto. Entre los 50 cm y el metro de profundidad apareció un conchero.

Se tomaron tres muestras:

0,50-0,90 m

0,90-1m

1 -1,10 m

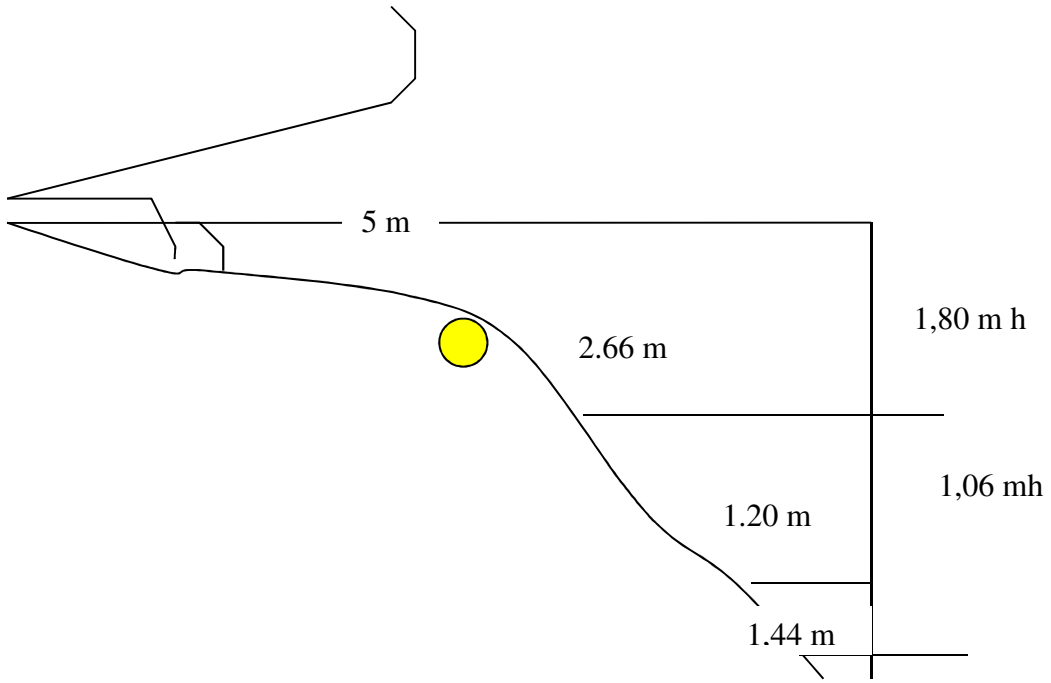
S2: Oriol realizó un sondeo alcanzando los 0,70 m pero sin obtener muestras, Sólo aparecieron lapas a nivel superficial en ese sector de la cueva.

S3: a 2,70 m de la línea de medición hacia el norte se tomaron 8 muestras.

TP	Sample	Depth	Volume (l.)	Processing results	Observations
1	-	0-80CM	-	-	BLACK AND COMPACTED SOIL
1	1	80-90CM	0’25	MC,IF,F,C	
1	2	90-100CM	0’3	MC,IF,F,C,S,P	
1	3	100-110 CM	0’3	MC,IF,F,C,S	
2	1	35-45CM	0’6	MC,IF,F,C,S,P	
2	2	45-55CM	0’35	MC,IF,C	

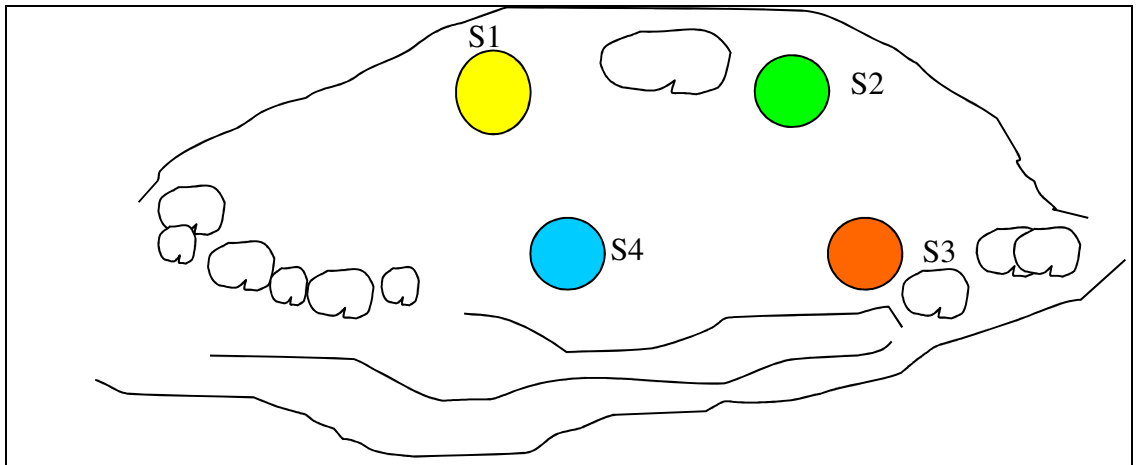
2	3	70	0’4	MC,IF,C	
3	1	10-20CM	0’2	MC,IF,F,C	
3	2	20-30CM	0’01	MC,C	
3	3	30-40CM	0’4	MC,IF,C,P	
3	4	40-50CM	0’45	MC,IF,F,C	
3	5	50-60CM	0’45	MC,IF,F,C,S,P	
3	6	60-70CM	0’4	MC,IF,F,C,S	
3	7	70-80CM	0’35	MC,IF,F,C	
3	8	80-90CM	0’35	MC,IF,F,C,S	

Profile:



Pictures: SKYE’09-044 and SKYE’09-045

Name: RFG-06		Date: 14/15-04-2009
Type of structure: ROCKSHELTER	GPS	NG:
		BNG:
Size:		ALTITUDE:



TP	Sample	Depth	Volume (l.)	Processing results	Observations
1	1	<15CM			WITH TROWEL, SHELL ON SURFACE
2	1	<15CM			SHELL 15CM DEEP
3	-	30CM	-	-	
4	1	25CM			NARROW LEVEL OF SHELLS

S1: lapa con una perforación en el centro con posibles marcas. El sondeo se hizo con maletín.

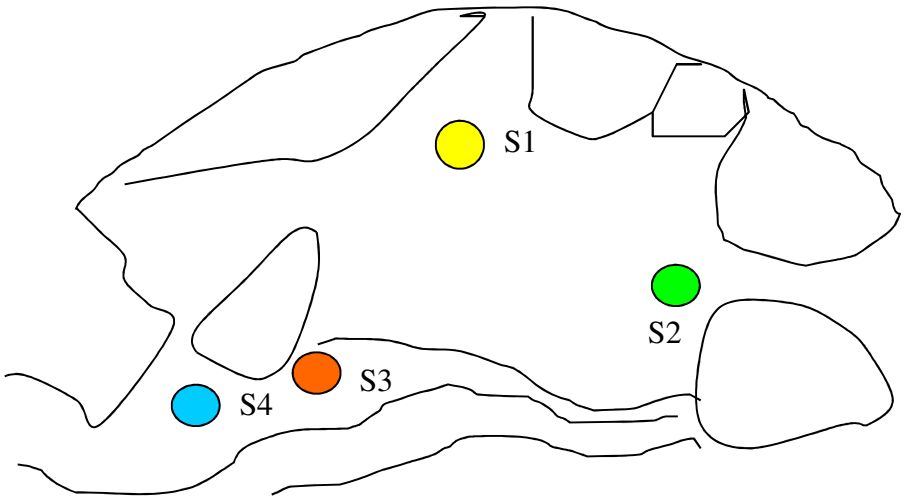
S2: se registró solo un caracol a 15 cm de profundidad

S3: este sondeo se realizó con auger. Se tomaron para muestras carbones entre 5 y 10 cm, y a los 30 cm se obtuvo un caracol.

S4: sondeo con auger, entre los 20 y 25 cm de profundidad se encontró un nivel muy fino de caracoles

Pictures: SKYE'09-046 and SKYE'09-047

Name: RFG-07		Date: 14/15-04-2009
Type of structure: ROCKSHELTER	GPS	NG: 5864
		BNG: 4285
Size:		ALTITUDE:



TP	Sample	Depth	Volume (l.)	Processing results	Observations
1	-	<80CM	-	-	
2	-	<80CM	-	-	
3	-	<80CM	-	-	
4	-	<80CM	-	-	
Soil description: SHELLS ON THE SURFACE					
Pictures:SKYE'09-048					

