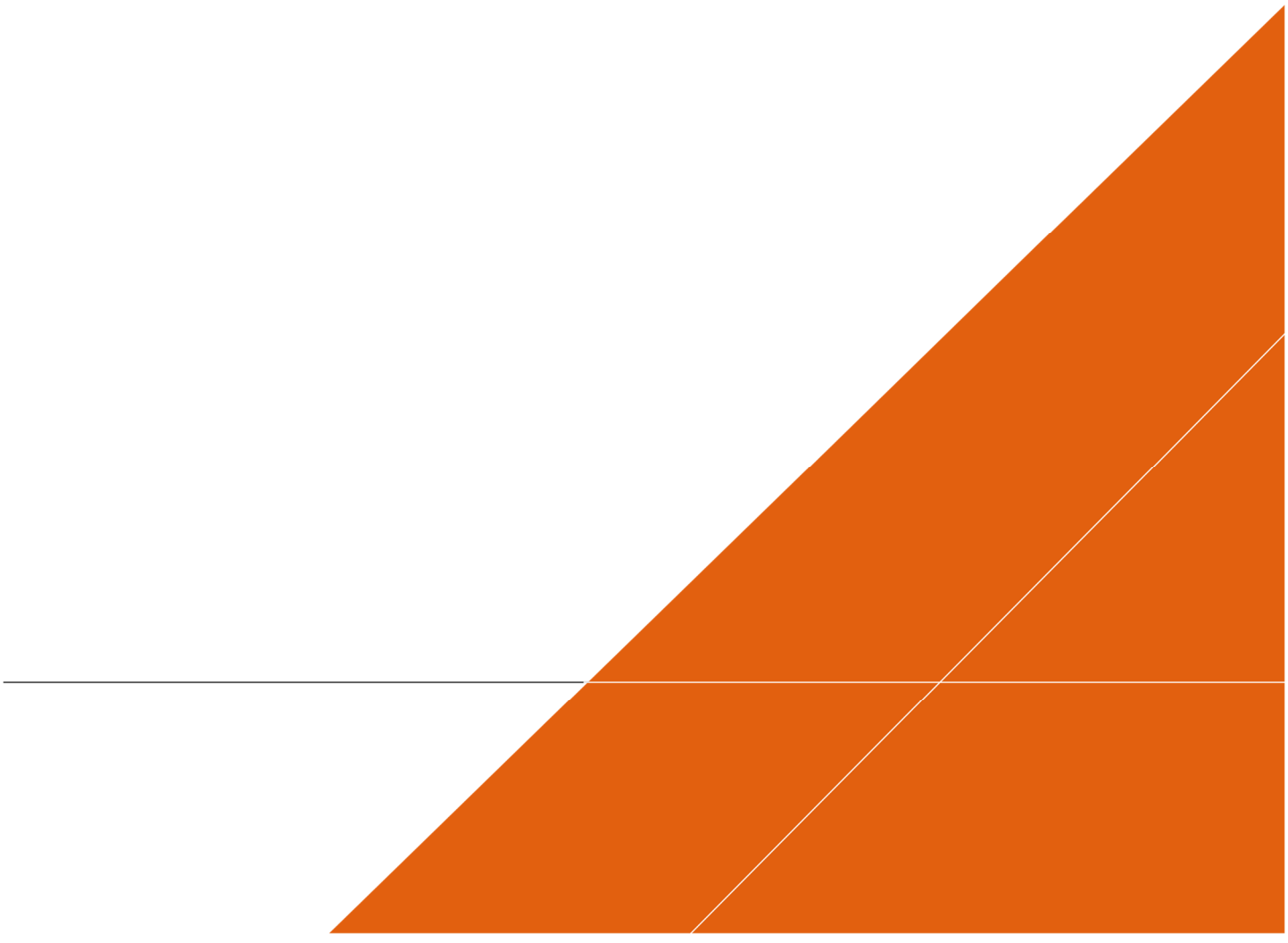
MOJ PROVISION OF ECOLOGICAL CONSULTANCY

Ecological Assessment – HMP Haverigg Back Field

MAY 2019



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1 Summary

Arcadis Consulting (UK) Ltd was commissioned by the Ministry of Justice (MoJ) in December 2018 to undertake ecological assessments of two sites within the MoJ estates cluster that are within or adjacent to Sites of Special Scientific Interest (SSSI), and provide advice on their SSSI status and how to improve them.

This report presents the results of the assessment of HMP Haverigg, which is located 1km to the west of the village of Haverigg in Cumbria. The study area was an area of MoJ-owned land at the prison known as the Back Field ('the site'). The site was adjacent to Duddon Estuary SSSI and Ramsar Site, and Morecambe Bay Special Area of Conservation.

A desk study and ecological survey of the site and the adjacent SSSI sand dunes were carried out in March 2019. The aim was to assess the current ecological value of the site in the context of the adjacent SSSI habitat, and inform the future management of the site for nature conservation.

The following features of ecological interest were recorded:

- Marsh and swamp vegetation with snipe.
- Diverse short vegetation on hardstanding.
- Barn owl hunting over improved grassland.
- Combination of short and tall vegetation suitable for nesting skylark and lapwing.
- Bunds where common lizard were recorded in 2008.
- A pond.

These features were all being adversely affected by the large and increasing area of Bramble scrub.

Overall, the site is considered to be of district / borough importance for biodiversity. Although it does not support the fixed dune and dune slack habitats that are present in the adjacent SSSI, it does contain some important habitats of UK conservation priority. The diverse short vegetation on hardstanding qualifies as the Open Mosaic Habitats on Previously Developed Land Habitat of Principal Importance and is similar to the Lowland Dry Acid Grassland HPI. The pond and the small area of reedbed are also HPIs, and the marshy grassland may qualify as the Purple Moor-grass and Rush Pastures HPI.

The mosaic of different habitats means the site is likely to be of importance for a range of associated species, including some protected and notable species, such as invertebrates, common lizard, skylark and barn owl. The rare natterjack toad has been recorded on site and a large population is known to be present in the adjacent Haverigg Haws dune habitats.

