

REPORT OF THE THIRD IOSF STUDENT RESEARCH GRANT PROJECT:

OTTER SURVEY OF NORTH UIST, 8-20 SEPTEMBER 2024

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Abstract

This was the third Student Research Grant project to be carried out, in order to encourage students into field research of otters. For this year's project the otter survey was conducted on North Uist. The majority of spraint sites were found on exposed coastal areas, however most of fresh spraint deposits from this survey were recorded on the sheltered coasts. A high number of spraints occurred on a small offshore island. Although this affected the results from the immediate surroundings, the overall data from the habitat category that it belonged to was not distorted. During this survey sightings of otters only occurred on the northeastern parts of North Uist. Many small fish were eaten by the otters in the water, with pipefish, 15-spined stickleback and butterflyfish identified as the fish caught. The IOSF had also conducted a survey on North Uist eighteen years prior. It was found that although there were some differences between these two surveys, overall the results were very similar.

Keywords: *Lutra lutra; North Uist; Outer Hebrides; spraints*

INTRODUCTION

In the summer of 2022, the IOSF launched the first Student Research Grant project on the Isle of Barra (**Rothwell, 2023**). The aim was to provide sponsorship open to undergraduates. It was designed to help and encourage students into field research on otter ecology. Following on from the success of this and the subsequent second project on the Isle of Benbecula (**Rothwell, 2024**), a third Student Research Grant was set up, with North Uist as the study location. Two student placements (*Mia Gleave* from Bangor University, and *Alfie Davis* from Plymouth University) were chosen via an application and interview process, to carry out an otter survey under the guidance of a professional zoological surveyor (*Andrew Rothwell*), on the island of North Uist, during September 2024.



Figure 1. Map of Scotland showing location of North Uist.

North Uist lies roughly in the middle of the Outer Hebrides or Western Isles archipelago (Figure 1). It is the third largest island in this cluster, approximately 29km x 20km and is formed from Lewisian Gneiss (the oldest rocks in Britain). The coastline is dominated by rocky headlands throughout, with a notable expanse of sandy beaches in the north and southwest coasts. The island is very flat, and covered with a patchwork of peat bogs, and a complex maze of lochans (both sea and freshwater). On the south coast is a large expanse of tidal mudflats/sand, which connects North Uist with Benbecula, and is directly linked (via Grimsay) by a causeway.

Retrospectively, the IOSF had conducted an otter survey on North Uist back in 2007 (Yoxon and Yoxon, 2007), with a small group of dedicated volunteers. Together they surveyed approximately 46km of rocky coastline on the island, with the addition of a negligible amount associated with the freshwater habitats.

The results of the Student Research Grant project are outlined in this report, and compared with the data from the 2007 survey, to see if there have been any noticeable changes in otter activity on the island over the years.

METHODS

The survey primarily involved walking the coastline (roughly 5 to 8km per day, depending on ease of terrain and weather conditions), and recording all field signs found indicating otter activity (Figure 2).



Figure 2. Mia Gleave and Alfie Davis recording field signs on the east coast of North Uist.

In addition, any otter sightings were recorded by scanning the field of view with binoculars, in between looking for secondary signs (Figure 3).



Figure 3. Mia Gleave and Alfie Davis looking out for otters on the east coast of North Uist.

The field signs recorded included:

- **SPRAINTS** (otter faeces);
- **SPRAINT SITES** (spraints are principally deposited at regularly visited areas within an otter's territory, and are usually located on prominent features such as grass tufts, rocks, and areas where there is cover, for example under bridges) (**Chanin, 1985; Mason and Macdonald, 1986**);
- **FOOTPRINTS** (Otters have five toes and webbed feet. However, the smallest toe does not often make a mark resulting in a typical "*four-toed*" print. Such prints tend to be lopsided and can be distinguished from the more symmetrical dog or fox prints);
- **REST-SITES and HOLTS** (areas utilised by otters for sleeping or resting).

The structure of a rest-site can vary depending on the geographical resources present (as does the terminology used to describe such areas), whether it is an underground den or a temporary resting place above ground. They can range from substantial piles of branches/logs, dug burrows, dense scrub or amongst rocks and boulders. The lair of an otter is commonly referred to as a holt and these are considered as the main resting sites within an otter's homerange.

Otters may also use temporary and much smaller resting places, often referred to as a "lie up" "hover" or "couch". Such rest-sites can also be found in a variety of places, for example under dense scrub, small rocky outcrops and simply amongst grass or sedge tussocks.

For the purpose of this survey, a holt was defined as a substantial burrow system, or any natural crevice and boulder matrix, with lots of signs indicative of regular use by otters and with more than one entrance. All other small shelters above ground deemed to be utilised by otters were categorised as rest sites.