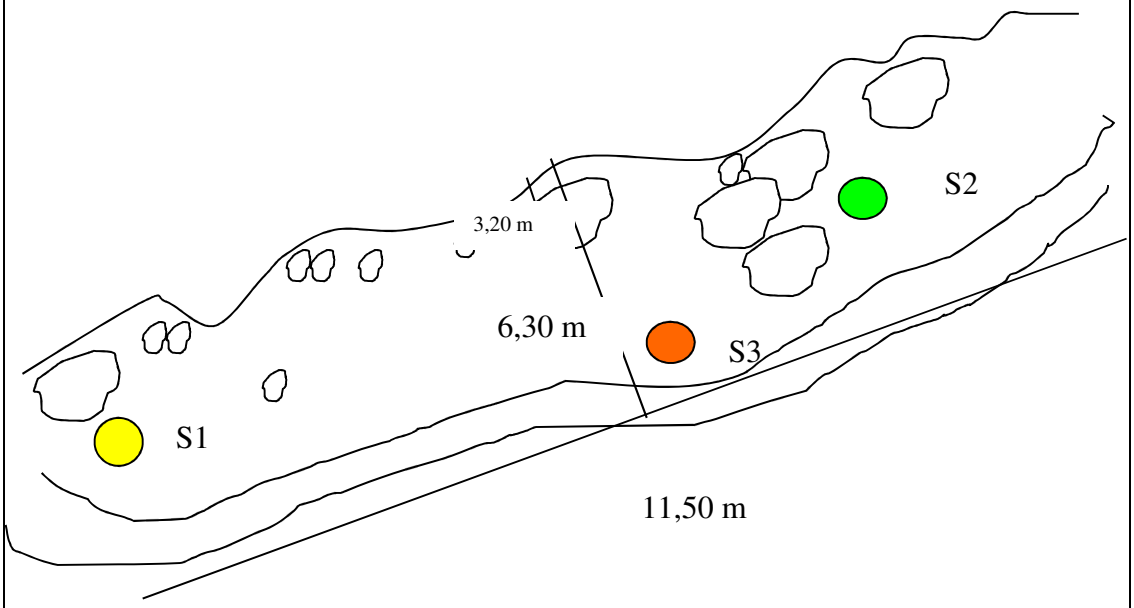
Name: RFG-08		Date: 14/15-04-2009
Type of structure: ROCKSHELTER	GPS	NG: 5052
		BNG: 4281
Size:W.11'50M, D.5'3M		ALTITUDE:

A 6,30 metros comienza la pendiente del alero. La altura que alcanza el techo del alero es de 6,20 m.

S1: 0-110 cm: didn't reach bedrock

S2: Se tomaron dos muestras una 35-53 cm y otra entre los 90 y 100 cm.

S3: no se tomaron muestras.



TP	Sample	Depth	Volume (l.)	Processing results	Observations
1	-	110CM			DIDN'T REACH BEDROCK
2	1	35-53CM	0'35	NOTHING	
2	2	90-100CM	-		
3	-	-	-		

Soil description:

SP1

0-5cm	Sheep Poo
5-15cm	Brown loose organic silt, roots present
15-20cm	Grey firm mineralogenic clay
20-25cm	(Query?) Brown loose organic silt (possibly fall from side of bore hole)
25-40cm	Grey firm mineralogenic clay, rare gravel present. Increase in firmness down profile to very firm at 40cm.
40-110cm	Grey firm mineralogenic clay, no gravel present. Decrease in firmness down profile to loose. Bottom of deposits not reached. Sample 1 taken at 100-110cm

SP2

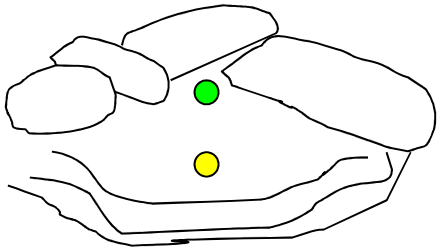
0-30cm	Brown loose organic silt
30-70cm Grey firm mineralogenic clay, occasional gravel present.	
70-110cm	Grey firm mineralogenic clay, occasional gravel present. Decrease in firmness to loose, increase in organic content down profile – increase in brown hughe. Bottom deposits not reached. Sample 1: ~35-53cm. Sample 2: 90-100cm

Pictures: from SKYE'09-053 to SKYE'09-057, and SKYE'09-307

Name: RFG-09		Date: 14/15-04-2009
Type of structure: ROCKSHELTER	GPS	NG: 5859
		BNG: 4281
Size:		ALTITUDE:

Se realizaron dos sondeos S1, S2; no se encontró nada, tampoco a nivel a superficial.

El alero queda al lado del 010.

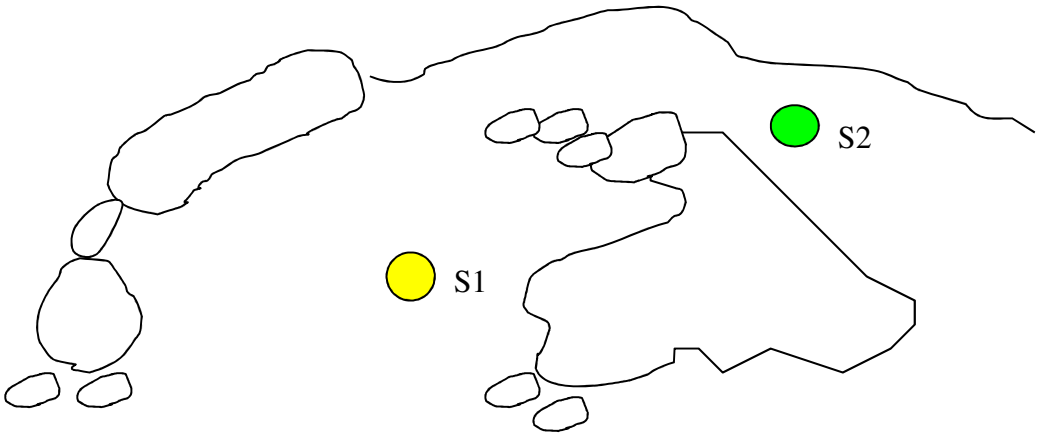


TP	Sample	Depth	Volume (l.)	Processing results	Observations
1	-	?	-	-	NOTHING
2	-	?	-	-	NOTHING

Soil description:

Pictures: SKYE'09-058 and SKYE'09-059

Name: RFG-10		Date: 14/15-04-2009
Type of structure: ROCKSHELTER	GPS	NG:5858
		BNG: 4281
Size:		ALTITUDE: 38



TP	Sample	Depth	Volume (l.)	Processing results	Observations
1	1	35CM			SANDY SOIL WITH CHARCOAL
1	2	35-40CM	0'05	MC,IF	
1	3	40-60CM	0'3	C	BEDROCK AT THE END
2	-	?	-	-	NOTHING

S1: a los 0,35 m sedimento arenoso. Entre los 0,35 cm y los 0,60 cm carbones y fragmentos de lapas. A partir de los 0,60 cm roca madre.

Muestras 1: 2 carbones, 35 cm

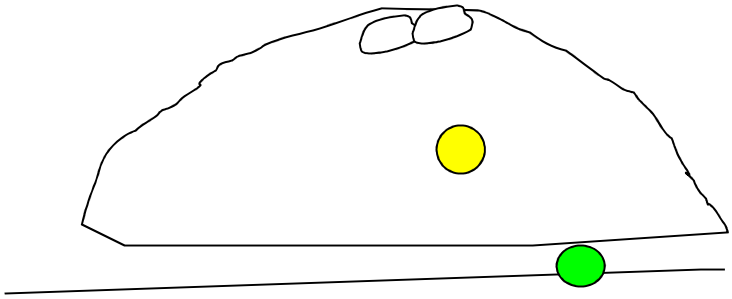
Muestras 2: entre 35 y 40 cm

Muestra 3: entre 40 y 60 cm

S2: no se obtuvo nada

Pictures:SKYE'09-060 and SKYE'09-061

Name: RFG-11		Date: 14/15-04-2009
Type of structure: ROCKSHELTER	GPS	NG: 5852
		BNG: 4281
Size:W.2'75M		ALTITUDE:



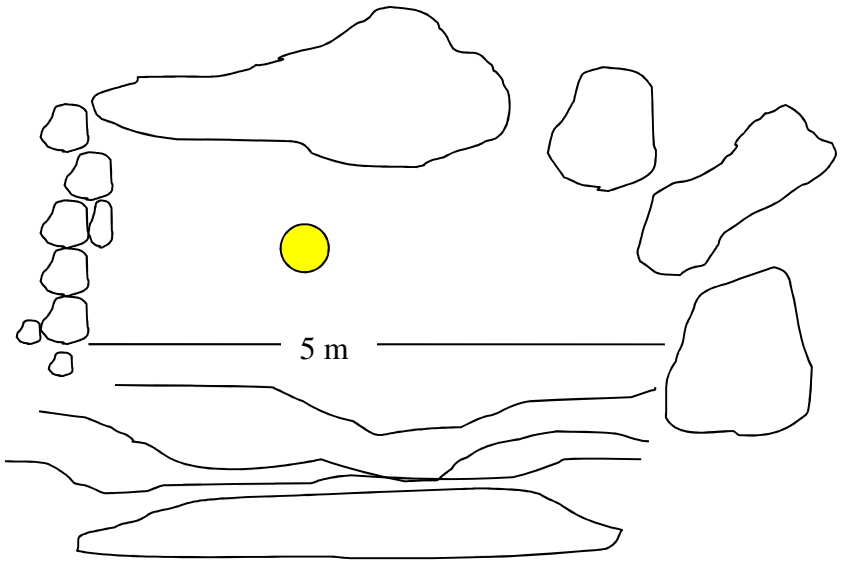
2,75 m

S1: 20 cm de profundidad no apareció nada. Sedimento arenoso, se alcanzó la roca madre.

S2: 42 cm de profundidad. Se llegó a la roca madre y solo se registró sedimento arenoso.