The conservation importance of the site is heightened by its location adjacent to Duddon Estuary SSSI and Ramsar Site, and Morecambe Bay SAC. It provides a protective buffer to these habitats of UK and European importance and the species they support.

In order to inform future management and monitoring at the site, further surveys for plants, breeding birds and reptiles are advised.

A number of management recommendations are made, with the main one being to reduce the area of Bramble scrub, preferably by cutting. Implementing these would ensure that biodiversity at the site is maintained and enhanced, thus contributing to the aims of the MoJ Estates Directorate Biodiversity Policy.

2 Introduction

Arcadis Consulting (UK) Ltd was commissioned by the Ministry of Justice (MoJ) in December 2018 to undertake ecological assessments of two sites within the MoJ estates cluster (specifically Her Majesty's Prison and Probation Service (HMPPS) estate) that are within or adjacent to Sites of Special Scientific Interest (SSSI), and provide advice on their SSSI status and how to improve them. These sites are known as MoJ Stage 1 SSSI sites.

This report presents the results of the assessment of HMP Haverigg, which is located 1km to the west of the village of Haverigg in Cumbria (see Figure 1 for location). The study area is an area of MoJ-owned land at the prison known as the Back Field ('the site'), as indicated by the red line on Figures 1 and 2. The site is adjacent to Duddon Estuary SSSI and Ramsar Site, and Morecambe Bay Special Area of Conservation (SAC; as shown on Figure 1). The Ordnance Survey (OS) grid reference of the centre of the site is SD139787. The total size of the site is approximately 30 hectares (74 acres).

The aim was to identify, describe and assess any features of potential ecological value on the site, with a focus on botany, and provide outline recommendations for biodiversity enhancement.

3 Methodology

3.1 Desk study

Existing ecological information relating to the site provided by the MoJ was reviewed.

Ordnance Survey (OS) mapping and aerial imagery was reviewed using Google and Bing Maps to assess the habitat context of the site and the wider landscape.

The Multi-Agency Geographic Information for the Countryside (MAGIC) website was consulted for records of statutory designated sites of nature conservation importance on or within 10km of the site boundary.

3.2 Field survey

An extended Phase 1 habitat survey of the site was undertaken by Gail Quartly-Bishop, Freelance Botanist and Ecologist, on 19 and 20 March 2019.

The Phase 1 habitat survey broadly followed the methodology detailed in the Phase 1 habitat survey handbook (Joint Nature Conservation Committee (JNCC), 2010). This entailed classifying and mapping habitat types, and collating plant species lists for each of the main habitat types that were identified during the survey. Botanical nomenclature followed that of Stace (2019).

In accordance with the Guidelines for Baseline Ecological Assessment (The Institute of Environmental Assessment (IEA), 1995), any potential presence or field evidence of protected or notable species was recorded.

The survey was undertaken with a focus on botany, since the MoJ had specified that understanding the plant diversity of the site was their main interest in commissioning the work.

The Phase 1 habitats were mapped in the field. Target Notes (TN) describing interesting features, important species and any other key information were taken and the locations marked on the plan. The Phase 1 habitat map is included in this report as Figure 2. The Target Notes are included in Appendix 1.

3.2.1 Limitations to survey

The survey was undertaken in March. Early spring is the most challenging time of year to undertake habitat and botanical surveys, as many plant species are either not visible, dead or seedlings at this time. Assessment of grasslands is easier than wetlands at this time of year. The surveyor has over 20 years' experience in botanical survey, which goes some way towards mitigating this limitation.

There had been very heavy rain in the days preceding the survey and some parts of the site proved inaccessible due to the depth of standing water.

4 Results

4.1 Designated sites

HMP Haverigg Back Field is immediately adjacent to sand dunes known as Haverigg Haws, which are included in Duddon Estuary SSSI and Ramsar Site, and Morecambe Bay SAC. These designations indicate that Haverigg Haws is important for nature conservation at both the national and international scale.

The citation for Duddon Estuary Ramsar Site provides a summary:

The estuary is one of the most important sites in Cumbria for sand dune communities, including areas of calcareous dunes at Sandscale and Haverigg Haws, and contrasting acid dunes at North Walney. A full range of dune types is present, from fore-dunes based on highly mobile sand dominated by Marram (Ammophila arenaria) grass, to more fixed yellow and grey dunes and dune grasslands. The calcareous nature of the sand has given rise to a very diverse flora with species such as Wild Pansy (Viola tricolor), Wild Thyme (Thymus polytrichus), Lady's Bedstraw (Galium verum) and the local Dune Fescue (Vulpia fasciculata). On each of the main dune systems there are areas of dune heath, a rare habitat, with Heather (Calluna vulgaris), Bell Heather (Erica cinerea), Cross-leaved Heath (Erica tetralix) and a mosaic of mosses and lichens. The dune slacks support a diverse flora including Seaside Centaury (Centaurium littorale), Marsh Helleborine (Epipactis palustris), Coralroot Orchid (Corallorhiza trifida). The wetter slacks are important for natterjack toads (Epidalea calamita).

Sandscale Haws is known for its population of great crested newts (Triturus cristatus) as well as natterjack toads. The Duddon estuary is also of international importance for its wintering and passage waterbird assemblage, including pintail (Anas acuta), knot (Calidris canutus), redshank (Tringa totanus), oystercatcher (Haematopus ostralegus), ringed plover (Charadrius hiaticula), curlew (Numenius arquata), dunlin (Calidris alpina), sanderling (Calidris alba), shelduck (Tadorna tadorna), red-breasted merganser (Mergus serrator). The foreshore at Haverigg Point is an important high tide roost for waterbirds. Hodbarrow Lagoon is an important breeding site for terns.

The section of sand dune immediately adjacent to the site is part of Unit 31 of the SSSI. This unit was reported to be in favourable condition as of the last assessment by Natural England. This part of Haverigg Haws was visited as part of the field survey on 19 March 2019 to assess its condition in relation to Common Standards Monitoring guidance (JNCC, 2004a). It was fenced off and grazed by sheep. It supported short fixed dune grassland dominated by Red Fescue (*Festuca rubra*) with pockets of Marram and Gorse (*Ulex europaeus*) scrub. There were scattered dune slacks with Creeping Willow (*Salix repens*) and ponds containing Soft-rush (*Juncus effusus*).

