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ADAPTING TO MARGINAL ENVIRONMENTS?
INTERIM CIE FIELD REPORT ON SURVEYS AND SAMPLING
IN THE SOUTHERN PART OF THE NORSE EASTERN SETTLEMENT
SUMMER 2016

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NABO
North Atlantic Biocultural Organisation

Contents:

Introduction: CIE & WiCP

The CIE/WiCP field work in South Greenland 2016 was carried out between 3.-11. July 2016 as collaboration between two parallel projects, both based at the National Museum of Denmark, but carried out in collaboration with Greenland National Museum & Archives:

- *Comparative Island Ecodynamics in the North Atlantic Project (CIE):* The CIE (Jette Arneborg, Christian Koch Madsen, Ian Simpson, Michael Nielsen, and Cameron Turley) is a Nation Science Foundation (NSF)-funded project that seeks to improve scientific understanding of complex interactions between human governance, climate change, human environmental impact, and world system effects on the diverging fates of two closely related Scandinavian communities in medieval Greenland and Iceland. What are the lessons from these two thousand year cases of long-term human ecodynamics with radically different outcomes? And how can these cases of the past be mobilized to serve modern efforts to secure a genuinely sustainable future? What lessons of survival and extinction can be learned and taught for both local northern community heritage and for global education for sustainability?
- *Winter is Coming Project (WiCP):* The WiCP (Christian Koch Madsen) is a Danish Council for Independent Research-funded postdoctoral project that investigates the dynamics and timing of Norse settlement and land use in marginal parts of the Norse Eastern Settlement to ascertain if, and to which extent, climate change and environmental deterioration leading up to the Little Ice SAge was a major driver of settlement change, and ultimately abandonment, in Norse Greenland.

Research objectives and themes – Greenland:

Both the above projects share the same overarching research question: *Why didn't Norse Greenland survive multiple stresses in the later Middle Ages when Iceland did?* This question is addressed through several guiding research focal points:

- Resilience to climate changes vs. victims to historical and cultural conjunctures.
- Identity and cultural limits to adaptation.
- Subsistence (climate impacts, farming and hunting practices, changing settlement patterns).
- Social organization - governance and the ecclesiastical landscape.
- Local and inter-regional interactions Norse Greenland/Iceland/Europe and Norse/Inuit.
- Does increased dependence on the marine resources (migrating seals) result in increased Norse coastal settlement? And how does that impact social structure?
- The organization of trade and exchanges with Europe.

Field season strategy and aims:

As suggested of the title of this interim field report, the aims of this Greenland CIE sub-project is to investigate Greenland organization and temporal development of Norse settlement and land use in more marginal areas of the Norse Eastern Settlement. It is our guiding hypothesis that regions such as the selected case study areas are liable to demonstrate early negative effects of the deteriorating climatic and environmental conditions at the 13th century onset of the 'Little Ice Age'. Accordingly, these settlement areas should also be most prompt to reveal signs of early socio-economic stress, i.e. decline in, or even abandonment of, settlement and farming activities.

If the marginal areas do not display such signs of stress, then other explanatory models for settlement development must be considered. For instance, the marginal settlement may only have been so in terms of farming, while on the other hand being better situated to exploit marine mammals and driftwood resources. If the latter holds true, it could mean that Norse resource exploitation was even more organized than previously envisaged and with implications for the dynamics of the larger Norse social-ecological as a whole.

Whereas the aim of the 2013 CIE-field season was to scout out suitable case study areas, the 2014-16 CIE-field seasons have been aimed at providing detailed site surveys and samples sets for dating site histories, as well as local agricultural and environmental developments on Norse sites in a transect from Nanortalik area to the Qooroq Henrik Lund at the head of the Uunartoq Fjord.

CIE/WiCP Field Season 2016 Outline and Methodology

Participants and responsibilities: Christian Koch Madsen (CKM), field leader and in charge of surveys; Ian Simpson (IS), in charge of infield and midden trenching and sampling; Michael Nielsen (MN), in charge of midden judgemental coring and logistics; Cameron Turley, field assistant.

Site surveys: These were carried out with a Leica SR20 DGPS. All the Norse ruins, as well as most Inuit, were surveyed on each site, as well as described and photo documented individually. The survey data has been post processed using Leica GeoOffice v.7.0. The ruins have been numbered after the oldest existing survey. The central farming area was photographed with an DJI Phantom 3 Vision+ UAV, allowing for the projection of an accurate local elevation model. The aerial photographs still await post processing. All survey data and imagery is found with C.K. Madsen, the National Museum of Denmark/Greenland National Museum and is currently being processed.

Infield sampling: In the field homefield areas were identified by their distinctive Festuca rubra and associated grassland cover; small sections on transect lines across the homefield area were assessed with one 50x50cm representative section systematically described for Munsell colour, texture and structure. Sections were drawn at a scale of 1:10. Sections were carefully examined to collect fine charcoal fragments, with a typical weight of less than 2g, and the sections samples using 8x5x5cm Kubiena tins. Samples were brought with Ian Simpson to Sterling University for further analysis.

Judgemental midden coring: All sites with a midden were systematically cored with an extendable 2 cm diameter hand corer for observing preservation conditions. Cores were described and interpreted in terms of stratigraphy. In few instances where ruins were very poorly preserved and uncertain, we test cored for traces of cultural material. After locating the thickest part of the midden, a test trench of maximum 1x1 m was opened to access and document cultural strata, and to retrieve samples for dating. All original notes are found with M. Nielsen, University of Greenland. Charcoal samples were brought with Ian Simpson to Stirling University.

Upon conclusion of the project, all data and finds will be returned to the Greenland National Museum & Archives.

Figure 1. The 2016 field team resting at the head of the Uunartoq fjord, from left to right: Christian Koch Madsen (CKM), National Museum of Denmark/Greenland National Museum & Archive; Ian Simpson (IS), The University of Sterling; Michael Nielsen (MN), University of Greenland; Cameron Turley (CT), City University of New York.