Several geographical zones exist on North Uist, and the island was divided into three main categories: namely *Exposed Coast*, *Sheltered Coast*, and *Freshwater Lochs (and Burns)*. Each of these zones were further divided into sub-categories based around geographical orientation (Table 1).

Table 1. Number of spraint sites and total spraints found within each different survey zone investigated on North Uist, September 2024.

<i>Habitat (Distance surveyed)</i>	Spraint Sites	Spraints	Fresh	Recent	Old	Gel
Coastal (45km)	329	1040	160	363	489	28
Freshwater (16km)	96	205	20	85	93	7

<i>Habitat – Geographical Zone</i>	Spraint Sites	Spraints	Fresh	Recent	Old	Gel
<i>Sheltered sea loch (north coast)</i>	9	32	12	16	2	2
<i>Sheltered sea loch (east coast)</i>	63	224	61	69	89	5
<i>Sheltered sea loch (south coast)</i>	46	152	11	58	83	0
<i>Exposed north coast</i>	15	49	8	15	20	6
<i>Exposed north coast/machair</i>	62	230	24	100	105	1
<i>Exposed northeast coast</i>	47	127	28	53	38	8
<i>Exposed sea loch (northeast coast)</i>	3	6	0	0	6	0
<i>Exposed sea loch (east coast)</i>	20	48	5	19	22	2
<i>Exposed west coast</i>	33	109	11	24	72	2
<i>Exposed west coast/machair</i>	31	63	0	9	52	2
<i>Freshwater burn (north central)</i>	10	14	3	5	5	1
<i>Freshwater burn (east coast)</i>	10	19	1	12	6	0
<i>Freshwater burn (south coast)</i>	10	37	2	21	14	0
<i>Freshwater burn (west coast)</i>	5	10	4	1	5	0
<i>Freshwater loch (north coast)</i>	20	43	7	13	19	4
<i>Freshwater loch (east coast)</i>	7	18	2	6	9	1
<i>Freshwater loch (south coast)</i>	19	43	1	26	15	1
<i>Freshwater loch (west coast)</i>	15	21	0	1	20	0
<i>Totals</i>	425	1245	180	448	582	35

The survey was conducted on a mixture of habitat types, within each of the main zones across the island, thus giving a variety of environments for the students to work in.

The students logged and collected spraints, which were analysed separately as part of their own personal study parameters.

Note: Not all spraints found were collected, as it is important not to remove them all during survey work. This is because spraints contain various scent chemicals, which otters use to communicate with each other.

RESULTS

Whilst there were only a couple of days of poor weather, the rest of the survey was conducted during fair to favourable conditions.