The criteria for favourable condition of the fixed dune habitat (JNCC, 2004a) are given in Table 1 below, along with an indication of whether the fixed dunes at Haverigg Haws met these criteria. The fixed dune grassland appeared to be in favourable condition insofar as it could be assessed at the time of year.

Table 1: Condition assessment of Haverigg Haws fixed dune grassland

Criterion	Result
Bare ground covering less than 10% of the total area.	Criterion met.
Vegetation height of 2 – 10 cm over 30 – 70% of total area.	Criterion met.
At least eight positive indicator species present.	Strictly speaking, only species more than occasionally present within the grassland qualify for this criterion, but given the time of year, presence was considered sufficient. Criterion met.

Criterion	Result
Negative indicator species no more than frequent and representing not more than 5% of the total area: Common Ragwort (*Senecio jacobaea*), Rosebay Willowherb (*Chamerion angustifolium*).	Both were rare. Criterion met.
Scrub / trees no more than occasional and covering not more than 5% of the total area.	Gorse patches were present along northern boundary of SSSI, but not more than 5%. Criterion met.

Heather was very occasionally present near the northern boundary of the SSSI. This is a positive indicator species associated with dune heath.

The dune slacks within the SSSI were observed to be of two types: slacks with very little standing water dominated by Creeping Willow; and deeper hollows dominated by rushes (*Juncus* spp.), primarily Soft-rush and Hard Rush (*Juncus inflexus*).

The criteria for favourable condition of humid dune slacks (JNCC, 2004a) are given in Table 2 below, along with an indication of whether the dune slacks at Haverigg Haws met these criteria. Owing to the very wet conditions on the day of survey and the timing of the survey in early spring, it was difficult to assess the condition of the dune slacks against all the criteria. In general, the slacks appeared to be in favourable condition and to meet all the criteria.

Table 2: Condition assessment of Haverigg Haws dune slacks

Criterion	Result
Bare ground present, less than 5% of total area.	Criterion met.
High cover of broadleaved herbs, sedges and rushes (>30%).	Criterion met.
At least six positive indicator species present.	The dune slacks did not meet the criterion requiring at least six positive indicator species to be present. However, given it was very early in the year, it was likely that at least some of these species were present, but not visible at the time of survey.
Negative indicator species no more than rare and not more than 5% of total area.	Criterion met.
Cover of Creeping Willow no more than 33% of total area.	Criterion met.
Scrub in addition to Creeping Willow no more than 5% of total area.	Criterion met.

Common toad (*Bufo bufo*) spawn was noted in one of the wet slacks.

4.2 Previous ecological records for the site

A Phase 1 habitat survey of the Back Field was previously undertaken in 2017 (MoJ, 2017a), and a reptile survey was conducted in 2008 (Naturally Wild Consultants Ltd., 2008). In addition to formal surveys by visiting ecologists, there were a number of anecdotal records of wildlife at the site reported by staff and residents.

4.2.1 Habitats and flora

Habitats and flora previously reported from the site were as follows:

Unimproved / semi-improved neutral grassland, specifically lowland hay meadow

The 2017 Phase 1 habitat survey (MoJ, 2017a) reported semi-improved neutral grassland of high value for biodiversity from the Back Field. Description from the report: *The semi-improved grassland areas of the site are dominated by species such as Cock's-foot (Dactylis glomerata), Crested Dog's-tail (Cynosurus cristatus) and Perennial Rye-grass (Lolium perenne). There are also several large rough grass-vegetative areas which contain aggressive agricultural weeds which include: Rosebay Willowherb, Bramble (Rubus fruticosus agg.) and Common Nettle* (*Urtica dioica*)*.*

Marshy grassland

No specific description of this habitat was given in the 2017 Phase 1 habitat survey.

Standing water

Description from the 2017 Phase 1 habitat survey: *The pond on the southwestern grassland of Haverigg's back field is showing signs of developing to maturity. Although it is a manmade structure with steep sloping sides the vegetation has grown around it allowing species to make residence.*

Flora

Plant species previously reported from the site included an assortment of those characteristic of improved and semi-improved neutral grassland. Of these, Bristly Oxtongue (*Helminthotheca echioides*) and Slender Thistle (*Carduus tenuiflorus*) are rare in Cumbria, and if confirmed, would be new records for the 10km grid square.

4.2.2 Fauna

Fauna previously reported from the site were as follows:

Invertebrates

The June 2017 Phase 1 habitat survey (MoJ, 2017a) reported a number of common invertebrates typical of grasslands.

Amphibians

The 2008 reptile survey (Naturally Wild Consultants Ltd., 2008) reported a single incidental record of a juvenile natterjack toad on the bund near the wetland area. This species is known to breed on Haverigg Haws, which supports a large population.

The 2017 Phase 1 habitat survey discussed other amphibian species potentially present on site, but it is not clear which species have been anecdotally reported from the site and which are potentially present in the local area based on National Biodiversity Network (NBN) Atlas records. The species are common frog (*Rana temporaria*), common toad, smooth newt (*Lissotriton vulgaris*) and palmate newt (*Lissotriton helveticus*), all of which are widespread in west Cumbria.

Reptiles

The 2008 reptile survey reported a very small population of breeding common lizard on the two large bunds on site. No other reptiles were recorded during the survey.

The HMP Haverigg Biodiversity Action Plan (BAP; MoJ, undated) reported slow worm (*Anguis fragilis*) on the site, but the originator and date of the records are unknown. Anecdotal reports of grass snake (*Natrix helvetica*) were mentioned in the 2017 Phase 1 habitat survey report. Both of these species are widespread and could conceivably occur at the site, although the results of the formal survey in 2008 suggest that, if present, populations are probably very small.

Sand lizard (*Lacerta agilis*) have also been reported anecdotally, but this seems likely to be the result of confusion with common lizard, as the former are not known to occur in the county. Male common lizard sometimes have green coloration on their backs during the breeding season and this is often the source of confusion, as male sand lizards are usually also green.