CIE/WiCP Field Season 2016 Summary Results

Site Surveys Summary: The result of the 2016 surveys is summarized in Table 1: 13 sites were visited and surveyed, resulting in 67 Norse and 23 Inuit ruins being documented in detail. As is seen from Table 1, some sites revealed a quite a few new ruins or at least as many as earlier recorded (either due to their removal, poor descriptions, faulty interpretation etc.). Of these sites, Ø134 can be described as a large dispersed farmstead, Ø97 and Ø153 as small or medium farmsteads, whereas the rest of the sites represent various types of shielings, 1603 perhaps being a marine hunting station. The final new site 1603 is a Thule culture caribou drive, to our knowledge the first to be recorded as such in South Greenland (although written evidence suggests other drives should be present).

Table 1: 2016 Field Season Summary Results

Site No.	Date Visited	Norse ruins prior to 2016	Norse ruins post 2016	Inuit features	Homefield samples	Midden samples
Ø97 (NKAH 3785)	08-07-2016	7	10	4	Yes	Yes
Ø134 (NKAH 3510)	04-07-2016	26	34	5	Yes	Yes
Ø153* (NKAH 3753)	09-07-2016	-	14	-	Yes	Yes
Ø306 (NKAH 3787)	10-07-2016	2	1	2	Yes	No
Ø307 (NKAH 3786)	10-07-2016	1	1	-	No	No
Ø316 (NKAH 3772)	09-07-2016	2	2	-	Yes	No
Ø343 (NKAH 3430)	06-07-2016	2	5	-	Yes	No
Ø344 (NKAH 3426)	06-07-2016	2	2	9	Yes	No
Ø345 (NKAH 3428)	05-07-2016	7	6	1	Yes	No
Ø346 (NKAH 3429)	05-07-2016	2	3	1	Yes	No
1601 (NKAH 4468)	05-07-2016	1 (4)	1 (4)	-	Yes	No
1602	08-07-2016	2	2	-	No	No
1603	10-07-2016	-	-	1	No	No
Total:		54	67	23	-	-

* Ø153 was surveyed in 2015, but revisited in 2016 to obtain samples from the midden and homefield.

Judgemental midden coring and test trenching summary: Only at three sites–Ø97, Ø134, and Ø153–were we able to observe and test trench middens. All three proved to be fairly shallow middens with poor preservation, thus confirming what we have generally observed the previous years, i.e. that most midden preservation is now gone. The three midden all provided samples for 14C-dating.

Homefield sampling: Home samples were retrieved from 10 sites (annex 1), five of which contained enough charcoal for 14C-dating (results pending). The samples await analysis.

Field Diary 2016

The CIE field season 2016 followed field work for Greenland National Museum & Archives that began June 21. and which allowed us to prepare for the CIE field work reported here for the period 3. July - 11. July:

3. July: We woke up 06.00 to a brisk wind, had breakfast and then took down our camp in Igaliku. 07.15 we were transported to the harbor with all the remaining equipment not already stored there. Minor problems with the boat engine delayed our departure from Igaliku until ca. 09.30. By then we sailed directly for Qaqortoq to do shopping of field supplies and gas. About 12.20 we were finished and set out for Alluitsup Paa, which we reached ca. 14.15 having done a small break on the way because we met and chatted with a local going in the same direction.

Ca. 14.45 we continued on from Alluitsup Paa towards Sermersooq, where we intended to set up basecamp at Ø134. Winds, waves and currents were changing constantly throughout this journey. Only a few kilometers from the site, we encountered the Viking ship "Skjoldungen" travelling in opposite direction up the fjord. We exchanged a few words with the crew and then headed on towards Ø134.

Shortly after our rendezvous with "Skjoldungen" and continuing towards Ø134, the wind quite suddenly picked up and made it impossible to land at the site as there is no sheltered harbor or anchoring anywhere near. Instead, we cut across to the other side of the fjord to the inlet at Anillua (by Ø348), which we had visited in 2014 and knew to be a sheltered and well-suited campsite. We finished setting up camp there around 18.00.

Weather: Most of the day rather calm, warm and sunny, even on the coastal stretches, although occasionally with some changing fjord wind.

4. July: After breakfast we headed directly back to Ø134 and started working the site, which we had planned to do the entire day because of the size of the site. We were finished around 17.00 and headed back to our basecamp at Anillua.

Weather: A beautiful warm, calm and sunny summer day, which changing fjord wind that never truly picked up and subsided completely in the afternoon.

5. July: Although we woke to a quiet beautiful dawn, a storm warning by the weather forecast made us to head to Nanortalik around 07.30, to buy gas and to check with local hunters how they believed the weather would develop. They advised us to just head out as they did not believe in the storm warning of weather forecast. So, we headed south around Nanortalik island and towards Kangeq on the very southern tip of Sermersooq, where we arrived ca. 09.30. We quickly localized the single ruin (1601) rightly interpreted to be Norse and an hour of searching for additional ruins did not reveal any.

Around 14:00 we sailed for Ø346, where we quickly found and surveyed the ruins. We then headed for Ø345, which we also quickly found and worked through, allowing us to head back towards base camp ca. 18:00

Weather: Mostly calm and warm day with some changing winds and intermittent light cloud cover.

6. July: Around 8:30 we sailed for Ø344, but because it is misplaced on the maps, we spent some time searching for it. We surveyed and sampled the site over the course of 1 ½ hour and then sailed for Ø343, which also managed to quickly find and finish working in about 1 ½ hour. We then headed back towards

Sermersooq to walk up the dramatic narrow valley before Ø344. On our way out we searched the south side of the river for ruins, but found none. We then headed back to base camp, arriving there ca. 17:45.

Weather: High light cloud cover, but otherwise mostly calm and mild throughout the day.

7. July: We struck camp and ca. 9:30 we headed from Anillua across the fjord to Ø134 to allow IS to finish sampling the homefield. Having spent about an hour doing so, we headed north up the east coast of Sermersooq towards Alluitsup Paa. On the way we made a quick detour into the deep bay on the northern end of Sermersooq, Sermersuup Kangerlua, which presents an excellent sheltered harbor. We sailed along the coast of the bay while scouting for anything that looked like Norse or other features, but finding nothing. The vegetation on the slopes of the bay are fairly lush, and it seems reasonable that a shieling could be hidden somewhere around the bay a bit up from the beach.