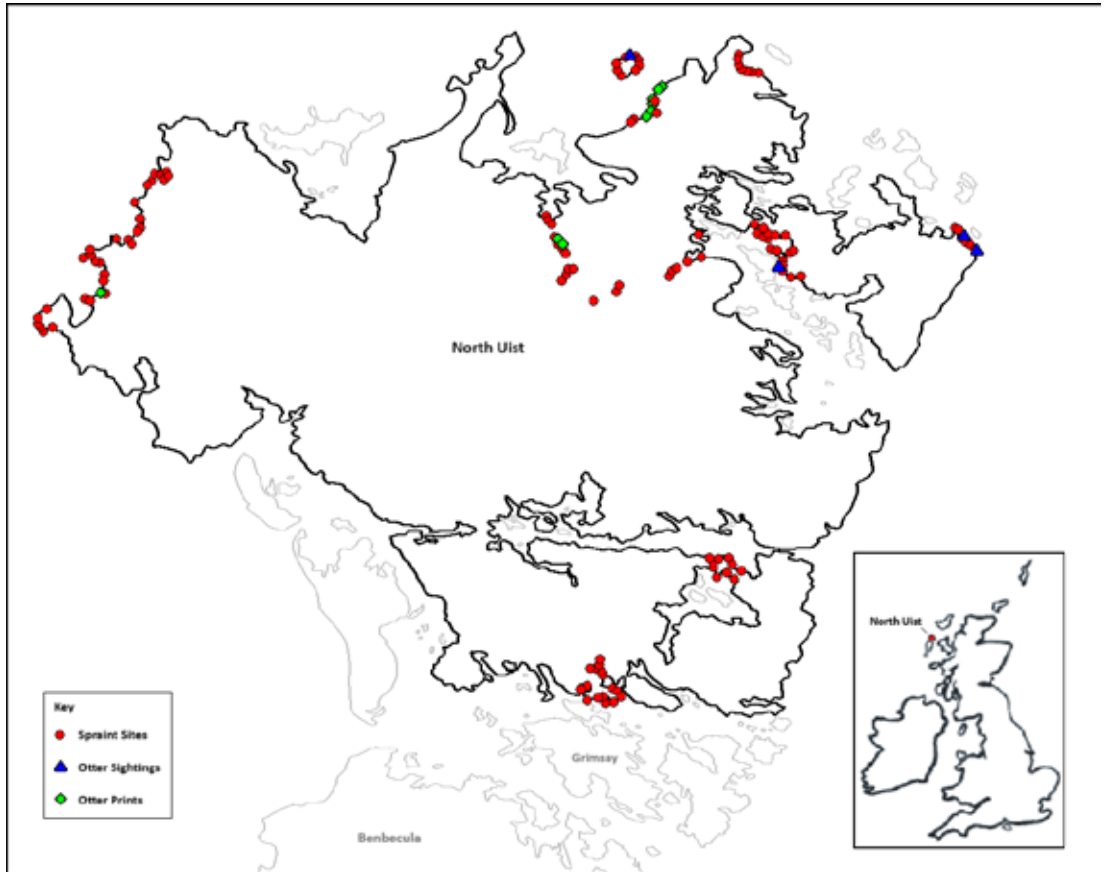


Figure 4. Location of study area, showing field signs of otter activity found during a survey on North Uist, September 2024.

The students surveyed approximately 61km of linear habitat, comprised of 45km on coastal areas and 16km in freshwater environments. A total of 1,245 spraints were recorded, over 425 spraint sites. Most of the spraints were found in the coastal environments, in contrast to the freshwater habitats; with more spraints recorded on the exposed rocky shores, compared to the sheltered coastlines (Table 1 and Figure 5).

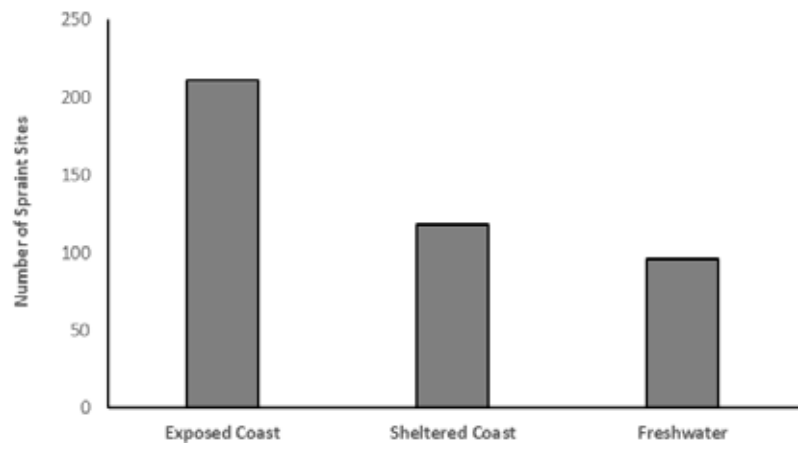


Figure 5. *Number of spraints sites found within the three main habitat types surveyed on North Uist, September 2024.*

A disproportionately high percentage of spraints were found on Lingeigh, a small offshore island (about 3km in circumference), on the exposed north coast machair, at Tràigh Lingeigh (Lingay Strand). The machair is a distinctive sand dune formation with a high shell content, which is blown on to a low-lying coastal plain by the westerly winds that prevail in the north and west of Scotland. The machair accounted for 34% of the total spraints recorded on all the exposed coastlines surveyed and 94% of all the spraints found within the exposed north coast/machair habitat.

Four sightings of otters occurred on the northeastern part of the island (Figure 4). During the afternoon of the fifth day, two otters, of similar size, were seen swimming and foraging together, on the east coast among the sheltered sea lochs, travelling from Loch Siginis into Loch Dheoir. They came unexpectedly round the corner from the southeast, to where the students were documenting some spraint sites! This encounter occurred very close to the shoreline, and we were all surprised that the otters did not do their usual disappearing act as soon as they saw us. When both otters were under the water, we jostled for a more comfortable position to watch the spectacle. Whilst one of the otters continued to fish, the other otter was more wary of us, and hung back motionless in the water watching us. This otter soon disappeared, whilst the unperturbed otter, made several successful dives, eating small fish in the water (pipefish, 15-spined stickleback and butterfish were recognised as the prey items). After a short hunting spree in front of us (Figure 6), the otter then headed northwestward around the corner of the neighbouring island and out of sight!