TP	Sample	Depth	Volume (l.)	Processing results	Observations
1	-	20CM	-	-	BEDROCK
2	-	42CM	-	-	BEDROCK
Pictures:SKYE'09-062 and SKYE'09-063					

Name: RFG-12		Date: 14/15-04-2009
Type of structure: ROCKSHELTER	GPS	NG: 5855
		BNG: 4287
Size:ROCKSHELTER		ALTITUDE:



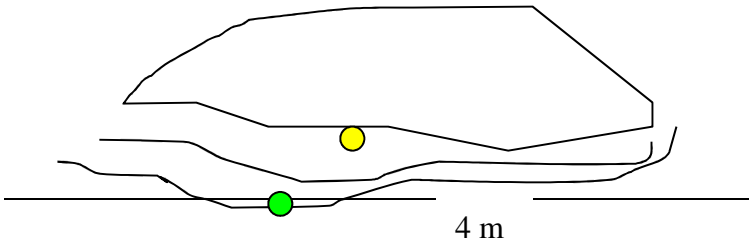
TP	Sample	Depth	Volume (l.)	Processing results	Observations
1	-	20CM	-	-	BEDROCK

Soil description:

S1: A 20 cm se llegó a la roca madre, el sedimento es gray louse sandy silt. No se tomaron muestras

Pictures:SKYE'09-064 and SKYE'09-065

Name: RFG-13		Date: 14/15-04-2009
Type of structure: ROCKSHELTER	GPS	NG: 5853
		BNG: 4291
Size:W.4M		ALTITUDE:



S1: sedimento orange loose sand, a 45 cm sedimento orange brown loose organic sand.

S2: a 10 cm, brown loose organic sand/Mass.

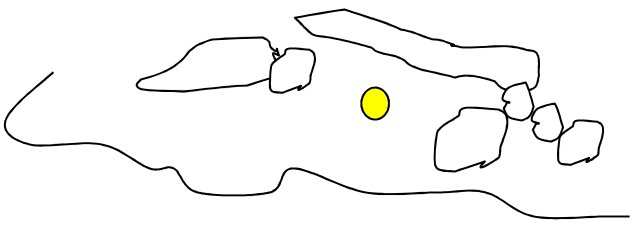
No se tomaron muestras.

TP	Sample	Depth	Volume (l.)	Processing results	Observations
1	-	45CM	-	-	NOTHING
2	-	10CM	-	-	NOTHING

Soil description:

Pictures:SKYE'09-066 and SKYE'09-067

Name: RFG-14		Date: 14/15-04-2009
Type of structure: ROCKSHELTER	GPS	NG: 5855
		BNG: 4286
Size:		ALTITUDE:



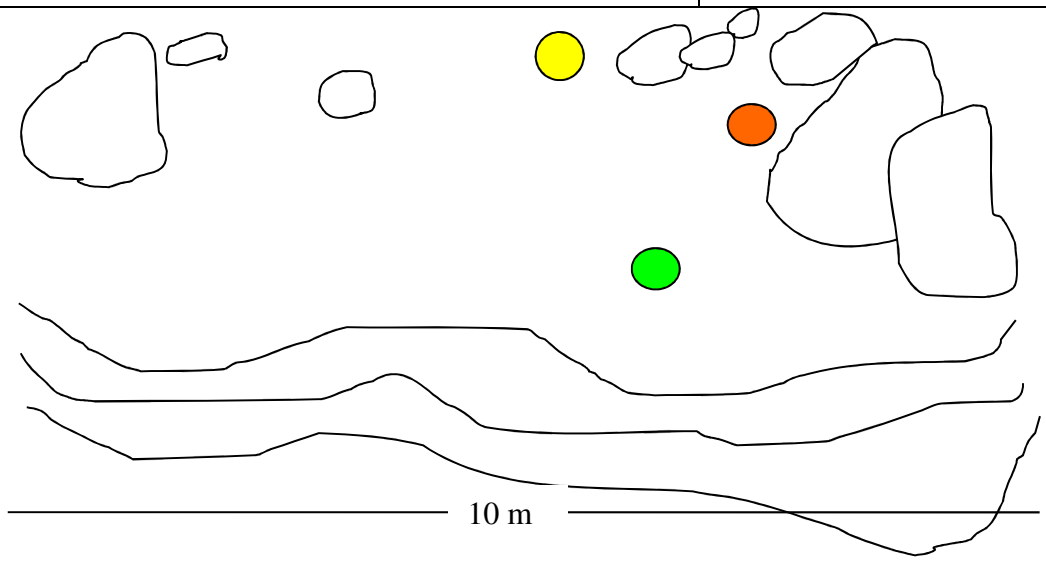
TP	Sample	Depth	Volume (l.)	Processing results	Observations

1	-	?	-	-	NOTHING

Soil description:
Sin resultados solo se realizó un solo sondeo S1: sin resultados.

Pictures:SKYE'09-071 and SKYE'09-072

Name: RFG-15		Date: 14/15-04-2009
Type of structure: ROCKSHELTER	GPS	NG: 5854
		BNG: 4288
Size:		ALTITUDE:

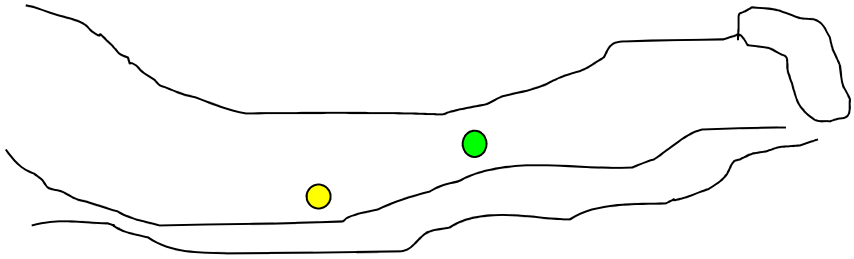


TP	Sample	Depth	Volume (l.)	Processing results	Observations
1	-	?	-	-	NOTHING
2	-	?	-	-	NOTHING
3	-	?	-	-	NOTHING

Se hicieron tres S1, S2 y S3, sondeos pero no se encontró nada y no se tomaron muestras.

Pictures:SKYE'09-074 and SKYE'09-075

Name: RFG-16		Date: 14/15-04-2009
Type of structure: SHELTER	GPS	NG: 5848
		BNG: 4288
Size:		ALTITUDE:

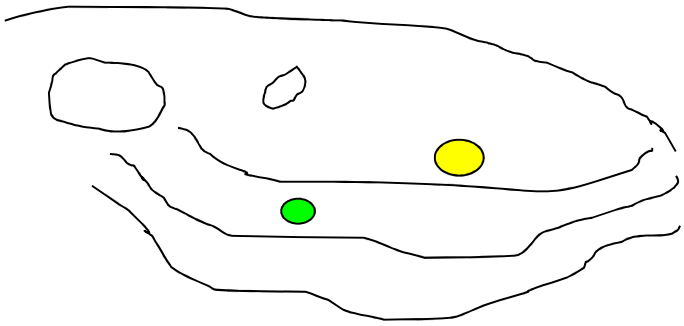


TP	Sample	Depth	Volume (l.)	Processing results	Observations
1	-	<10CM	-	-	BEDROCK
2	-	<10CM	-	-	BEDROCK

Soil description:
THE SOIL IS BROWN SOFT ORGANIC SILT

Pictures:SKYE'09-76 and SKYE'09-77

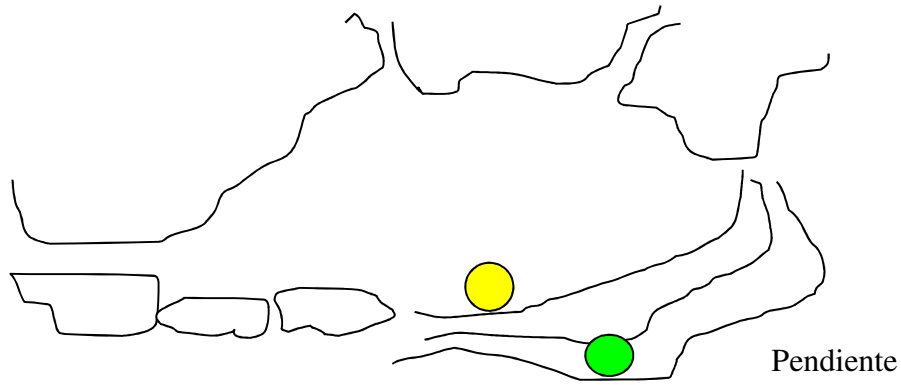
Name: RFG-17		Date: 14/15-04-2009
Type of structure: SHELTER	GPS	NG: 5859
		BNG: 4288
Size:		ALTITUDE: 46



TP	Sample	Depth	Volume (l.)	Processing results	Observations
1	-	10CM	-	-	BEDROCK

2	-	25C M	-	-	BEDROCK
Pictures:SKYE'09-78 and SKYE'09-79					

Name: RFG-18		Date: 14/15-04-2009
Type of structure: SHELTER	GPS	NG: 5858
		BNG: 4286
Size:		ALTITUDE: 18



TP	Sample	Depth	Volume (l.)	Processing results	Observations
1	-	20CM	-	-	WITH TROWEL
2	-	?	-	-	

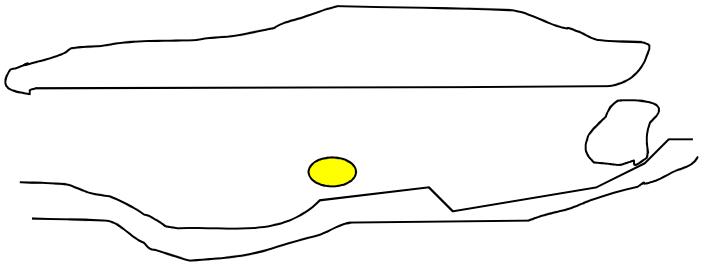
Soil description:

S1: se alcanzaron los 20 cm no encontrando nada. El sedimento es orgánico d color negro.