We then continued onwards to Alluitsup Paa, to buy food and gas and have lunch. We left the settlement about 15:45 and sailed towards Lichtenau to have a quick look at the place. Close to the shore we observed an eroding midden (from sheep trampling) producing well-preserved bones and colonial artifacts (fajance, beads etc.). We photo documented the eroding section and took off again.

From Lichtenau we headed straight for Uunartoq, where we established our new base camp and had dinner around 18:00. We then went to the hot spring to have a well-deserved bath.

Weather: all day high and light cloud cover, cool, but with little wind (except in the strait between Tuttutuarssuk and Qunnermiut, where we always experience some wind and waves).

8. July: Following breakfast we sailed up the Uunartoq fjord towards its very head and Ø97. Because of varying descriptions of where this site is supposed to be located, we first anchored and hiked up the southern side of the valley. Climbing over a small ridge a little ways up, we could see the site further into the valley, but on the northern side of the river, so we decided to head back and sail to the other side. However, since we now knew the location, we decided to try and sail up the river, which we managed to do and could get fairly close to the site before the waters got too shallow. Incidentally, this landing site is also the place of a major Thule-culture summer camp.

However, because we could find nowhere to anchor the boat, IS, MN, and CT got off, while CKM headed back towards the head of the bay, where he moored the boat and headed on foot back to the site. We then spent ca. 4 hours sampling and surveying the site, 1 hour of which was spent on searching for new ruins. Two new ones were located, but more could hide in the fair shrub that covers the slopes on both sides of the river (which CKM forded to survey the ruins on the south side).

We then headed back towards the boat and upon reaching the fjord, surveyed the small Norse site that Ove Bak had registered there (1602). We were finished ca. 18:00, but at that time the boat was still moored on the shallow silty seabed and we had to wait for the tide to come in. However, already by 18:30 we could start towing the boat out to deeper water and head for base camp, where we arrived ca. 19:15.

Weather: Slight and high cloud cover, mild and with only a gentle fjord wind.

9. July: In the morning we headed to Ø153 and CKM, IS, and CT immediately started hiking up towards Ø316, while MN stayed back at the farm to search and sample any good midden area he could find, while watching the boat. We left the ruin group ca. 09:00 and reached Ø316 ca. 11:00, doing the climb in a relaxed pace. Having spent about 1 ½ hour surveying and sampling the site, we headed down again, this time following the stream from the lake by the site. The descent back to Ø151 only took ca. 50 min.

MN then sailed CKM across the fjord to the bay Maligiaq, where CKM was going to search for an enclosure to be located in a pass from Ø149 according to a 19th century description. CKM took the wrong pass and instead of going up the right one, searched the plain south of Ø149 for ruins, but finding none. However, this hinterland to the nunnery is exceedingly lush and must have been of quite high value as the site's home pasture. Meanwhile, IS and CT finished the work at Ø151, were picked up by MN to head for Ø162 to finish up some minor sampling there. However, they were forced to abandon this endeavor due to increasing wind and waves. Instead, they picked up CKM and we all headed back to base camp, arriving there ca. 18:00.

Weather: Overcast and from ca. 10:00 with a few drops of rain, which subsided again and was replaced by a cool and brisk wind from the fjord.

10. July: After breakfast, we headed back to Maligiaq, where CKM had forgotten his camera, which he found up by the pass he had investigated the previous day. CKM found the camera at the very top of the pass and headed back to the others waiting by the boat.

From there we headed back to the head of the Uunartoq fjord, sailed up the river to the Thule-culture summer camp, where IS and CKM jumped off the boat to hike up to Ø306-307. Meanwhile MN and CT stayed back to take a day off. CKM and IS began the hike from Ø97 ca. 10:40 and in a moderate pace, we reached Ø307 ca. 13:20, although we had a bit of trouble locating the ruin. Both Ø306 and 307 proved to be grossly misplaced on the maps (with up to 2 km). In addition, the terrain of the valley makes for terrible hiking, dense shrub intermittently giving way to gravelly erosion alluvial fans with loose stones and gravel that had to be traversed. Still, we reached Ø306 ca. 15:00, again having spent some time to located the site.

Ca. 16:00 we started back for the fjord, this time going down the valley a bit up the slope rather than along the river, which we had done on our way up the valley. This route was only slightly easier, but it did allow us to locate the new feature 1603. Looking to the other side, it would seem that the south side of the river offers an easier hike up the valley. Having surveyed 1603, we reached the MN and CT waiting in the boat by the fjord only by ca. 19:30 and were back in base camp ca. 20:30.

Weather: Cloudy, but mild and only with a moderate fjord wind.

11. July: Having had a long and hearty breakfast, we took down our base camp and packed the boat. Leaving Uunartoq ca. 10:40, we sailed to Alluitsup Paa and from there directly to Qaqortoq, where we had lunch and bought supplies for the excavation team that was going to arrive in a few days. Having finished this work, we then sailed to Igaliku, arriving there ca. 19:15 and were invited to dine with the personnel of the hotel.

Weather: all day calm and cloudy, from ca. 15:00 with some rain.

12. July: After breakfast, IS was picked up to be transferred to Narsuarsuaq. This concluded the CIE surveys and samples of 2016.