The following day, we moved to a different part of the island, on the exposed northeast coast, at Ceann a’ Mhuir near Crògearraidh na Thobha. This coastline overlooks The Little Minch, which is the sea in between the Isle of Skye and the Uists. During the late morning, an otter was seen swimming towards the shore. Once landed, it had a long rolling and grooming session on the seaweed covered rocks.



Figure 6. Otter foraging on the northeast coast of North Uist

Occasionally it was heard briefly whistling. After the grooming session, it walked up to the highest point to spraint, and then walked back down to the sea, dived in, resurfaced and ate a small fish in the water. It dived back down, popped up, then caught sight of us, at which point it disappeared! Later in the early afternoon, an otter was spotted foraging in the swell, less than a kilometre away from the first sighting of the day; a gannet and a seal were also hunting here. The otter made several dives and ate small fish in the water (seen five more times). It continued diving, and after a short while it swam around the coast northwards, out of sight. It was assumed to be the same otter observed in the morning. However, it could have been a second otter which we had not seen, and it was this otter which the first one was calling to.

Towards the end of the survey period, a large otter was seen on Lingeigh. The otter was briefly observed walking up the shore to the grassy headland, but then spotted us and scrambled down through the rocky shore. It was seen shortly after, swimming in the kelp bed, pausing to look at us, and then disappeared out of sight!

Several well used regular runs radiated out from a couple of focal points on the northeast coast of Lingeigh, heading around the perimeter of the headland, leading



Figure 7. Otter runs on the northeast coast of Lingeigh.

out to sea (Figure 7). Runs were also going inland towards a series of small bog pools/lochans. Many spraint sites were found along these trails.

Six holts were recorded and these were each associated with burrows in the peat banks. Three sites were found on the exposed north coast, two on a sheltered sea loch on the east coast, and one on a freshwater loch on the south coast. All of the holts were categorised as active, with most of them having fresh or recent spraints deposited outside the entrance; however, one holt on the east coast only had one spraint outside an entrance.

There are a vast array of suitable habitat features on North Uist, which could be utilised as rest sites for an otter. Many spraint sites were associated with peat

bank erosion overhanging tunnels, on sheltered sea lochs of the south and east coasts, and on the exposed north and west coasts of the island. Other features within these geographical zones considered to be rest sites were dense heather and old rabbit burrows. Several fresh and recent spraints were also found under overhanging outcrops on the exposed northeast coast. Whilst many of the rest sites were found in the coastal areas, a couple were recorded in the freshwater habitats, under dense heather/peat bank overhanging a tunnel, on a loch on the north coast, and on a burn on the south coast.

Numerous otter prints at Tràigh Lingeigh were among the other field signs of otter activity noted during the survey. There were five distinct locations along the sands, covering an area of about 1.5km, where tracks were seen to be leading from the sea up into the vast dune system. The trails would often arc in and out of the dunes creating large “u-shapes” all the way along the dune margins, and then return back towards the sea (Figure 8).

Two tracks occurred side-by-side, indicating two otters were traveling together. Furthermore, three separate trails observed next to each other suggests that there was potentially a third otter foraging around the dune system Tràigh Lingeigh?

Despite the expanse of otter trails at Tràigh Lingeigh, only eight spraint sites were found among the dunes. At one particular site, one fresh spraint was deposited on a sand sign heap, at the base of a dune ridge. A sign heap is a structure formed by otters, from scraping substrate or vegetation into a small mound, often placing a spraint on top (Figure 9).

A couple of otter prints were found on the sandy/silt margins of Loch nan Geireann; a large freshwater loch located on the north coast. Similarly, otter prints occurred on the bank margins of an unnamed freshwater burn linking Tràigh Bhàn and Loch na Reivil, on the west coast of North Uist (Figure 4).

DISCUSSION

The majority of otter observations from this survey came from parts of North Uist where most of the spraints were recorded. An obvious fact, perhaps, although spraint distribution did vary according to the habitat type. Most of



Figure 8. Otter tracks along the dunes of Tràigh Lingeigh.



Figure 9. Otter prints and sign heap on the dunes of Tràigh Lingeigh.

the spraint sites occurred on exposed rocky coasts. This was also noticed on surveys conducted on Barra (**Rothwell, 2023**) and Benbecula (**Rothwell, 2024**). Conversely most of the fresh spraints found on North Uist were located on the sheltered sea lochs on the east coast – this was also where two otters were seen forging together.