S2: a un nivel más bajo se sondearon 50 cm y nos volvimos a encontrar con una muralla de piedra. El sondeo no dio resultados. A 10 cm apareció un nivel negro de tierra. Se tomó muestras del sedimento.

Pictures: from SKYE'09-83 to SKYE'09-89

Name: RFG-19		Date: 14/15-04-2009
Type of structure: SHELTER	GPS	NG: 5857
		BNG: 4289
Size:		ALTITUDE:



TP	Sample	Depth	Volume (l.)	Processing results	Observations
1	-	60CM	-	-	-

Soil description:
THE SOIL IS BROWN HARD SANDY SILT, ORGANIC YELLOW SAND STINE AT BASE

Pictures:SKYE'09-97 and SKYE'09-98

Name: RFG-20		Date: 14/15-04-2009
Type of structure: SHELTER	GPS	NG:
		BNG:
Size:		ALTITUDE:

VERY SMALL SHELTER WITH PLENTY SHELLS ON THE SURFACE

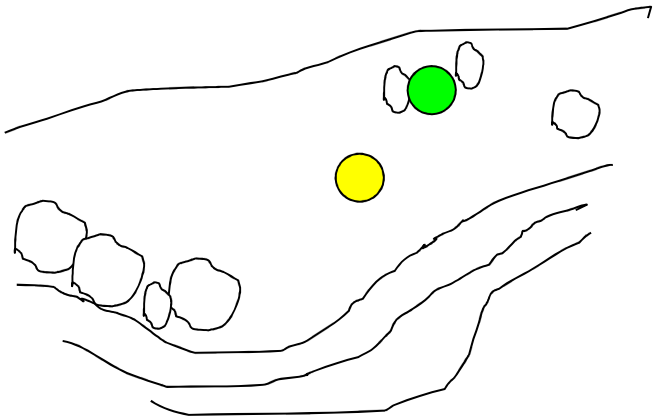
BY THE SIDE OF RFG-02

TP	Sample	Depth	Volume (l.)	Processing results	Observations
1	1	5CM	0'05	MC,C	BEDROCK
1	2	5-10CM	0'1	MC,IF,C	
2	-	15CM	-	-	

Soil description:

Pictures:SKYE'09-91 and SKYE'09-92

Name: RFG-21		Date: 14/15-04-2009
Type of structure: SHELTER	GPS	NG: 5860
		BNG: 4288
Size:		ALTITUDE: 21M



TP	Sample	Depth	Volume (l.)	Processing results	Observations
1	-	25CM	-	-	BEDROCK
2	1	10-15CM	0'03	MC	

Soil description:

S1: no se encontró nada, alcanzando los 25 cm.

S2: entre 10 y 15 cm apareció carbón y lapas, se tomó una muestra.

Pictures:SKYE'09-94 and SKYE'09-95

Appendix 2. List of samples, survey sites.

Ferran Antolin.

Soil samples were taken from all the sites that showed a good potentiality of being shell middens. Five locations were sampled and a total of 21,925 litres soil were processed. Every soil sample taken was water-sieved (either with one mesh of 3 mm or with two meshes of 5 and 3 mm) after measuring its volume in litres. Measuring volume has been the best option, not only because weight can be affected by soil humidity or presence/lack of stones, but also because it was more adequate when samples were processed in the field.

SITE	ROCK-	HOLE	SAMPL	DEP	VOLUME	5 mm	3 mm

	SHELTER		E	TH	(l.)		
Raasay-Fairy Glen	1	SP1	1	70 cm	0,3	malacofauna, charcoal	charcoal, ictiofauna, fauna
Raasay-Fairy Glen	1		2	20-30 cm	0,35	charcoal, malacofauna	malacofauna, charcoal, ictiofauna
Raasay-Fairy Glen	2	SP1	1a	15 cm	0,4	-	charcoal, ictiofauna, fauna, malacofauna
Raasay-Fairy Glen	2	SP2	4	50 cm	0,02	-	malacofauna
Raasay-Fairy Glen	3	SP3	2	40-50 cm	0,01	-	charcoal
Raasay-Fairy Glen	3	SP3	3	50 cm	0,01	-	charcoal
Raasay-Fairy Glen	5	SP1	1	80-90 cm	0,25	malacofauna, fauna, ictiofauna, charcoal	charcoal, malacofauna, ictiofauna
Raasay-Fairy Glen	5	SP1	2	90-100 cm	0,3	malacofauna, pottery, ictiofauna, fauna	charcoal, seeds, malacofauna, ictiofauna
Raasay-Fairy Glen	5	SP1	3	100-110 cm	0,3	malacofauna, charcoal, ictiofauna	charcoal, seeds, malacofauna, ictiofauna, fauna
Raasay-Fairy Glen	5	SP2	1	35-45 cm	0,6	charcoal, pottery, malacofauna, ictiofauna	ictiofauna, fauna, malacofauna, seeds
Raasay-Fairy Glen	5	SP2	2	45-55 cm	0,35	charcoal, malacofauna, ictiofauna	ictiofauna, malacofauna, charcoal
Raasay-Fairy Glen	5	SP2	3	70 cm	0,4	ictiofauna, malacofauna	charcoal, ictiofauna, malacofauna
Raasay-Fairy Glen	5	SP3	1	10-20 cm	0,2	malacofauna, ictiofauna, fauna	malacofauna, charcoal, ictiofauna
Raasay-	5	SP3	2	20-30	0,01	charcoal,	charcoal

Fairy Glen				cm		malacofauna	
Raasay-Fairy Glen	5	SP3	3	30-40 cm	0,4	malacofauna, pottery	charcoal, ictiofauna, malacofauna
Raasay-Fairy Glen	5	SP3	4	40-50 cm	0,45	malacofauna, charcoal, ictiofauna, fauna	ictiofauna, fauna, malacofauna, charcoal
Raasay-Fairy Glen	5	SP3	5	50-60 cm	0,4	charcoal, pottery, malacofauna, ictiofauna	fauna, charcoal, ictiofauna, malacofauna, seeds
Raasay-Fairy Glen	5	SP3	6	60-70 cm	0,4	fauna, charcoal, ictiofauna, malacofauna, seeds	malacofauna, ictiofauna, fauna, charcoal
Raasay-Fairy Glen	5	SP3	7	70-80 cm	0,35	charcoal, malacofauna, fauna	malacofauna, fauna, charcoal, ictiofauna
Raasay-Fairy Glen	5	SP3	8	80-90 cm	0,35	malacofauna, fauna	fauna, charcoal, ictiofauna, malacofauna, seeds
Raasay-Fairy Glen	8	SP2	1	35-53 cm	0,35	-	-
Raasay-Fairy Glen	10	SP1	2	35-40 cm	0'05	-	malacofauna, ictiofauna
Raasay-Fairy Glen	10	SP1	3	40-60 cm	0,3	-	charcoal
Raasay-Fairy Glen	20	SP1	1	0-5 cm	0,05	malacofauna	charcoal
Raasay-Fairy Glen	20	SP1	2	5-10 cm	0,1	-	malacofauna, charcoal, ictiofauna
Raasay-Fairy Glen	21	SP2	1		0,03	-	malacofauna
Point of Sleat	1	SP1	1	30-40 cm	0,25	-	malacofauna, charcoal
Point of	1	SP1	2	40-60	0,18	-	malacofauna, charcoal,

Sleat				cm			ictiofauna
Point of Sleat	1	SP1	3	40-60 cm	0,33	-	malacofauna, charcoal, fauna
Point of Sleat	1	SP1	4	68-62 cm	0,31	-	malacofauna, fauna, charcoal
Point of Sleat	1	SP1	5	60-63 cm	0,43	-	malacofauna, ictiofauna, charcoal
Point of Sleat	1	SP1	6	63-78 cm	0,31	-	malacofauna, charcoal
Point of Sleat	1	SP3	1	30-40 cm	0,37	-	malaofauna, charcoal, ictiofauna
Point of Sleat	1	SP3	2	40-45 cm	0,5	-	malacofauna, ictiofauna, charcoal, fauna
Point of Sleat	1	SP4	1	0-20 cm	0,25	-	malacofauna, charcoal
Point of Sleat	1	SP4	2	20-25 cm	0,31	-	malacofauna
Point of Sleat	6	SP1	1	0-10 cm	0,2	-	charcoal
Point of Sleat	105	SP1	2	80-84 cm	0,05	-	charcoal, malacofauna, lithics
Point of Sleat	105	SP1	3	83-90 cm	0,05	-	charcoal, ictiofauna, malacofauna
Point of Sleat	105	SP1	4	110 cm	0,2	-	charcoal, ictiofauna, malacofauna
Point of Sleat	105	SP2	1	85-95 cm	0,3	-	malacofauna, ictiofauna, fauna, charcoal, seeds
Point of Sleat	105	SP2	2	95-105 cm	0,2	-	malacofauna, charcoal, ictiofauna, fauna
Point of Sleat	107	SP1	1	20 cm	0,45	-	malacofauna, charcoal, ictiofauna, fauna
Point of Sleat	107	SP1	2	20-30 cm	0,2	-	metal, malacofauna, ictiofauna, fauna,