Birds

There has been a barn owl (*Tyto alba*) box at HMP Haverigg for many years and barn owls bred regularly at the site until several years ago when only one of the two owls returned. The status of the box was unknown at the time of survey, but frequent sightings of barn owl continue and pellets were reported during the June 2017 Phase 1 habitat survey.

The 2017 Phase 1 habitat survey also reported a number of other bird species such as snipe (*Gallinago gallinago*), skylark (*Alauda arvensis*), blue tit (*Cyanistes caeruleus*), magpie (*Pica pica*) etc. Anecdotal reports included kestrel (*Falco tinnunculus*), grey partridge (*Perdix perdix*), lapwing and swift (*Apus apus*).

Mammals

Mammal species previously reported from the site included anecdotal sightings of stoat (*Mustela erminea*) and polecat (*Mustela putorius*), as well as mention of voles, shrews and wood mouse (*Apodemus sylvaticus*) in the 2017 Phase 1 habitat report. All of these are widespread and common in the county.

4.2.3 Management of the site

The HMP Haverigg Site Management Plan Agreement (MoJ, undated) reported that the Back Field had not been used for over ten years. Previously, the field was partly in agricultural use.

4.3 March 2019 survey of the site

4.3.1 Habitats and flora

The site did not support the fixed dune and dune slack habitats that were present in the adjacent SSSI. However, the following habitats were recorded (see Figure 2 and accompanying Target Notes in Appendix 1):

Conifer plantation

A line of planted pine (*Pinus* sp.) trees was present over coarse (tussocky) improved grassland (TN10).

Scrub

Dense Bramble scrub was a conspicuous feature of the site and there was Bramble scattered through every habitat present. Marshy areas also had scattered willow (*Salix* sp.) scrub (TN1).

Improved grassland

The site supported large areas of coarse tussocky improved grassland with scattered Bramble and patches of weedy species such as docks (*Rumex* spp.), Common Nettle and Rosebay Willowherb (TN2 and TN6). This was a scrubby version of the National Vegetation Classification (NVC) type MG1e False Oat-grass (*Arrhenatherum elatius*) grassland (Rodwell, 1992).

The criteria for favourable condition of neutral grassland meadows are specified by JNCC (2004b). These criteria are given in Table 3 below, along with an indication of whether the grassland on site met these criteria. As expected, the grassland met few of the criteria and was not in favourable condition.

Table 3: Condition assessment of grassland on site

Criterion	Result
Cover of broadleaved herbs and sedges is 40 – 90% of the total area.	The grassland was 90%+ grasses except where weedy species were prevalent. Criterion not met.
Positive indicator species are present with at least 2 – 6 species frequent in the vegetation.	Positive indicator species were present but occurred rarely. Species recorded included Common Vetch (*Vicia sativa*), Wild Carrot (*Daucus carota* subsp. *carota*), Dove's-foot Crane's-bill (*Geranium molle*) and Black Knapweed (*Centaurea nigra*). Criterion not met.

Criterion	Result
Negative indicator species are no more than occasional in the sward and constitute not more than 5% overall.	Cover of docks, Common Nettle and Rosebay Willowherb (if assessed in mid season) would likely be more than 5% overall as there were a number of large patches. Criterion unlikely to be met.
Agricultural grasses such as Perennial Rye-grass no more than 20% of total cover.	Easier to assess in summer, but might have met this criterion.
Coarse grasses such as Cock's-foot and False Oat-grass no more than 10% cover collectively.	These species formed the majority of the vegetation. Criterion not met.
Scrub and Bracken (*Pteridium aquilinum*) no more than 5% cover.	Bramble scrub was frequent. Criterion not met.
Sward height between 5 and 20cm for pastures and no less than 5-10cm for hay meadows.	This criterion relates to traditional management and was not applicable to this site.
Cover of litter (dead grass at the base of tussocks) less than 25%.	The grassland was very tussocky with a lot of dead grass at the base of tussocks. Criterion not met.
Bare ground less than 5% of total area.	Criterion met as there was very little bare ground.

Marsh / marshy grassland

There were two large areas of marsh dominated by rushes with scattered willow scrub (TN8). Based on what could be observed during the March survey, this habitat appeared to be the NVC type M23 rush-bedstraw pasture (Rodwell, 1991). Purple Moor-grass (*Molinia caerulea*) and rush pastures is a Habitat of Principal Importance (HPI) for the conservation of biodiversity in England, as listed in Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006 (Her Majesty's Stationery Office (HMSO), 2006).

The criteria for favourable condition of Purple Moor-grass and rush pastures are specified by JNCC (2004b). These criteria are given in Table 4 below, along with an indication of whether the marshy grassland on site met these criteria. The marshy grassland may have been in favourable condition although it was difficult to assess at the time of year.

Table 4: Condition assessment of marshy grassland on site

Criterion	Result
Positive indicator species are present with at least 2 – 6 species frequent in the vegetation.	Difficult to assess at this time of year, particularly with access restricted by standing water. Purple Loosestrife (*Lythrum salicaria*) and Marsh Pennywort (*Hydrocotyle vulgaris*) were both positive indicator species for this habitat.
Cover of large rush species and/or Purple Moor-grass is 25 – 80%.	Criterion met.
Negative indicator species are no more than occasional in the sward and not more than 5% overall.	Creeping Thistle (*Cirsium arvense*), Common Ragwort, Curled Dock (*Rumex crispus*) and Common Nettle were all present and less than 5% overall. Criterion met.
Agricultural grasses such as Perennial Rye-grass no more than 20% of total cover.	Easier to assess in summer, but might have met this criterion.

Criterion	Result
Coarse grasses such as Cock's-foot and False Oat-grass no more than 20% cover collectively.	Easier to assess in summer, but might have met this criterion.
Scrub and Bracken no more than 5% cover.	Bramble scrub was fairly frequent and there were also scattered willows so criterion close to not being met.
Vegetation height 5 – 80 cm.	Criterion met.
Cover of litter (dead grass at the base of tussocks) less than 25%.	Difficult to assess owing to wet conditions, but might have met this criterion.
Bare ground less than 10% of total area.	Criterion met as there was very little bare ground.

There was also a separate small area of marsh dominated by Soft-rush with dense Bramble in the south-eastern corner of the site (TN5).