On reflection of the high level of otter activity (based on the number of field signs) on Lingeigh, the importance of this small offshore island may have skewed the data for the overall exposed coastal zones surveyed. If Lingeigh was removed from the data set for the exposed coast category, the results from this region would still have represented the higher quantity of spraint sites and numbers of spraints found, compared to sheltered coasts and freshwater habitats. Conversely, when considering the direct geographical area that Lingeigh lies in (exposed north coast machair) and not the island itself, would have meant only eight spraint sites were recorded from 3km of coastal dunes, compared to the same distance covered linearly on Lingeigh, where 54 spraint sites were found.

Coastal waters are often very productive, and many support dense populations of fish and invertebrates, particularly in Scotland (**Kruuk, Nolet and French, 1988; Kruuk, 1995**). This therefore makes coastal areas particularly favourable for otters. The dune systems on Tràigh Lingeigh have a very wide sandy intertidal zone and consequently would represent quite an exposed and sub-optimal habitat for foraging otters. These areas are also easily accessible and very popular with people. Whereas the remoteness of Lingeigh island would not only restrict human disturbance, it also provides a more profitable hunting ground for otters, due to its rockier intertidal composition. All these factors contribute to the reasons why otters are utilising the offshore island more than the equivalent in coastal dune habitat. With that said, the dunes were certainly not devoid of otter activity, merely that the number of spraint sites present in this habitat tends to be much reduced. The number of spraints sites found can be very disproportionate to the amount of otter activity, and indeed the number of otters using the same site (**Yoxon and Yoxon, 2014; Rothwell, 2024**).

It is well documented that the distribution of otters is affected by the availability of resources, such as food, shelter, and particularly along sea coasts the presence of freshwater (e.g. **Kruuk and Hewson, 1978; Jenkins and Burrows, 1980; Kruuk and Moorhouse, 1991; Yoxon, 1999**). A freshwater source is very important for an otter living on the coast because seawater will accumulate and reduce the thermo-insulating properties of fur (**Kruuk and Balharry, 1990**); therefore, otters will need to wash regularly and groom out the accumulated salt. It was interesting to note that the spraint distribution recorded from some parts of North Uist occurred in areas where freshwater availability was very limited. This would suggest a compromise between food and resources, particularly on the north and northeastern coasts; additionally, this was also an area where two sightings of an otter foraging occurred (Figure 3).

Some similarities and differences presented themselves when comparing the results of the 2007 volunteer survey of North Uist (**Yoxon and Yoxon, 2007**), with the 2024 student survey in this report. Comparatively, observations of otters from each survey, occurred in separate parts of the island. In 2007 all three sightings of otters happened at Loch Euphort on the southeast coast. During 2024, four sightings took place along the northeastern part of the Island. In both cases, the representative coastal region was also where most spraints were found.

Almost an equal amount of coastal habitat was examined in both surveys. Nevertheless, in total just over twice as many spraint sites were found during 2024 ($n=329$), than in 2007 ($n=138$). More spraint sites were found along the sheltered coasts compared to the exposed rocky shorelines in 2007, while the opposite was observed in 2024.

There was about 13km of the same coastline, which was covered in both surveys. Within this common ground, it was interesting to note the differences in spraint site distribution. On the west coast around Tràigh Bheireal and Cladach Mòr, the majority of spraint sites found were spaced out in roughly similar areas. However, there was about a kilometre on this coastline which in 2007 had slightly more spraint sites evenly spread out; whereas in 2024 this same stretch had a smaller number of spraint sites, in a series of clusters. Furthermore, in 2007 on the northeast coasts at Loch Dheoir, eight sprainting sites were found on a small peninsula, but on the same stretch of coast in 2024 there were no spraint sites found at all. Contrastingly in 2024, around the headland of Aisgernis and into Loch Siginis, 37 spraint sites were found, but none were recorded back in 2007.

CONCLUSIONS

This survey has given two students the opportunity to study a selection of differing habitat types on North Uist, and see how otter utilisation differs across the island. They have observed that most spraint sites could be found on the exposed rocky shore habitats; the importance of an offshore island; otters will still use areas with limited freshwater availability; and whilst spraint site detection can largely be predicted, there are always exceptions to the “rule”. It was also noted that habitat categorisation, and the descriptions of the conditions of the spraints can be very subjective. Mia and Alfie continue with their own analytical studies of the results obtained. They are also working on the spraint analysis of the 344 samples collected, together with what proportion of the observed prey items eaten by the otters in the water are also revealed from the diet analysis. It is hoped that these results will be presented in future journal papers.

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Disclosure

No potential conflict of interest was reported by the author.

Author Biography

Andrew Rothwell is a freelance zoological surveyor, specialising in otter and water vole surveys. With an avid passion for the natural world since childhood, he has continued to be amazed and enchanted by the magic of catching a glimpse of the very charismatic and endearing otter.

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