							charcoal
Point of Sleat	107	SP1	3	30-40 cm	0,15	-	malacofauna, charcoal, ictiofauna, fauna
Point of Sleat	107	SP1	4	40 cm	0,15	-	malacofauna, ictiofauna, charcoal, seeds
Point of Sleat	107	SP1	5	75-80 cm	0,1	-	malacofauna, charcoal, ictiofauna, fauna
Point of Sleat	107	SP2	1	50-60 cm	0,4	-	charcoal, seeds, ictiofauna, fauna, malacofauna
Point of Sleat	107	SP3	1	40-50 cm	0,25	-	malacofauna, charcoal, ictiofauna, fauna
Point of Sleat	107	SP3	2	50-60 cm	0,5	-	charcoal, seeds, ictiofauna, fauna, malacofauna
Point of Sleat	107	SP3	3	60-70 cm	0,35	-	malacofauna, charcoal, ictiofauna, fauna
Point of Sleat	107	SP3	4	70-80 cm	0,25	-	malacofauna, charcoal, ictiofauna, fauna
Point of Sleat	107	SP3	5	80-90 cm	0,15	-	malacofauna, charcoal, ictiofauna, fauna
Point of Sleat	107	SP3	6	90-100 cm	0,3	-	malacofauna, charcoal, ictiofauna, fauna
Dunan	Martin's Midden	SP1	1	45-50 cm	0,15	-	malacofauna, charcoal
Dunan	Martin's Midden	SP1	1	30-40 cm	0,2	-	malacofauna, charcoal
Glenelg	NG 79618/B NG 22155			0-10 cm	0,01	-	malacofauna
Ashaig	NG 68721/B	SP1	1	10-20 cm	0,4	-	malacofauna, lithics

	NG 24268						
Ashaig	NG 68721/B NG 24268	SP1	2	20-30 cm	0,25	-	malacofauna
Ashaig	NG 68721/B NG 24268	SP1	3	30-40 cm	0,3	-	malacofauna
Ashaig	NG 68721/B NG 24268	SP1	4	40-50 cm	0,3	-	malacofauna
Ashaig	NG 68721/B NG 24268	SP1	5	50-60 cm	0,3	-	malacofauna, charcoal
Ashaig	NG 68721/B NG 24268	SP1	6	60-65 cm	0,15	-	malacofauna
Ashaig	NG 68721/B NG 24268	SP1	7	75-80 cm	0,25	-	malacofauna, fauna
Ashaig	NG 68721/B NG 24268	SP1	7	65-75 cm	0,3	-	malacofauna, charcoal
Ashaig	NG 68721/B NG 24268	SP1	8	75-80 cm	0,2	-	malacofauna

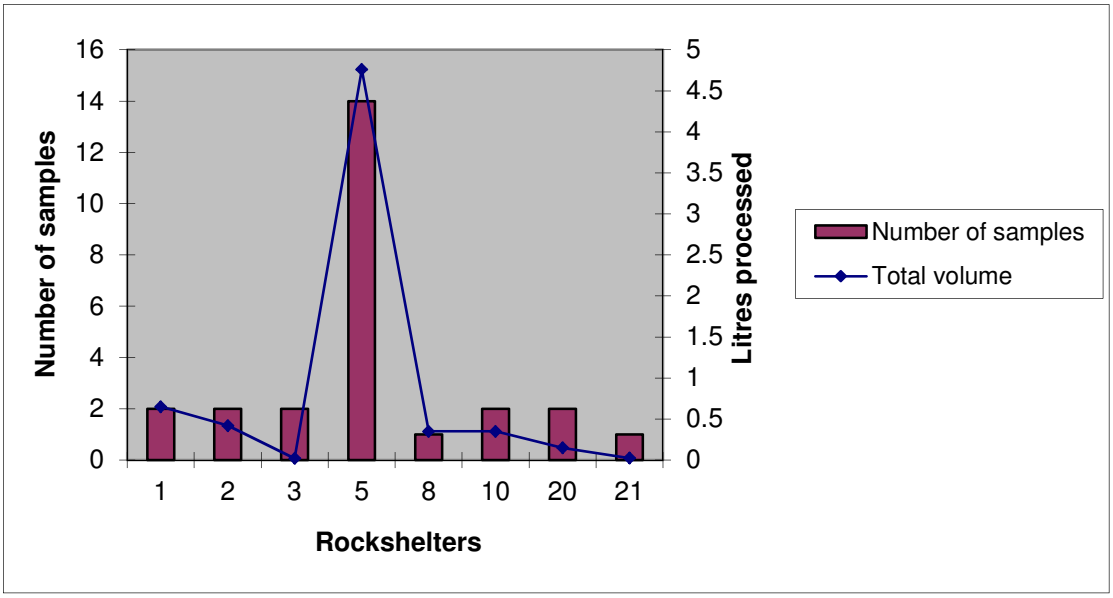
Ashaig	NG 68721/B NG 24268	SP2	2	20-30 cm	0,45	-	malacofauna, fauna, charcoal, seeds, lithics
Ashaig	NG 68721/B NG 24268	SP2	3	45-60 cm	0,55	-	malacofauna
Ashaig	NG 68683/B NG 24278	SP1		20-35 cm	0,5	-	fauna, malacofauna, charcoal
Ashaig	NG 68683/B NG 24278	SP1 (just below wall)	1	10-20 cm	0,3	-	malacofauna, ictiofauna, fauna, charcoal
Ashaig	NG 68683/B NG 24278	SP2	1 (lower)	0-10 cm	0,7	-	malacofauna, ictiofauna, fauna, charcoal, glass
Ashaig	NG 68683/B NG 24278	SP2	1	10-20 cm	0,4	-	malacofauna, lithic
Ashaig	NG 68683/B NG 24278	SP2	2	10-20 cm	0,55	-	malacofauna, fauna, ictiofauna, charcoal
Ashaig	NG 68683/B NG 24278	SP2	3	20-30 cm	0,5	-	malacofauna, fauna, metal

Appendix 4. Sample processing, survey sites.

Ferran Antolin.

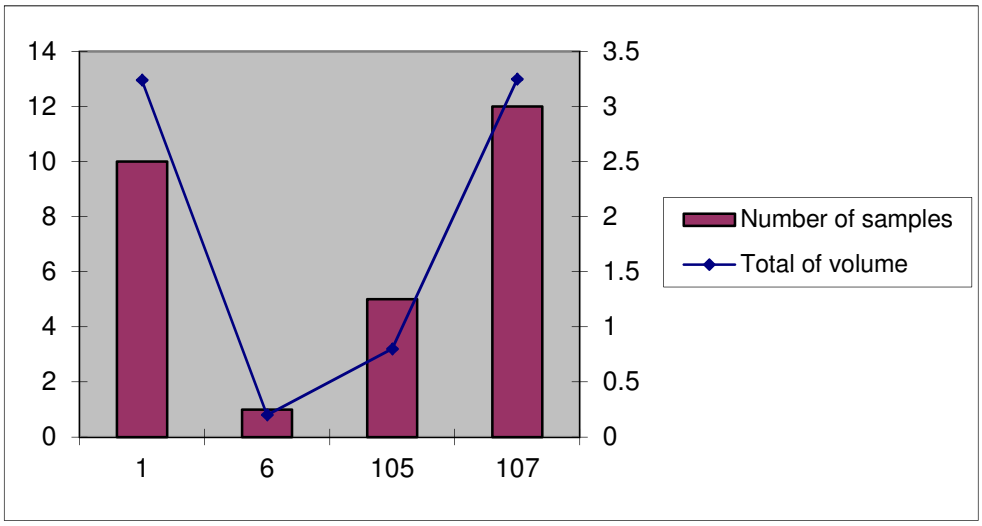
Raasay-Fairy Glen:

Twenty-six soil samples have been taken and processed (see Table XXX). The average volume per sample is 0,26 l., being 0,6 l. the highest measured volume and 0,01 l. the minimum. The samples belong to eight different rockshelters (1, 2, 3, 5, 8, 10, 20 and 21). The number of samples taken per rockshelter is quite unequal as shown in figure XXX.



Point of Sleat:

Twenty-eight samples have been taken and processed (see Table XXX). The average volume per sample is 0,29 l., being 0,5 l. the highest measured volume and 0,05 l. the minimum. The samples belong to four different rockshelters (1, 6, 105 and 107), but most of them come from shelters 1, 105 and 107, since they were the ones with more potentiality. As can be seen on Figure XXX, the samples taken from rockshelter 105 have less volume than the ones taken from rockshelters 1 and 107. That is due to the fact that it was located in a very rocky area.