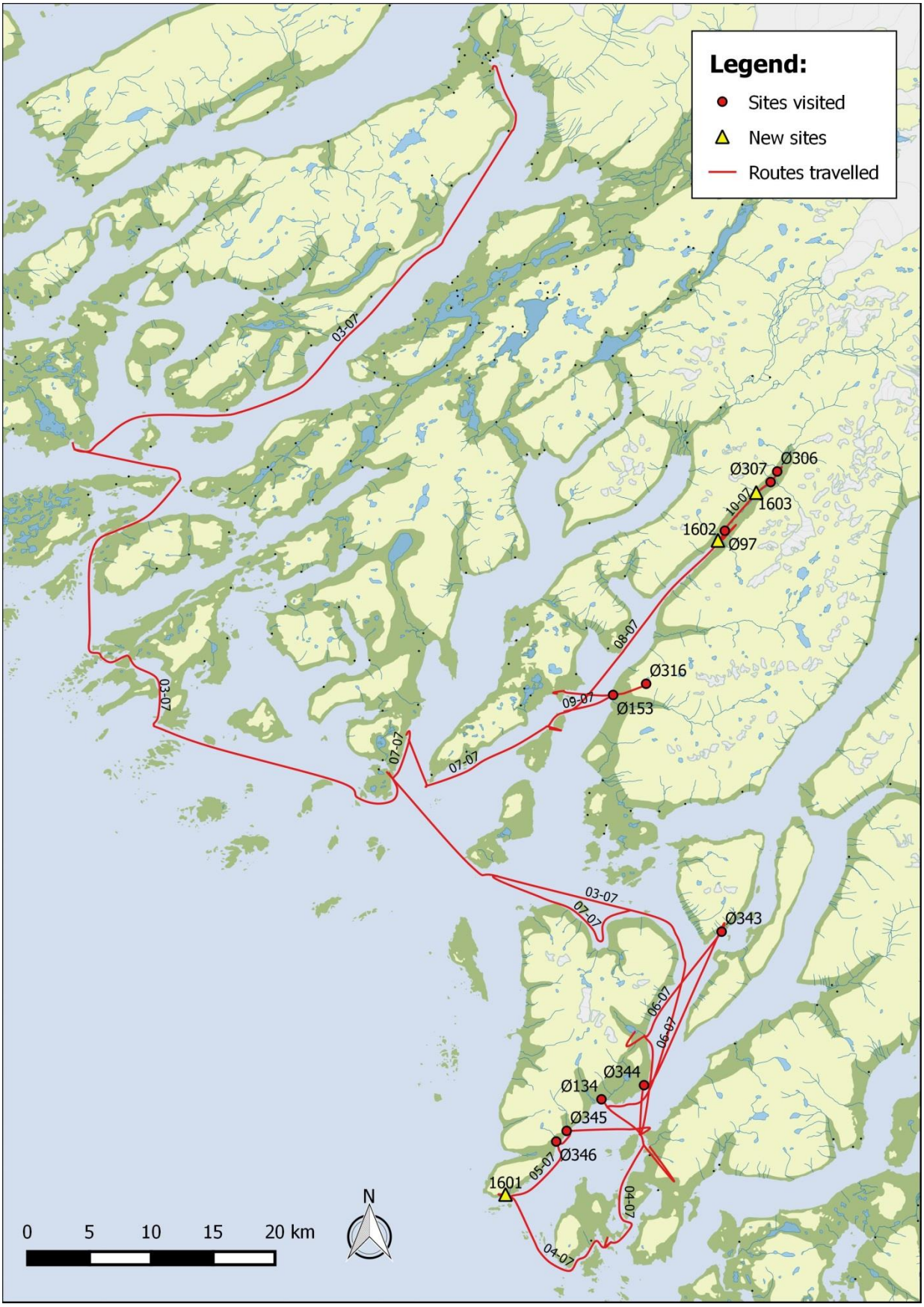

Figure 2. Routes travelled and sites visited during the 2016 field work.

Ø97 (60V2-0IV-514) - Qinngua NKAH 3785

Medium farmstead (10 Norse features). **UTM 23N 496,185.0 / 6,724,374.2**

Figure 3. View of the plain with the ruins of Ø97/Qinqua seen towards the south (photo: C.K. Madsen 2016).

Earlier surveys: Nørlund 1932, Vebæk 1945, Bak 1976, 1969

Site Description and Summary: about 1 km up the river (Uunartup Qinnguata Kuua) at the head of the Uunartoq Fjord, the valley opens onto a small floodplain with fairly lush slopes on both sides (of the river). Especially along the river banks where the soils are enunciated is a rich vegetation of natural grasses/sedges. The dwelling sits on a slight elevation bordered by meadow/mire on the northern side of the river, the 9 other ruins are found up the slope in the shrub, as well as on the south side of the river just in the edge of the shrub.

Survey summary: the survey and sampling of the site lasted 4-5 hours, about 1 hour of which were used on the search for new ruins. However, only the north side of the river was surveyed more systematically. Several ruins/features could still hide in the shrub on the slopes on both sides of the river.

Midden coring: Systematic coring and a 100 x 100 cm trench revealed a midden that was between 10-40 cm thick. The preservation was poor and the midden material was mixed and contained charcoal (1%). Above the trench was a mixed turf and stone collapse that was between 20-50cm. No future midden excavation for zooarchaeological analysis is recommended at this site.

Homefield sampling: Three 40x40 cm test pits were excavated and sampled in the homefield north of the dwelling (R06).

Ø134 (60V2-III-515) - Illorsuit NKAH 3510

Large (dispersed) farmstead (34 Norse features). **UTM 23N 486,211.0 / 6,678,415.5**

Figure 4. View of the plain with the ruins of Ø134/Illorsuit seen towards the east south east (photo: C.K. Madsen 2016).

Earlier surveys: Graah 1828, Kielsen 1835, Nørlund 1921, Bak 1968

Site Description and Summary: On the southern side on the large island Sermersooq is a wide, but exposed bay from where a wide plain stretch inland, only rising from shore very gently. As the beach faces directly towards the open ocean, it is highly exposed to the storms and swells of the Atlantic and the bay will clock with summer drift ice. As a result, however, quite a bit of driftwood gets washed up on the beach and may have been a valuable resource of this farmstead.

The Norse ruins and small homefield area are located on the lower part of the plain nearest the beach, almost lying in two-three lines parallel to the beach. Most of the plain occupied by the ruins is dry and only inundated by a few minor streams, most of which had dried out upon our visit. However, east of the site is a single larger stream that drains a small lake 2.2 km to the NW. On the banks of this stream and around the lake is a quite extensive meadow/mire, which must have been the important home pastures of the farmstead. A narrow valley NW of the site (not visited) appears to present quite extensive areas of meadow/mire, but otherwise the vegetation is today rather poor.

Survey summary: the survey and sampling of the site lasted about 7 hours. However, because of the large number of features to be surveyed, only about 45 min was spent searching for new ruins and only in the terrain immediately surrounding the main cluster of ruins.

Midden coring: Systematic coring and a 100 x 100cm trench revealed a midden that was between 10-40 cm thick. The preservation was poor and the midden material was mixed and contained charcoal (1%). Above the trench was a mixed turf and stone collapse that was between 20-50cm. No future midden excavation for zooarchaeological analysis is recommended at this site.