Swamp

There was a small area where Common Reed (*Phragmites australis*) and Bramble were co-dominant (TN4). Reedbeds are a HPI, although small examples like this are not usually considered important for conservation in isolation, rather as part of a habitat mosaic as seen within the marshy areas identified at TN8.

Standing water

There was a man-made pond (TN7) in the south of the site which contained no aquatic vegetation at the time of survey. Ponds are a HPI, but this appeared to be a poor example based on observations during the March survey.

Running water

A drain ran into a sump at the eastern end of the site (TN11). At the eastern end there was no vegetation except algae and patches of horsetail (*Equisetum* spp.), and at the western end it was dominated by grasses including Creeping Bent (*Agrostis stolonifera*).

Ephemeral / short perennial

This was the most botanically diverse habitat on site (TN3). Abandonment of areas of hardstanding associated with the airfield had resulted in colonisation by a large number of mosses and low-growing plant species including positive indicator species for fixed dune grassland such as Common Stork's-bill (*Erodium cicutarium*), Common Bird's-foot-trefoil (*Lotus corniculatus*) and Mouse-ear-hawkweed (*Pilosella officinarum*).

This habitat was analogous to the HPI Open Mosaic Habitats on Previously Developed Land. It lacked bare loose soil but otherwise demonstrated the mosaic of open, short vegetation characteristic of this habitat. There are no specific condition assessment guidelines for this habitat type, but it was similar to the lowland dry acid grassland NVC type U1 Sheep's-fescue (*Festuca ovina*) – Common Bent (*Agrostis capillaris*) – Sheep's Sorrel (*Rumex acetosella*) grassland (Rodwell, 1992) in terms of its diversity of mosses, lichens and higher plants in a matrix of short vegetation and open ground.

This habitat met all of the criteria for favourable condition of lowland dry acid grassland specified by JNCC (2004b), as shown in Table 5 below.

Table 5: Condition assessment of ephemeral / short perennial on site

Criterion	Result
Positive indicator species are present with at least 2 – 6 species frequent in the vegetation.	Numerous positive indicator species were present and frequent, including Cladonia lichen, Common Stork's-bill, Common Bird's-foot-trefoil, Mouse-ear-hawkweed,

Criterion	Result
	Sheep's Sorrel and stonecrop (*Sedum* spp.) species. Criterion met.
Cover of bryophytes and lichens 15 – 90%.	Numerous bryophyte species were present and frequent. Criterion met.
Negative indicator species are no more than occasional in the sward and not more than 5% overall.	Common Ragwort was present but not more than 5% cover. Criterion met.
Agricultural grasses such as Perennial Rye-grass no more than 20% of total cover.	Criterion met.
Coarse grasses such as Cock's-foot and False Oat-grass no more than 10% cover collectively.	Criterion met.
Scrub and Bracken no more than 5% cover.	Criterion met.
Sward height between 1 and 25cm, preferably less than 10 cm.	Criterion met.
Cover of litter (dead grass at the base of tussocks) less than 25%.	Criterion met.
Bare ground present and up to 50% of total area.	Criterion met.

Flora

Bristly Oxtongue and Slender Thistle that were previously reported were not observed during the survey, but as it was undertaken during March these species would be expected to be less conspicuous. All plant species recorded during the survey are common in West Cumbria in appropriate habitats.

4.3.2 Fauna

Invertebrates

A single anthill was noted on the edge of the large bund. Owing to the cool weather, invertebrates were not conspicuous on site during the survey. It was likely that the site supported assemblages of common terrestrial invertebrate species, and could potentially have supported some notable species.

Amphibians

No amphibians were observed during the survey. The pond (TN7) provided potential amphibian breeding habitat, although given its use by large numbers of ducks and the apparent lack of vegetation, it did not appear to be optimal for any amphibian species. The most likely species to be present was common toad, particularly since they are known to breed in the nearby dune slacks. The pond did not provide favourable habitat for breeding natterjack toad, as this species prefers shallow scrapes rather than deeper ponds.

The areas of grassland, scrub, swamp and conifer plantation all provided suitable terrestrial habitat for amphibians.

Reptiles

No reptiles were observed during the survey. The bunds previously noted to support a very small population of common lizard were still present on site but had been substantively overgrown by dense Bramble scrub, which reduces their suitability for this species.

Birds

Approximately 40 mallard (*Anas platyrhynchos*) were flushed from the pond, presumably having been roosting there, and about ten snipe from the northern marshy area. The marshy areas provided potential nesting habitat for snipe. A barn owl was seen hunting over the large bund. Skylark were heard singing over the grassland throughout the survey which suggested they may have been nesting on site. Lapwing were heard over the sheep pasture to the east of the site.

Of these species, skylark and lapwing are red listed amongst the UK Birds of Conservation Concern (Eaton *et al.*, 2015) because of declining populations. Both are Species of Principal Importance (SPI) for the conservation of biodiversity in England, as listed in Section 41 of the NERC Act 2006. They nest on open ground or in areas of short vegetation on sites with diverse habitat structure. Skylark typically nest on drier ground than lapwing, but the combination of short open ground with tussocky grassland and wetland present on the site provided potentially suitable breeding habitat for both species.

Barn owl are specially protected during the breeding season under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended; HMSO, 1981). They are currently green listed (Eaton *et al.*, 2015), but populations remain vulnerable to loss of hunting habitat, disturbance to roosts and road traffic collisions. Barn owl are a flagship species for nature conservation, since they are conspicuous, attractive and generally well-loved. The tussocky grassland on site provided ideal hunting habitat for barn owl.

Mammals

Badger (*Meles meles*) footprints were seen in the mud outside the southern boundary fence of the site during the survey. No signs of badger were seen inside the fence. There was a scattering of mole (*Talpa europaea*) hills in grassland areas on site and the tussocky grassland presented ideal habitat for voles.