Dunan:

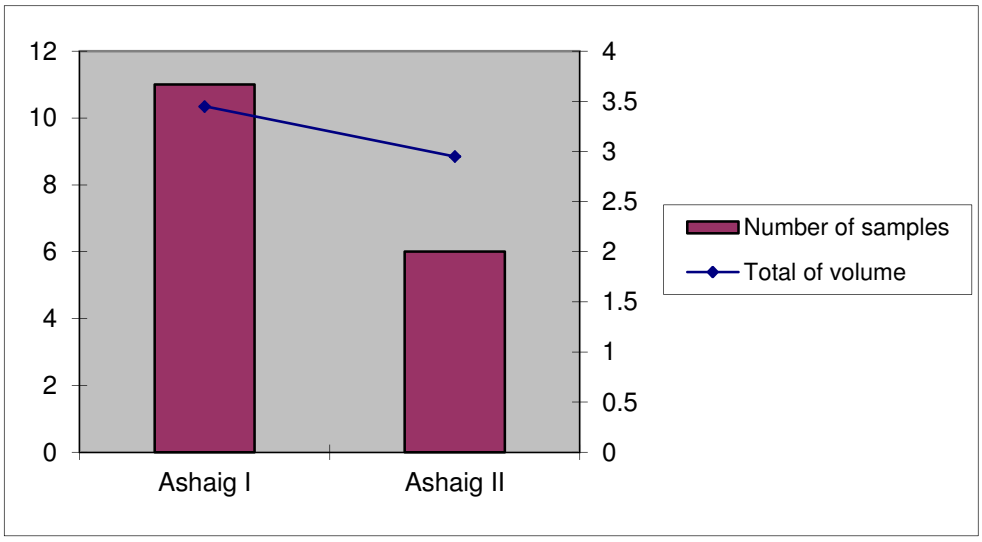
One site in Dunan was sampled. 0,35 litres of sediment were taken from two different samples. The results of the soil processing and sorting are shown in Table XXX.

Glenelg:

Only one small sample of 0,01 litres was taken from Glenelg.

Ashaig:

Two different sites were sampled in Ashaig: Ashaig I and Ashaig II. 6,4 litres were processed in total and 17 samples were taken. 11 came from Ashaig I (average volume per sample: 0,31 l.) and 6 from Ashaig II (average volume per sample: 0,49 l.) but the volume of sediment treated for both sites is similar, as shown in Figure XXX.



Appendix 5. List of photographs, survey sites

Oriol Lopez.

Name	Site	Content	Description	Orientation
Skye'09-1	Green Mounds	Green Mound 01	general view	
Skye'09-2	Green Mounds	Green Mound 01	general view	
Skye'09-3	Green Mounds	Green Mound 01	general view	
Skye'09-4	Green Mounds	Green Mound 02	general view	
Skye'09-5	Green Mounds	Green Mound 02	general view	
Skye'09-6	Green Mounds	field work	-	
Skye'09-7	Green Mounds	possible mound	general view	
Skye'09-8	Green Mounds	possible mound	general view	
Skye'09-9	Green Mounds	possible mound	general view	
Skye'09-10	Oronsay	Oronsay	general view	
Skye'09-11	Oronsay	Oronsay	midden situation	
Skye'09-12	Oronsay	rockshelter with a wall	inside and wall	
Skye'09-13	Oronsay	rockshelter with a wall	general view	
Skye'09-14	Raasay - Fairy Glen	Raasay - Fairy Glen	general view	N-S
Skye'09-15	Raasay - Fairy Glen	Raasay - Fairy Glen	general view	W-E
Skye'09-16	Raasay - Fairy Glen	Raasay - Fairy Glen		
Skye'09-17	Raasay - Fairy Glen	Raasay - Fairy Glen	general view	W-E
Skye'09-18	Raasay - Fairy Glen	Raasay - Fairy Glen		W-E
Skye'09-19	Raasay - Fairy Glen	Raasay - Fairy Glen	general view	
Skye'09-20	Raasay - Fairy Glen	Raasay - Fairy Glen		
Skye'09-21	Raasay - Fairy Glen	Raasay - Fairy Glen		
Skye'09-22	Raasay - Fairy Glen	Raasay - Fairy Glen	with Great Britain at the top	
Skye'09-23	Raasay - Fairy Glen	Raasey	general view	S
Skye'09-24	Raasay - Fairy Glen	Raasey	general view	N
Skye'09-25	Raasay - Fairy Glen	panoramic views	-	
Skye'09-26	Raasay - Fairy Glen	panoramic views	-	
Skye'09-27	Raasay - Fairy Glen	panoramic views	-	
Skye'09-	Raasay - Fairy Glen	Raasay - Fairy	with Sand at the top	

28		Glan		
Skye'09-29	Raasay - Fairy Glen	RFG-01	inside	
Skye'09-30	Raasay - Fairy Glen	RFG-01	general view	
Skye'09-31	Raasay - Fairy Glen	RFG-01	back entrance detail	
Skye'09-32	Raasay - Fairy Glen	RFG-01	general view of back entrance	
Skye'09-33	Raasay - Fairy Glen	PT without number	detail	
Skye'09-34	Raasay - Fairy Glen	PT without number	general view	N-S
Skye'09-35	Raasay - Fairy Glen	RFG-02	entrance	
Skye'09-36	Raasay - Fairy Glen	RFG-02	general view	S-N
Skye'09-37	Raasay - Fairy Glen	RFG-03	inside and wall	
Skye'09-38	Raasay - Fairy Glen	RFG-03	general view	NE-SW
Skye'09-39	Raasay - Fairy Glen	RFG-04	detail	
Skye'09-40	Raasay - Fairy Glen	RFG-04	general view	NE-SW
Skye'09-41	Raasay - Fairy Glen	RFG-04	general view	E-W
Skye'09-42	Raasay - Fairy Glen	PT without number	entrance	
Skye'09-43	Raasay - Fairy Glen	PT without number	detail	
Skye'09-44	Raasay - Fairy Glen	RFG-05	entrance detail and outer shell midden	
Skye'09-45	Raasay - Fairy Glen	RFG-05	general view	E-W
Skye'09-46	Raasay - Fairy Glen	RFG-06	entrance and inside	
Skye'09-47	Raasay - Fairy Glen	RFG-06	general view	E-W
Skye'09-48	Raasay - Fairy Glen	RFG-07	inside	
Skye'09-49	Raasay - Fairy Glen	field work	-	
Skye'09-50	Raasay - Fairy Glen	field work	-	
Skye'09-51	Raasay - Fairy Glen	panoramic views	-	
Skye'09-52	Raasay - Fairy Glen	panoramic views	-	
Skye'09-53	Raasay - Fairy Glen	RFG-08	general view	E-W
Skye'09-54	Raasay - Fairy Glen	field work	-	
Skye'09-55	Raasay - Fairy Glen	field work	-	
Skye'09-	Raasay - Fairy Glen	field work	-	

56				
Skye'09-57	Raasay - Fairy Glen	RFG-08	entrance and inside	NE-SW
Skye'09-58	Raasay - Fairy Glen	RFG-09	entrance and inside	
Skye'09-59	Raasay - Fairy Glen	RFG-09	general view	N-S
Skye'09-60	Raasay - Fairy Glen	RFG-10	inside	
Skye'09-61	Raasay - Fairy Glen	RFG-10	general view	SE-NW
Skye'09-62	Raasay - Fairy Glen	RFG-11	entrance and inside	
Skye'09-63	Raasay - Fairy Glen	RFG-11	general view	E-W
Skye'09-64	Raasay - Fairy Glen	RFG-12	general view	SE-NW
Skye'09-65	Raasay - Fairy Glen	RFG-12	detail	
Skye'09-66	Raasay - Fairy Glen	RFG-13	rockshelter	
Skye'09-67	Raasay - Fairy Glen	RFG-13	general view	SE-NW
Skye'09-68	Raasay - Fairy Glen	field work	-	
Skye'09-69	Raasay - Fairy Glen	field work	-	
Skye'09-70	Raasay - Fairy Glen	field work	-	
Skye'09-71	Raasay - Fairy Glen	RFG-14	entrance and inside	
Skye'09-72	Raasay - Fairy Glen	RFG-14	general view	NE-SW
Skye'09-73	Raasay - Fairy Glen	panoramic views	-	
Skye'09-74	Raasay - Fairy Glen	RFG-15	general view	N-S
Skye'09-75	Raasay - Fairy Glen	RFG-15	inside	
Skye'09-76	Raasay - Fairy Glen	RFG-16	rockshelter	
Skye'09-77	Raasay - Fairy Glen	RFG-16	general view	E-W
Skye'09-78	Raasay - Fairy Glen	RFG-17	entrance and inside	
Skye'09-79	Raasay - Fairy Glen	RFG-17	general view	S-N
Skye'09-80	Raasay - Fairy Glen	field work	-	
Skye'09-81	Raasay - Fairy Glen	field work	-	
Skye'09-82	Raasay - Fairy Glen	field work	-	
Skye'09-83	Raasay - Fairy Glen	RFG-18	PS1 - N profile	
Skye'09-	Raasay - Fairy Glen	RFG-18	PS1 - N profile	