Homefield sampling: Four 40x40 cm test pits were excavated and sampled in the homefield northwest of the dwelling (R18).

Ø153 (60V2-III-515) - Niaqornaarsuk NKAH 3773

Mediun farmstead (10 Norse features). UTM 23N 487.400,4 / 6.710.984,7

Figure 5. View of the plain with the ruins of Ø153 seen towards the southwest (photo: C.K. Madsen 2016).

Ø153 was surveyed in 2015 (see report), but revisited in 2016 to obtain located the midden, as well as to transect the homefield area for samples.

Midden coring: Systematic coring and a 100 x 100cm trench revealed a midden that was between 10-15 cm thick. The preservation was poor and the midden material was mixed and contained charcoal (1-2%). No future midden excavation for zooarchaeological analysis is recommended at this site.

Homefield sampling: Three 40x40 cm test pits were excavated and sampled in the homefield south of the dwelling (R18).

Ø306 (60V2-0IV-516) - Henrik Lundip Qoorua NKAH 3787

Hunting station (1-2 Norse features). **UTM 23N 500,417.1 / 6,729,168.0**

Figure 6. View of the boulder on which sides the ruins of Ø306 are located, seen towards the northwest (photo: C.K. Madsen 2016).

Earlier surveys: Bak 1969

Site Description and Summary: around 7 km up into the valley of Henrik Lundip Qoorua, the river in the valley floor bends northwards and, together with edge of the talus slope, creates a natural funnel in the landscape. The ruin is located by a boulder on the NE edge of this funnel with a decent view of the valley plain as in broadens out further to the northeast. The surrounding vegetation is rather sparse, shrub and dwarf shrub heath. Most likely, this was a small site for hunting caribou, an interpretation that is supported by the presence of two Inuit rock shelters on each side of the funnel and the Norse site.

Survey summary: Because we had some trouble locating Ø306 and were pressed for time because we had to make it back down the valley, we spent less than an hour surveying the site and very little time was used searching for additional features than the ones already recorded, but could easily hide in between the stones on the edge of the talus slope.

Midden coring: No midden observed.

Homefield sampling: A single 40x40 cm test pit revealed no cultural deposits or disturbance.

Ø307 (60V2-0IV-515) - Henrik Lundip Qoorua NKAH 3786

Shieling (1 Norse feature) **UTM 23N 500,417.1 / 6,729,168.0**

Figure 7. View towards the small rocky ridge with the ruin of Ø307 seen towards the south (photo: C.K. Madsen 2016).

Earlier surveys: Bak 1969

Site Description and Summary: some 6 km up the valley of Henrik Lundip Qoorua a low, drained and rocky ridge runs parallel with the river surrounded by more wet and lush vegetation. Partly exploiting natural boulders and a steep cliff side, the single ruin of Ø307 is found on the west side of the ridge. This shieling is undoubtedly a rétt (gathering fold) belonging to Ø97.

Survey summary: Because we had some trouble locating Ø306 and were pressed for time because we had to make it back down the valley, we spent less than an hour surveying the site and no time was used searching for additional features than the one already recorded. Other feature could hide in the area, and in fact Bak does mention some smaller possible features by the river.

Midden coring: No midden observed.

Homefield sampling: A single 40x40 cm test pit revealed no cultural deposits or disturbance.