5 Assessment

The Back Field at HMP Haverigg is likely to be of district / borough importance for biodiversity (as defined in the EcIA Guidelines (Chartered Institute of Ecology and Environmental Management (CIEEM), 2018)). Although it does not support the fixed dune and dune slack habitats that are present in the adjacent SSSI, it does contain some important habitats of UK conservation priority. One of these is the diverse short vegetation on hardstanding, which qualifies as the Open Mosaic Habitats on Previously Developed Land HPI and is similar to the Lowland Dry Acid Grassland HPI. The pond and the small area of reedbed are also HPIs, and the marshy grassland may qualify as the Purple Moor-grass and Rush Pastures HPI.

The mosaic of different habitats means the site is likely to be of importance for a range of associated species, including some protected and notable species, such as invertebrates, common lizard, skylark and barn owl. The rare natterjack toad has been recorded on site and a large population is known to be present in the adjacent Haverigg Haws dune habitats.

The conservation importance of the site is heightened by its location adjacent to Duddon Estuary SSSI and Ramsar Site, and Morecambe Bay SAC. It provides a protective buffer to these habitats of UK and European importance and the species they support.

6 Recommendations for further survey

The following survey work is recommended to inform future management of the site for biodiversity:

- Summer vegetation survey to provide a more detailed assessment of marsh, improved grassland and short open vegetation on areas of hardstanding, against favourable condition criteria.
- Pond survey in summer to assess vegetation present (if any).
- Barn owl survey by suitably licensed and experienced persons – the World Owl Trust previously carried out surveys at the site and it would be desirable to resume this relationship if possible.

- Breeding bird survey to confirm whether skylark, lapwing, snipe etc. are breeding at the site and if possible to provide estimates of numbers.
- Reptile survey to confirm whether common lizard are still present on site and if possible to estimate population size class. The survey should be carried out by a suitably experienced person licensed to survey for natterjack toad given the potential for disturbing this species in the process.
- Repeated summer vegetation surveys annually for five years to assess changes in Bramble scrub cover, and monitor willow cover to decide whether any reduction of willow is needed to maintain favourable condition of marsh areas.

7 Management recommendations

It is very important when planning future management of the Back Field to appreciate the value of features already present on the site, and to be aware of how management aimed at benefiting one feature can conflict with the requirements of another. For example, the improved grassland does not meet many of the favourable condition criteria for neutral grassland, but the tall tussocky structure which is less than ideal for botanical diversity provides excellent habitat for voles and therefore for hunting barn owl. HMP Haverigg could expend considerable effort in trying to turn this into a species-rich grassland (similar to that in the adjacent SSSI) but in the process remove its current value to wildlife.

At present, the most valuable features of the site for biodiversity are as follows (in no particular order):

- Marsh and swamp vegetation with snipe.
- Diverse short vegetation on areas of hardstanding.
- Barn owl hunting over improved grassland.
- Combination of short and tall vegetation suitable for nesting skylark and lapwing.
- Bunds where common lizard were recorded in 2008.

Future management of the site should aim to maintain the quality of the above features.

The favourable condition of these features is threatened by the large and increasing amount of Bramble scrub. Scrub control is therefore the most important recommendation for management of this site. This should aim to reduce the area of Bramble scrub present on site by cutting during the winter period (October to February inclusive). Cutting in winter is necessary to avoid harm to nesting birds.

Ultimately, it would be desirable to reduce the amount of scrub on site to 5 – 10% cover, so that there are scattered patches rather than large dense areas. Bramble cutting should aim to break up large dense blocks rather than trying to remove them entirely.

Priority areas are as follows:

- Dense Bramble on the two bunds previously identified as supporting common lizard (TN9 and the smaller bund to the north), aiming for a significant reduction in Bramble cover. It is desirable to have scattered scrub here to provide some cover for lizards, but dense patches are undesirable.
- Dense Bramble in the northern part of the site, starting at the eastern end of TN1 where the Bramble is least abundant and cutting will have the greatest effect in reducing cover. The north-western corner of the site has an impenetrable thicket of Bramble which is unlikely to respond to repeated cutting, and hence efforts are best focused elsewhere.
- Scattered scrub among improved grassland and marshy areas should be managed with the aim of maintaining or slightly reducing areas of Bramble in these habitats.

It is not necessary to cut all of these areas in one go, rather reducing the amount of Bramble on site should be seen as a long term objective requiring annual attention. Cutting different parts of the site in different years is good practice.

Hand cutting is an option, but mechanised cutting is usually more efficient. A method which allows removal of the arisings from site would be ideal. Bramble should be cut no lower than 15cm above ground level – amphibians and reptiles may take refuge in the base of shrubs, so it would be inappropriate to cut to ground level or remove stumps at this site.

Given the sensitivity of the open short vegetation on hardstanding, it will be important to consider which of machine mowing or trampling by people with brush-cutters or strimmers would have the least impact on this habitat.

The Five-Year Strategic Plan for Biodiversity at HMP Haverigg (MoJ, 2018) recommended introducing livestock grazing regimes to the Back Field to manage the long rank grasslands for wading birds, amphibians and local wild flora. Grazing was considered following the scrub control, but to control Bramble using sheep or goats requires high grazing pressure (otherwise the animals eat other more palatable plants) and this would result in loss of the tussocky structure of the grassland which currently makes it suitable for barn owl and reptiles. A high intensity of grazing would likely result in damage to the short vegetation on the hardstanding by trampling and deposition of dung, and could also result in reduced breeding success for ground-nesting birds. Finally, to make the site suitable for livestock would require the removal of much of the scrap material currently present on site which, although unsightly, provides ideal refuges for reptiles such as common lizard. On balance, the benefits of grazing the site are outweighed by the potential negative consequences.

Reducing the amount of Bramble scrub on the site will improve habitats for reptiles such as common lizard and will provide an increased area of grassland favourable for use by barn owl. It will improve the general condition of grassland and marsh habitats in accordance with JNCC criteria for condition assessment.

7.1 Protected species and site management

Common lizard and other widespread reptiles are protected from killing and injury under the Wildlife and Countryside Act 1981 (as amended). Natterjack toad are fully protected under the Conservation of Habitats and Species Regulations 2017 (as amended; HMSO, 2017), and the Wildlife and Countryside Act 1981 (as amended). The combined effect of this legislation protects natterjack toad from killing and injury, and their breeding and resting habitats from damage and destruction. This means that management activities on site, such as scrub control, need to be carefully considered to ensure that they do not inadvertently kill or injure amphibians and reptiles or damage their habitat.