84				
Skye'09-85	Raasay - Fairy Glen	RFG-18	PS1 - W profile	
Skye'09-86	Raasay - Fairy Glen	RFG-18	PS1 - W profile	
Skye'09-87	Raasay - Fairy Glen	RFG-18	entrance and wall	
Skye'09-88	Raasay - Fairy Glen	RFG-18	general view	
Skye'09-89	Raasay - Fairy Glen	RFG-18	PS1 - W profile	
Skye'09-90	Raasay - Fairy Glen	field work	-	
Skye'09-91	Raasay - Fairy Glen	RFG-20	entrance	
Skye'09-92	Raasay - Fairy Glen	RFG-20	general view	E-W
Skye'09-93	Raasay - Fairy Glen	field work	-	
Skye'09-94	Raasay - Fairy Glen	RFG-21	general view	N-S
Skye'09-95	Raasay - Fairy Glen	field work	-	
Skye'09-96	Raasay - Fairy Glen	RFG-21	inside and wall	
Skye'09-97	Raasay - Fairy Glen	RFG-19	rockshelter	
Skye'09-98	Raasay - Fairy Glen	RFG-19	general view	NW-SE
Skye'09-99	Raasay - Fairy Glen	panoramic views	-	
Skye'09-100	Raasay - Fairy Glen	panoramic views	-	
Skye'09-101	Raasay - Fairy Glen	panoramic views	-	
Skye'09-102	Point of Sleat	POS-030	PS1- profile	
Skye'09-103	Point of Sleat	POS-030	PS1- profile	
Skye'09-104	Point of Sleat	POS-030	detail	
Skye'09-105	Point of Sleat	POS-030	general view	
Skye'09-106	Point of Sleat	POS-030	PS1- profile	
Skye'09-107	Point of Sleat	sheep shelter		
Skye'09-108	Point of Sleat	sheep shelter		
Skye'09-109	Point of Sleat	POS-002	general view	
Skye'09-110	Point of Sleat	POS-003	general view	
Skye'09-111	Point of Sleat	POS-004	general view	
Skye'09-	Point of Sleat	POS-005	general view	

112			
Skye'09-113	Point of Sleat	POS-005	inside
Skye'09-114	Point of Sleat	POS-006	inside
Skye'09-115	Point of Sleat	POS-006	general view
Skye'09-116	Point of Sleat	POS-006	PS1- profile
Skye'09-117	Point of Sleat	POS-007	general view
Skye'09-118	Point of Sleat	POS-008	general view
Skye'09-119	Point of Sleat	POS-008	inside
Skye'09-120	Point of Sleat	POS-009	general view
Skye'09-121	Point of Sleat	POS-010	general view
Skye'09-122	Point of Sleat	POS-011	general view
Skye'09-123	Point of Sleat	POS-012	general view
Skye'09-124	Point of Sleat	POS-013	general view
Skye'09-125	Point of Sleat	POS-013	general view
Skye'09-126	Point of Sleat	POS-014	inside
Skye'09-127	Point of Sleat	POS-014	inside
Skye'09-128	Point of Sleat	POS-015	general view
Skye'09-129	Point of Sleat	POS-015	inside
Skye'09-130	Point of Sleat	POS-015	shells
Skye'09-131	Point of Sleat	POS-016	general view
Skye'09-132	Point of Sleat	POS-016	inside
Skye'09-133	Point of Sleat	POS-017	general view
Skye'09-134	Point of Sleat	POS-019	general view
Skye'09-135	Point of Sleat	panoramic views	-
Skye'09-136	Point of Sleat	POS-020	general view
Skye'09-137	Point of Sleat	POS-018	general view
Skye'09-138	Point of Sleat	POS-031	general view
Skye'09-139	Point of Sleat	POS-032	general view
Skye'09-	Point of Sleat	POS-033	entrance and inside

140			
Skye'09-141	Point of Sleat	POS-022	general view
Skye'09-142	Point of Sleat	POS-023	entrance and inside
Skye'09-143	Point of Sleat	POS-023	general view
Skye'09-144	Point of Sleat	POS-023	back entrance detail
Point of Sleat	Point of Sleat	Point of Sleat	Point of Sleat
Skye'09-146	Point of Sleat	POS-024	general view
Skye'09-147	Point of Sleat	POS-025	general view
Skye'09-148	Point of Sleat	POS-026	general view
Skye'09-149	Point of Sleat	POS-026	general view
Skye'09-150	Point of Sleat	POS-026	inside
Skye'09-151	Point of Sleat	POS-026	inside
Skye'09-152	Point of Sleat	POS-027	general view
Skye'09-153	Point of Sleat	POS-028	general view
Skye'09-154	Point of Sleat	POS-029	inside
Skye'09-155	Point of Sleat	POS-029	inside
Skye'09-156	Point of Sleat	POS-029	inside
Skye'09-157	Point of Sleat	POS-029	entrance and inside
Skye'09-158	Point of Sleat	Point of Sleat	Coastline
Skye'09-159	Point of Sleat	Point of Sleat	Coastline
Skye'09-160	Point of Sleat	Point of Sleat	Coastline
Skye'09-161	Point of Sleat	Point of Sleat	Coastline
Skye'09-162	Point of Sleat	Point of Sleat	Coastline
Skye'09-163	Point of Sleat	Point of Sleat	Coastline
Skye'09-164	Point of Sleat	Point of Sleat	Coastline
Skye'09-165	Point of Sleat	Point of Sleat	Coastline
Skye'09-166	Point of Sleat	Point of Sleat	Coastline
Skye'09-167	Point of Sleat	Point of Sleat	Coastline
Skye'09-	Point of Sleat	Point of Sleat	Coastline

168			
Skye'09-169	Point of Sleat	Point of Sleat	Coastline
Skye'09-170	Point of Sleat	Point of Sleat	Coastline
Skye'09-171	Point of Sleat	Point of Sleat	Coastline
Skye'09-172	Point of Sleat	Point of Sleat	Coastline
Skye'09-173	Point of Sleat	Point of Sleat	Coastline
Skye'09-174	Point of Sleat	Point of Sleat	Coastline
Skye'09-175	Point of Sleat	Point of Sleat	Coastline
Skye'09-176	Point of Sleat	Point of Sleat	Coastline
Skye'09-177	Point of Sleat	Point of Sleat	Coastline
Skye'09-178	Point of Sleat	Point of Sleat	Coastline
Skye'09-179	Point of Sleat	Point of Sleat	Coastline
Skye'09-180	Point of Sleat	Point of Sleat	Coastline
Skye'09-181	Point of Sleat	Point of Sleat	Coastline
Skye'09-182	Point of Sleat	Point of Sleat	Coast line
Skye'09-183	Point of Sleat	Point of Sleat	Coast line
Skye'09-184	Point of Sleat	Point of Sleat	Coast line
Skye'09-185	Point of Slate	Point of Sleat	Coast line
Skye'09-186	Point of Sleat	Point of Sleat	Coast line
Skye'09-187	Point of Sleat	Point of Sleat	Coast line
Skye'09-188	Point of Sleat	Point of Sleat	Coast line
Skye'09-189	Point of Sleat	Point of Sleat	Coast line
Skye'09-190	Point of Sleat	Point of Sleat	Coast line
Skye'09-191	Point of Sleat	Point of Sleat	Coast line
Skye'09-192	Point of Sleat	Point of Sleat	Coast line
Skye'09-193	Point of Sleat	Point of Sleat	Coast line
Skye'09-194	Point of Sleat	Point of Sleat	Coast line
Skye'09-195	Point of Sleat	Point of Sleat	Coast line
Skye'09-	Point of Sleat	Point of Sleat	Coast line

196			
Skye'09-197	Point of Sleat	Point of Sleat	Coastline
Skye'09-198	Point of Sleat	Point of Sleat	Coastline
Skye'09-199	Point of Sleat	Point of Sleat	Coastline
Skye'09-200	Point of Sleat	Point of Sleat	Coastline
Skye'09-201	Point of Sleat	Point of Sleat	Coastline
Skye'09-202	Point of Sleat	Point of Sleat	Coastline
Skye'09-203	Point of Sleat	Point of Sleat	Coastline
Skye'09-204	Point of Sleat	Point of Sleat	Coastline
Skye'09-205	Point of Sleat	Point of Sleat	Coastline
Skye'09-206	Point of Sleat	Point of Sleat	Coastline
Skye'09-207	Point of Sleat	Point of Sleat	Coastline
Skye'09-208	Point of Sleat	Point of Sleat	Coastline
Skye'09-209	Point of Sleat	Point of Sleat	Coastline
Skye'09-210	Point of Sleat	Point of Sleat	Coastline
Skye'09-211	Point of Sleat	Point of Sleat	Coastline
Skye'09-212	Point of Sleat	Point of Sleat	Coastline
Skye'09-213	Point of Sleat	Point of Sleat	Coastline
Skye'09-214	Point of Sleat	Point of Sleat	Coastline
Skye'09-215	Point of Sleat	Point of Sleat	Coastline
Skye'09-216	Point of Sleat	Point of Sleat	Coastline
Skye'09-217	Point of Sleat	Point of Sleat	Coastline
Skye'09-218	Point of Sleat	Point of Sleat	Coastline
Skye'09-219	Point of Sleat	Point of Sleat	Coastline
Skye'09-220	Point of Sleat	Point of Sleat	Coastline
Skye'09-221	Point of Sleat	Point of Sleat	Coastline
Skye'09-222	Point of Sleat	Point of Sleat	Coastline
Skye'09-223	Point of Sleat	Point of Sleat	Coastline
Skye'09-	Point of Sleat	Point of Sleat	Coastline