Ø316 (60V2-0IV-501) - Nulluartup tasia NKAH 3772

Shieling (2 Norse features) **UTM 23N 489,821.5 / 6,712,005.1**

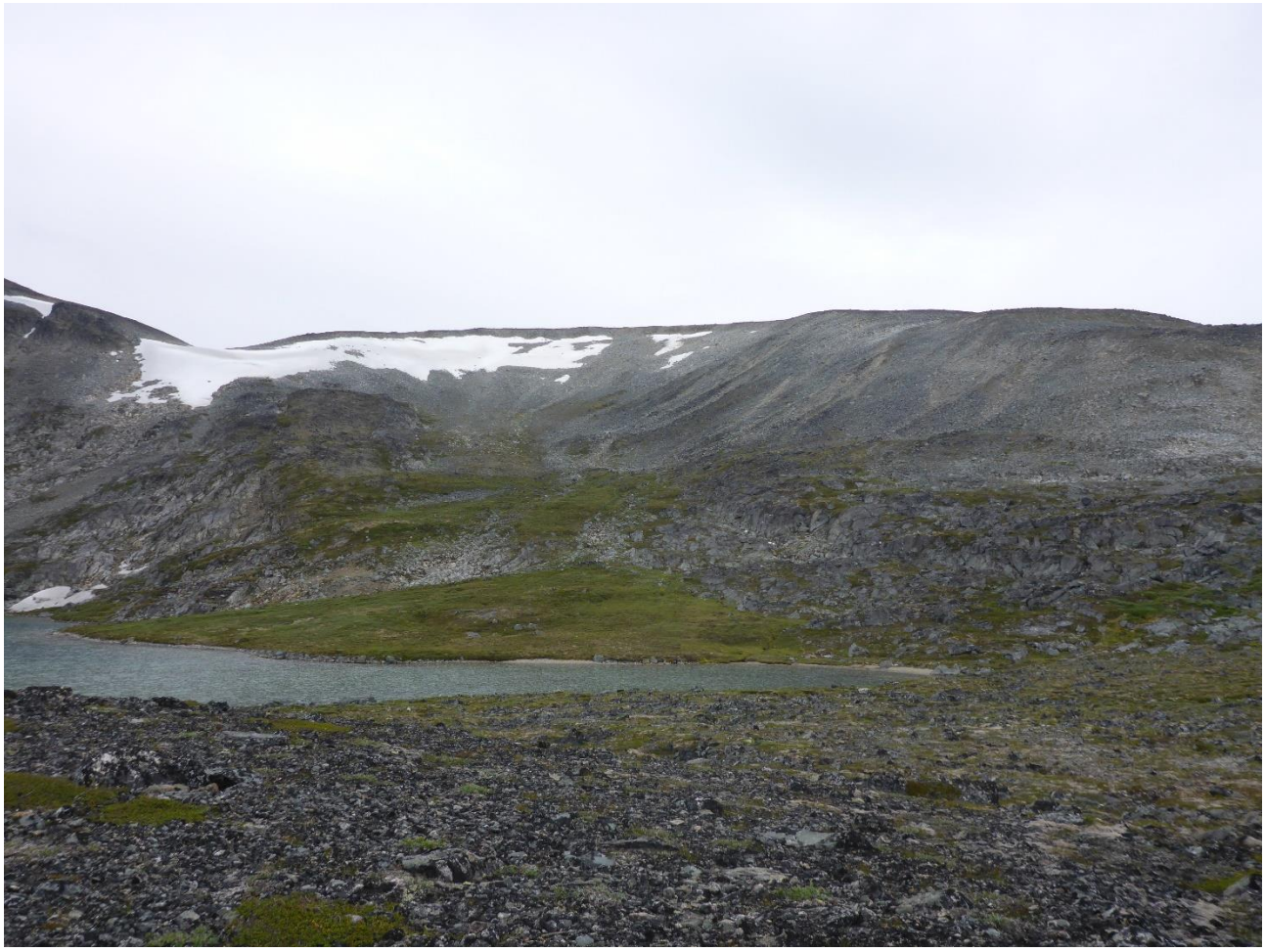

Figure 8. View towards the alluvial fan just north of the slope with ruins of Ø316 seen towards the east (photo: C.K. Madsen 2016).

Earlier surveys: Bak 1968

Site Description and Summary: some 2.6 km ENE of the farmstead Ø153 ENE and straight up the slope of the mountain Nulluartoq is a small lake that collects the water from a huge snow drift on the NW side of the mountain peak. Towards the southern end of this small lake is an alluvial fan (Fig.8)–with the only lush patch of vegetation visible today–and just south thereof two ruins. Lying at an altitude of ca. 580masl., Ø316 is one of the highest lying Norse ruin groups ever recorded. It seems an extreme location even for a shieling and considering that the vegetation may have changed since the Middle Ages. The site serves as a warning that other Norse sites may still lay undiscovered at higher altitudes, where archaeologists have seldom done systematic surveys. Ø316 is almost certainly a (dairy) shieling belonging to Ø153.

Survey summary: We spent ca. 1 ½ hours surveying and sampling the site, of which time ½ hour was spent searching for new ruins only around the alluvial fan and the nearby cliffs.

Midden coring: No midden observed.

Homefield sampling: Two 40x40 cm test pit revealed no cultural deposits or disturbance.

Ø343 (60V2-III-518) - Ulamertut NKAH 3430

Shieling (5 Norse features) **UTM 23N 495.924,7/ 6.691.966,9**

Figure 9. View of the small headland with Ø343 seen towards the south southwest (photo: C.K. Madsen 2016).

Earlier surveys: Bak 1967, 1968

Site Description and Summary: towards the southern tip of the island of Ammalortoq and at the foot of the steep sided mountain Portusup Timaata Qaqqaa is a small flattish headland on which are found both Norse and Thule culture features. Small beach with decent landing are found on both sides of this headland, which today boasts only a meager dwarf shrub heath vegetation. A couple of small streams run close to the site, which otherwise appears to be marginal for any type of farming or grazing.

Survey summary: We used ca. 1 ½ hours surveying and sampling the site, about 45 min of which were spent searching for new features. A few new, poorly preserved, sunken features were located. Due to lack of time the Thule culture features at the site were not DGPS-surveyed, but they were photo documented with drone.

Midden coring: Systematic coring and a 30 x 30 cm trench revealed no midden around the interpreted dwelling feature. No future midden excavation for zooarchaeological analysis is recommended at this site.

Homefield sampling: Two 40x40 cm test pits revealed slight traces of a slight cultural layer with charcoal.

Ø344 (60V2-III-514) - Ikaarissat NKAH 3426

Shieling (2 Norse features) **UTM 23N 489.607,6/ 6.679.552,4**

Figure 10. View of the coast with Ø344 seen towards the southeast (photo: C.K. Madsen 2016).

Earlier surveys: Bak 1968, 1971

Site Description and Summary: At Ikaarissat on the middle eastern side of Sermersooq, the coast nearest the fjord is steep with poor landing options, but also reasonably lush. A number of Thule culture features occupies this slope. Above them are two terraces interspaced by a rocky slope. The Norse ruins are found on the first terrace, several Thule culture graves on the rocky slope. Ø343 is undoubtedly a small shieling belonging to Ø134 and could–beside the medium quality pasture land in the nearby environs–be related to marine resources.

Survey summary: We used ca. 1 ½ hours surveying and sampling the site, about 45 min of which were spent searching for new features. Due to lack of time the Thule culture features at the site were not DGPS-surveyed, but they were photo documented with drone. Thule graves and caches were point surveyed.

Midden coring: Systematic coring and a 30 x 30 cm trench revealed no midden around the interpreted dwelling. No future midden excavation for zooarchaeological analysis is recommended at this site.

Homefield sampling: Two 40x40 cm test pits revealed a slight cultural deposit with of charcoal.

Ø345 (60V2-III-516) - Inussuerneq NKAH 3428

Shieling (6 Norse features) **UTM 23N 483.396,9/ 6.675.861,9**

Figure 11. View of the plain with Ø345 seen towards the southeast (photo: C.K. Madsen 2016).

Earlier surveys: Bak 1968

Site Description and Summary: Towards the southern tip of Sermersooq, a small valley cuts into the island's central mountain chain. Ø345 is located at the mouth of the valley and quite close to the fjord, where there is a somewhat lush plain. Just in front of the site, a small rocky outcrop juts out into the fjord creating a natural wave breaker and reasonable landing for a boat. Ø345 was probably a small dairy shieling belonging to Ø134 and meant to facilitate the pasturing of animals along the lower mountain slope and up the small valley above the site. However, marine mammals also pass close by the site and the site could alternatively have worked as a hunting or scouting station.

Survey summary: We used ca. 2 hours surveying and sampling the site, about 45 minutes of which were spent on searching for new features, although none were located. Only the terrain immediately surrounding the site were surveyed and we did not go up into the valley above the site.