In this case, undertaking scrub control work during winter, when amphibians and reptiles are generally hibernating below ground, and cutting the Bramble to no lower than 15cm above ground level to protect potential refuges in the bases of plants, will safeguard any individual animals present and the refuges they may be using. Aiming to break up large areas of scrub into scattered patches provides sufficient retained scrub for any animals emerging from hibernation. These reasonable avoidance measures mean that a protected species licence is unlikely to be required for scrub control at this site.

Other recommendations are:

- Continue to use no fertiliser, pesticides or herbicides on the site.
- The pond at TN7 provides potential habitat for common toad, but it is generally considered undesirable to promote populations of this species in areas where natterjack toad are present because the two species compete for food. Natterjack toad populations are considerably rarer and therefore must take priority. There is a large population of natterjack toad in Haverigg Haws adjacent to the site and this species has previously been recorded on site, hence no management work on the pond is recommended at the present time.

8 Conclusions

The Back Field at HMP Haverigg is likely to be of district / borough importance for biodiversity. Although it does not support the fixed dune and dune slack habitats that are present in the adjacent SSSI, it contains some important habitats of UK conservation priority; namely diverse short vegetation on hardstanding, a pond, reedbed and marshy grassland. The mosaic of different habitats means the site is likely to be of importance for a range of associated species, including some protected and notable species, such as invertebrates,

common lizard, skylark and barn owl. The rare natterjack toad has been recorded on site and a large population is known to be present in the adjacent Haverigg Haws dune habitats.

The conservation importance of the site is heightened by its location adjacent to Duddon Estuary SSSI and Ramsar Site, and Morecambe Bay SAC. It provides a protective buffer to these habitats of UK and European importance and the species they support.

In order to inform future management and monitoring at the site, further surveys for plants, breeding birds and reptiles are advised.

A number of management recommendations are made, with the main one being to reduce the area of Bramble scrub, preferably by cutting. Implementing these would ensure that biodiversity at the site is maintained and enhanced, thus contributing to the aims of the MoJ Estates Directorate Biodiversity Policy.

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10 FIGURES

Figure 1: Location plan

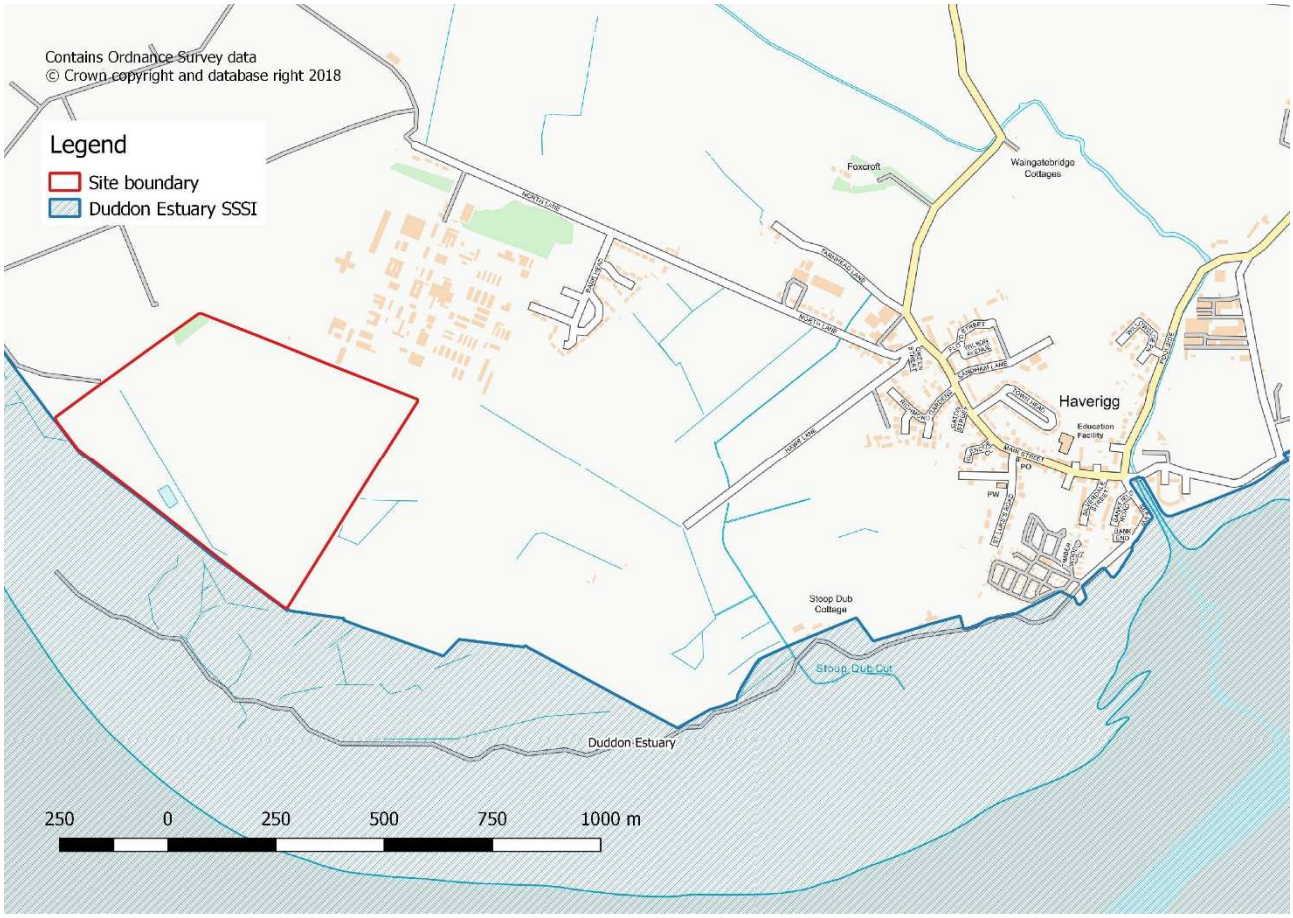
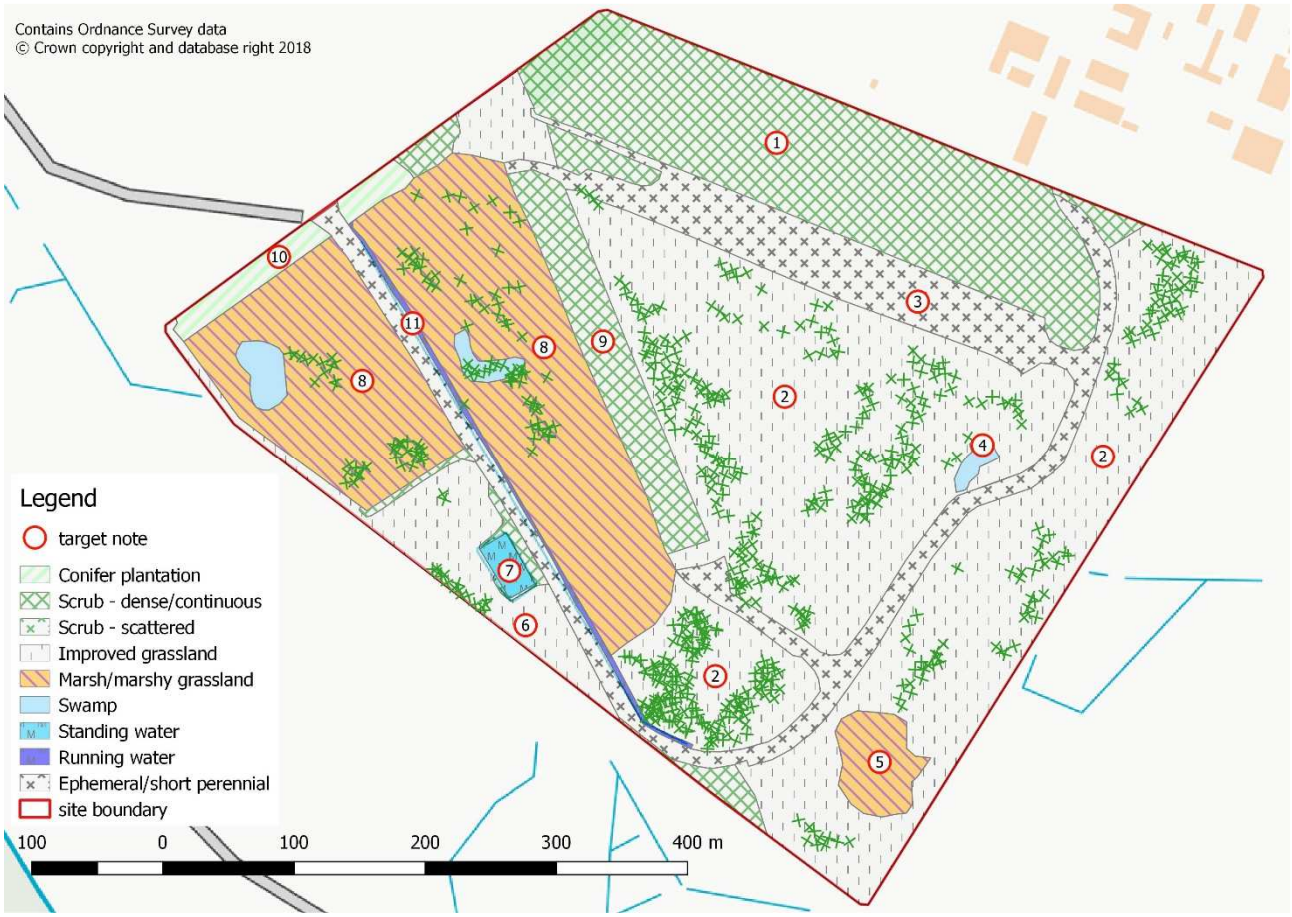