224			
Skye'09-225	Point of Sleat	Point of Sleat	Coastline
Skye'09-226	Point of Sleat	Point of Sleat	Coastline
Skye'09-227	Point of Sleat	Point of Sleat	Coastline
Skye'09-228	Point of Sleat	Point of Sleat	Coastline
Skye'09-229	Point of Sleat	Point of Sleat	Coastline
Skye'09-230	Point of Sleat	Point of Sleat	Coastline
Skye'09-231	Point of Sleat	Point of Sleat	Coastline
Skye'09-232	Point of Sleat	Point of Sleat	Coastline
Skye'09-233	Point of Sleat	Point of Sleat	Coastline
Skye'09-234	Point of Sleat	Point of Sleat	Coastline
Skye'09-235	Point of Sleat	Point of Sleat	Coastline
Skye'09-236	Point of Sleat	Point of Sleat	Coastline
Skye'09-237	Point of Sleat	Point of Sleat	Coastlline
Skye'09-238	Point of Sleat	Point of Sleat	Coastline
Skye'09-239	Point of Sleat	Point of Sleat	Coastline
Skye'09-240	Point of Sleat	Point of Sleat	Coastline
Skye'09-241	Point of Sleat	Point of Sleat	Coastlline
Skye'09-242	Point of Sleat	Point of Sleat	Coastline
Skye'09-243	Point of Sleat	Point of Sleat	Coastline
Skye'09-244	Point of Sleat	Point of Sleat	Coastline
Skye'09-245	Point of Sleat	Point of Sleat	Coastline
Skye'09-246	Point of Sleat	Point of Sleat	Coastline
Skye'09-247	Point of Sleat	Point of Sleat	Coastline
Skye'09-248	Point of Sleat	Point of Sleat	Coastline
Skye'09-249	Point of Sleat	Point of Sleat	Coastline
Skye'09-250	Point of Sleat	Point of Sleat	Coastline
Skye'09-251	Point of Sleat	Point of Sleat	Coastline
Skye'09-	Point of Sleat	Point of Sleat	Coastline

252			
Skye'09-253	Point of Sleat	Point of Sleat	Coastline
Skye'09-254	Point of Sleat	Point of Sleat	Coastline
Skye'09-255	Point of Sleat	Point of Sleat	Coastline
Skye'09-256	Point of Sleat	Point of Sleat	Coastline
Skye'09-257	Point of Sleat	Point of Sleat	Coastline
Skye'09-258	Point of Sleat	Point of Sleat	Coastline
Skye'09-259	Point of Sleat	Point of Sleat	Coastline
Skye'09-260	Point of Sleat	Point of Sleat	Coastline
Skye'09-261	Point of Sleat	Point of Sleat	Coastline
Skye'09-262	Point of Sleat	Point of Sleat	Coastline
Skye'09-263	Point of Sleat	Point of Sleat	Coastline
Skye'09-264	Point of Sleat	Point of Sleat	Coastline
Skye'09-265	Point of Sleat	Point of Sleat	Coastline
Skye'09-266	Point of Sleat	Point of Sleat	Coastline
Skye'09-267	Point of Sleat	Point of Sleat	Coastline
Skye'09-268	Point of Sleat	Point of Sleat	Coastline
Skye'09-269	Point of Sleat	Point of Sleat	Coastline
Skye'09-270	Point of Sleat	Point of Sleat	Coastline
Skye'09-271	Point of Sleat	Point of Sleat	Coastline
Skye'09-272	Point of Sleat	Point of Sleat	Coastline
Skye'09-273	Point of Sleat	Point of Sleat	Coastline
Skye'09-274	Point of Sleat	Point of Sleat	Coastline
Skye'09-275	Point of Sleat	Point of Sleat	Coastline
Skye'09-276	Point of Sleat	Point of Sleat	Coastline
Skye'09-277	Point of Sleat	Point of Sleat	Coastline
Skye'09-278	Point of Slate	Point of Sleat	Coastline
Skye'09-279	Point of Sleat	Point of Sleat	Coastline
Skye'09-	Point of Sleat	Point of Sleat	Coastline

280			
Skye'09-281	Point of Sleat	Point of Sleat	Coastline
Skye'09-282	Point of Sleat	Point of Sleat	Coastline
Skye'09-283	Point of Sleat	Point of Sleat	Coastline
Skye'09-284	Point of Sleat	Point of Sleat	Coastline
Skye'09-285	Point of Sleat	Point of Sleat	Coastline
Skye'09-286	Point of Sleat	Point of Sleat	Coastline
Skye'09-287	Point of Sleat	Point of Sleat	Coastline
Skye'09-288	Oronsay	field work	-
Skye'09-289	Oronsay	field work	-
Skye'09-290	Oronsay	Green Mound s	general view
Skye'09-291	Oronsay	Green Mound s	general view
Skye'09-292	Oronsay	Green Mound s	general view
Skye'09-293	Raasay - Fairy Glen	field work	-
Skye'09-294	Raasay - Fairy Glen	field work	-
Skye'09-295	Raasay - Fairy Glen	field work	-
Skye'09-296	Raasay - Fairy Glen	RFG-01	entrance
Skye'09-297	Raasay - Fairy Glen	RFG-01	entrance
Skye'09-298	Raasay - Fairy Glen	RFG-01	entrance
Skye'09-299	Raasay - Fairy Glen	field work	-
Skye'09-300	Raasay - Fairy Glen	field work	-
Skye'09-301	Raasay - Fairy Glen	RFG-02	entrance
Skye'09-302	Raasay - Fairy Glen	panoramic views	-
Skye'09-303	Raasay - Fairy Glen	field work	-
Skye'09-304	Raasay - Fairy Glen	field work	-
Skye'09-305	Raasay - Fairy Glen	field work	-
Skye'09-306	Raasay - Fairy Glen	panoramic views	-
Skye'09-307	Raasay - Fairy Glen	RFG-08	general view
Skye'09-	Raasay - Fairy Glen	field work	-

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Skye'09-309	Raasay - Fairy Glen	field work	-
Skye'09-310	Point of Sleat	Point of Sleat	Coastline
Skye'09-311	Point of Sleat	Point of Sleat	Coastline
Skye'09-312	Point of Sleat	Point of Sleat	Coastline
Skye'09-313	Point of Sleat	Point of Sleat	Coastline
Skye'09-314	Point of Sleat	Point of Sleat	Coastline
Skye'09-315	Point of Sleat	Point of Sleat	Coastline
Skye'09-316	Point of Sleat	Point of Sleat	Coastline
Skye'09-317	Point of Sleat	Point of Sleat	Coastline
Skye'09-318	Point of Sleat	Point of Sleat	Coastline
Skye'09-319	Point of Sleat	Point of Sleat	Coastline
Skye'09-320	Point of Sleat	Point of Sleat	Coastline
Skye'09-321	Point of Sleat	Point of Sleat	with Rum at the top
Skye'09-322	Point of Sleat	Point of Sleat	Coastline
Skye'09-323	Point of Sleat	Point of Sleat	Coastline
Skye'09-324	Point of Sleat	Point of Sleat	Coastline
Skye'09-325	Point of Sleat	POS-105	entrance
Skye'09-326	Point of Sleat	POS-106	entrance
Skye'09-327	Point of Sleat	POS-107	entrance
Skye'09-328	Point of Sleat	POS-107	entrance
Skye'09-329	Point of Sleat	POS-108	inside and wall

Appendix 6. List of shells, Camas Beach and Otter Cave

Eva Laurie

Camas Beach midden										
Stratigraphic Level	Top Shell Gibbula species	Edible Periwinkle *Littorina littorea*	Other Littorina species	Dog Whelk *Nucella lapillus*	Other Whelk species	Horse Mussel *Modiolus modiolus*	Mussel *Mytilus edulis*	Razor Shell Ensis species	Limpet Patella species	Total %
CT1 006	0.06	25.64				0.45	0.27		73.56	99.98
CT1 007	0.18	33.36	0.18				0.47		65.78	99.97
CT1 A	0.06	42.04	0.36	1.08	0.25		0.20	0.03	55.93	99.95
CT1 B	0.01	39.62	0.23	0.36	0.03		0.10		59.62	99.97
CB5	0.13	31.78	0.10				0.03		67.93	99.97
CB10		27.82					0.02		75.15	99.99
CB15		37.27	0.05	0.05			0.02		62.57	99.96
CB20		34.20	0.17				0.04		65.58	99.99
CB25		22.32	0.27	0.55			0.04		76.80	99.98
CB30		30.02	0.05				0.05		69.86	99.98
CB35	0.09	26.38	0.24				0.04		73.22	99.97
CB40	0.04	43.55	0.04				0.18		56.16	99.97
CB45		22.17	0.18				0.03		77.60	99.98
CB50		61.79	0.50	1.00			0.18		36.56	100.03
CB55	0.03	20.77	0.15				0.07	0.15	78.79	99.96
CB60	0.07	18.54	0.03	0.47			0.03	0.31	80.50	99.95
CB65	0.07	25.29		0.07	0.07		0.03		74.45	99.98
CB70		47.67		0.21			0.36		51.74	99.98
CB75		53.45		0.79			0.03	0.13	45.58	99.98

. Table 3: Weight analysis by species percentage within each level for Camas Daraich rock shelter.

Otter Cave								
Stratigraphic Level	Top Shell Gibbula species	Edible Periwinkle *Littorina littorea*	Other Littorina species	Dog Whelk *Nucella lapillus*	Horse Mussel *Modiolus modiolus*	Mussel *Mytilus edulis*	Limpet Patella species	Total %
B2	0.22	26.62	0.44	3.35			69.35	99.98
B3 Cut 4						100.00		100.00
C1 1˚ Cut		32.01	1.26	9.19			57.36	99.97
C1 2˚ Cut	0.17	35.12	0.51	1.21	1.03	0.15	61.24	99.97
C1 3˚ Cut	0.08	47.35	0.08	0.42		0.69	51.87	99.97
C2 1˚ Cut	0.37	70.58	0.18			0.17	28.84	99.97
C2 2˚ Cut		71.51	0.30	1.21			26.96	99.98