Midden coring: Systematic coring and a 30 x 30 cm trench revealed no midden around the interpreted dwelling. No future midden excavation for zooarchaeological analysis is recommended at this site.

Homefield sampling: a single 40x40 cm test pit revealed a slight cultural deposit with of charcoal.

Ø346 (60V2-III-517) - Atikerleq NKAH 3429

Shieling (3 Norse features) **UTM 23N 482.554,3/ 6.675.002,3**

Figure 12. View of the plain with Ø345 seen towards the south southeast (photo: C.K. Madsen 2016).

Earlier surveys: Bak 1968

Site Description and Summary: Towards the southern tip of Sermersooq, a valley cuts across the island's central mountain chain. Ø345 is located just north of the eastern mouth of this valley on a completely dwarf shrub heath dominated plain littered with boulders. It appears to be a small dairy shieling, surely belonging to Ø134. The site may also be related to the use of the nearby valley across Sermersooq.

Survey summary: We used ca. 1 ½ hours surveying and sampling the site, about 45 min of which were spent searching for new features, a single new ruin being recorded.

Midden coring: Systematic coring and a 30 x 30 cm trench revealed no midden around the interpreted dwelling. No future midden excavation for zooarchaeological analysis is recommended at this site.

Homefield sampling: Two excavated 40x40 cm test pits revealed a slight cultural deposit with charcoal.

1601 – Kangeq NKAH 4468

Hunting station (1 Norse feature) **UTM 23N 482.554,3/ 6.675.002,3**

Figure 13. View of the plain with Ø1601 seen towards the south southeast (photo: C.K. Madsen 2016).

Earlier surveys: Raahauge et al. 2001

Site Description and Summary: Just off the coast of the southern tip of the island of Sermersooq are a few islets and behind them, a beautifully sheltered inlet. Just up the stone beach from the inlet are several Thule culture winter features surrounded by thick midden deposits, as well as more recent and still functioning hunter's cabins. Historically, and still, this is a popular hunting site for the migrating hooded seal. Some 300 m ENE of this hunting settlement lies the single Norse ruin, apparently some kind of dwelling with well-defined rooms. This is a atypical feature for a shieling and neither does the surroundings suggest any significant farming activities could have taken place there. This combined with setting near the marine hunting grounds could suggest that 1601 is a marine hunting station?

Survey summary: We used ca. 2 ½ hours surveying and sampling the site, about 1 hour of which were spent searching for new Norse features, but not finding any. However, on the edge and the lower part of the talus slope are a few Thule culture rock burials that are all empty (not surveyed). It is quite likely that additional Norse features could have been placed down by the inlet and have been disturbed by later building activities. 3 small possible Norse features (nos. 5-7) located by Raahauge et al. (2001) were not revisited.

Midden coring: Systematic coring and a 30 x 30 cm trench revealed no midden around the interpreted dwelling. No future midden excavation for zooarchaeological analysis is recommended at this site.

Homefield sampling: Two excavated 40x40 cm test pits revealed a slight cultural deposit with charcoal.

1602 – Uunartup Qinnqua

Shieling (2 Norse features) **UTM 23N 495.629,5/ 6.727.455,9**

Figure 14. View of the larger ruin at 1602 seen towards the south (photo: C.K. Madsen 2016).

Earlier surveys: Bak 1968

Site Description and Summary: At the head of the Uunartoq fjord, just a little from the northern side of mouth of the river Uunartup Qinnguata Kuua and close to the shore are the two ruins identified. They appear to represent a small milking station, undoubtedly belonging to Ø97.

Survey summary: Ca. 45 min were used surveying the site.

Midden coring: No midden observed.

Homefield sampling: No homefield observed.

1603 – Henrik Lundip Qoorua

Thule culture caribou drive **UTM 23N 498.752,5 / 6.727.455,9**

Figure 15. View of the larger ruin at 1602 seen towards the south (photo: C.K. Madsen 2016).

Earlier surveys: N/A

Site Description and Summary: Some 4.8 km up the valley Henrik Lundip Qoorua and ca. 100 m up its northern talus slopes, a small shallow ravine cuts through boulders. Exploiting this ravine by barring its one end and piling up stones to form a low stone wall that runs up slope on its southern side, is small caribou drive. 2-3 three shooting blinds seem to have built into the drive: two on each side of the lower end of the ravine and one at the higher end. However, the latter end has also been disturbed by recent erosion and the system could have continued up the slope. The lower end also seems partially disturbed and part of the walls trails off. Surely, the drive system must be related to the massive tent foundations that are found in the end of the valley by Ø97, i.e. it represents communal caribou hunting in the valley.

Survey summary: Because we were already running very late in our rendezvous with the boat, only ca. 30 minutes were used to survey and describe the ruin.

Midden coring: No midden observed.

Homefield sampling: No homefield observed.

CIE & WiCP Conclusion and Perspectives

2016 was the last official year of the field work relating to the Greenland part of the CIE (a short follow-up survey is planned for the summer 2017 in collaboration between CIE & WiCP). While the data and samples collected since 2013 still awaits detailed analysis, some preliminary results from the study area can be outlined:

Site Surveys and Homefield Sampling Summary Results: In 2016 13 sites were visited and surveyed, resulting in 67 Norse and 23 Inuit ruins being documented in detail. Although the data is still being analyzed, some overall conclusions and perspectives from the field seasons 2013-2016 can be summarized. Having completed the survey of a transect between Narnortalik and Uunartoq, we confirm the presence of a complex, agriculture based, Norse settlement in the outer fjord region of the Eastern Settlement.

i. The general organisational pattern in the environs of the study area is of large church farms with satellite middle sized farms and shielings (for fodder, milking and for marine resource hunting). The size of the church farms, (based on number and size of buildings) is out of proportion to its immediate land resource base (based on the extent of podsol soils amended with varying proportions of turf / manure and domestic waste for nutrient and water balance requirements, and of wetland meadow). This indicates a fodder provisioning reliance of the middle sized farms which have an immediate land resource base beyond likely requirements.

ii. Across the study area we have identified 'mega – specialised' farms associated with a contrasting but extensive land resource base. With no associated satellite farms these appear to be independent of the large farm – satellite farm system.

iii. In Nanortalik and environs land organisation is simpler with independent middle sized farms with shielings and a balanced land resource base (based on the 2014 survey).

iv. We identified a possible early Thule culture site in the homefield area of Ø130, and which makes it similar to the Sandhavn site (Golding et al., 2011, 2015). If dating and structural analyses confirms our field observations we open further the possibility of Norse – Inuit interaction on the outer fjords. Radiocarbon dates on birch charcoal indicate activity between 1300 and 1400 AD.

v. Landnám is clearly phased with early sites from the 10th century but with start-up sites in the 11th century – including the specialised farms - and even into the 13th century. Middens are generally a later start, from the 12th century onward.

There are key elements of these systems that we have yet to fully understand and which require further consideration:

vi. The seasonal patterns of use in contrasting shielings. We can address this through keyhole excavation, micromorphology and dating of occupation surfaces and which will establish function and intensity of use.

vii. Wet meadow fodder resources are now clearly a major aspect in the location, sustainability and resilience of these farming systems. We have no understanding of their formation and productivity – some are natural and were formed before Landnám; others appear to have formed after Landnám as a result of changing water balances in the new cultural environment or as a result of deliberate wetting.

viii. We have identified shillings that potentially are related to wild resources – inland and marine – but will need to sample these sites to confirm the interpretation.

We have little understanding of archaeological site formation in the outer fjords. To address this and give better archaeological contextualisation to our land organisation and management survey we advocate excavation of a 'typic' outer fjord settlement site. A short 2017 field season is planned to wrap up the surveys of the sites in the Uunartoq fjord and the island of Sermersoq, which will conclude the CIE field work.

Midden Coring Summary Results: all Norse sites in the study area with an observed midden (as well as many sites with no apparent midden) were cored to estimate the presence, depth and extent of cultural deposits. However, only at two sites–Ø130 and Ø318–have we observed what appears to be excellent (water-logged) preservation conditions. Two other sites–Ø128 and Ø135–display some midden depth and preservation, but the results from the test trenching are inconclusive. Otherwise, middens across the study area are generally very shallow with poor preservation. The first condition should likely be interpreted in terms of farming (manuring) practices and/or farming intensity (time-depth), although we are not resolved on this issue. The second condition is likely a consequence of both the midden thickness and the global warming trend, supporting what we have been observing during the last decade of midden observation, i.e. that in most place preservation has almost completely gone. However, most midden test excavated have yielded samples for 14C dating that will now be analyzed.

CIE Project Perspectives: Following the planned 2017 field season, we will begin the final processing and analysis of the data to be published in international journals. However, a full report summarizing and presenting the field campaigns, data, and dates will be compiled by 2018. Open conclusion of the project, all survey data, documentation and dates will be sent to the NKA.

Annex 1. Homefield samples list

Site	Charcoal sample material	Charcoal taxa and weight
Ø16-01 (Thule Site)	C1 [002] sample 1	*Betula* sp (0.03g)* Ericales (3 fragments – 0.06g)
	C1 [002] sample 2	Coniferales (0.02g) Coniferales (0.02g) Coniferales (0.01g)
	C2 [002] sample 1	cf *Abies* sp (0.11g) Coniferales (0.03g) Coniferales (0.02g)
	C2 [002] sample 2	cf *Picea* sp wood (0.16g) cf *Picea* sp wood (0.14g) cf *Picea* sp wood (0.04g)
Ø97 (Farm – Homefield)	Anthrosol upper	No charcoal
	Anthrosol mid	*Salix* sp (0.01g) *Betula* sp (0.01g)*
	Anthrosol lower	*Betula* sp (0.01g)*
	Landnám lower	*Betula* sp (<0.01g)
	Landnám 1 lower	No charcoal
	Landnám 2 lower	*Betula* sp (0.02g)* *Betula* sp (0.01g) *Betula* sp (0.01g)
	Landnám 3 upper	*Betula* sp (0.01g) *Betula* sp (0.01g)
Ø97 (Farm – Midden)	[02]	*Betula* sp (0.02g)* *Betula* sp (0.02g) *Salix* sp (0.03g) *Salix* sp (0.02g)
	[03]	*Betula* sp (0.13g)* *Betula* sp (0.02g) *Salix* sp (0.09g) *Salix* sp (0.05g)
	[04]	*Betula* sp (0.02g)* *Betula* sp (0.02g) *Betula* sp (0.01g)
	[05]	*Betula* sp (0.01g)* *Betula* sp (0.01g) *Betula* sp (0.01g) Coniferales (0.01g)
Ø134 (Farm – Homefield)	Profile 4: A Horizon upper	No charcoal
	Profile 4: A Horizon lower	*Picea/Abies* (0.04g) *Betula* sp (0.06g)* Coniferales (0.02g)
	Profile 4: A-B Boundary	*Betula* sp (<0.01g)*
	Profile 3: Bulk Horizon 1	No charcoal
	Profile 3: Charcoal 1	Fucoid seaweed (<0.01g)

Ø134 (Farm – Midden)	[03] top Sample 1	Fucoid seaweed (0.03g)
	[03] bottom Sample 2	Ericales (0.02g)
Ø153 (Farm – Midden)	[02] upper	*Betula* sp (0.10g)* *Betula* sp (0.07g) *Betula* sp (0.06g)
	[02] lower	*Betula* sp (0.02g)* *Betula* sp (0.02g) *Salix* sp (0.02g)
	[03] Landnám	cf Fucoid seaweed 3 fragments – 0.01g)
	[03] Landnám – Fe	No charcoal
Ø306 (Inland station)	Feature 1: Bone	No charcoal Bone (bone id required)*
Ø316 (Shieling)	Charcoal 1	No charcoal
	Charcoal 2	No charcoal
Ø343 (Shieling)	Structure 1	Ericales (0.01g)
	Structure 2	Ericales (0.03g)
	Offsite	*Betula* sp (0.03g)*
Ø344 (Shieling)	Charcoal 1	Indet charcoal (0.02g)* Indet charcoal (0.01g)
Ø345 (Shieling)	Charcoal 1	*Betula* sp (0.05g)* *Betula* sp (0.03g)
Ø346 (Shieling)	Charcoal 1	No charcoal
	Charcoal 2 (collapse material)	*Betula* sp (0.02g)*