Figure 2: Phase 1 habitat map



11 APPENDICES

Appendix 1: Target Notes

Target Note	Description
1	Dense Bramble (*Rubus fruticosus* agg.) scrub with pockets of coarse improved tussocky grassland, Soft-rush (*Juncus effusus*) and tall ruderal herbs, primarily Common Nettle (*Urtica dioica*) and Rosebay Willowherb (*Chamerion angustifolium*). Species present include Bramble, Rosebay Willowherb, False Oat-grass (*Arrhenatherum elatius*), Cock's-foot (*Dactylis glomerata*), Yorkshire-fog (*Holcus lanatus*), Cleavers (*Galium aparine*), Gorse (*Ulex europaeus*), Red Fescue (*Festuca rubra*), Common Vetch (*Vicia sativa*), Soft-rush, Wild Carrot (*Daucus carota* subsp. *carota*), Dove's-foot Crane's-bill (*Geranium molle*), Creeping Buttercup (*Ranunculus repens*), Broad-leaved Dock (*Rumex obtusifolius*), Common Nettle, Common Ragwort (*Senecio jacobaea*), Common Chickweed (*Stellaria media*), Dandelion (*Taraxacum* agg.), Common Bent (*Agrostis capillaris*), Creeping Thistle (*Cirsium arvense*) and Curled Dock (*Rumex crispus*). This area contains log piles and brash arising from the felling of pine trees along the site boundary.
2	Coarse tussocky improved grassland dominated by mixtures of Cock's-foot, Yorkshire-fog and Red Fescue with much scattered Bramble scrub and pockets of tall ruderal herbs. Species list very similar to TN1. Skylark (*Alauda arvensis*) heard singing throughout survey.
3	Ephemeral/short perennial vegetation on hardstanding originating from former runways. The narrow strip along the boundary fence (not mapped) has been colonised by a diverse array of species, including Annual Meadow-grass (*Poa annua*), Dandelion, White Clover (*Trifolium repens*), Common Mouse-ear (*Cerastium fontanum*), Common Stork's-bill (*Erodium cicutarium*), Red Dead-nettle (*Lamium purpureum*), Cat's-ear (*Hypochaeris radicata*), Yarrow (*Achillea millefolium*), Ivy-leaved Speedwell (*Veronica hederifolia*), Groundsel (*Senecio vulgaris*), Red Fescue, Dog Lichen (*Peltigera canina*), *Cladonia* lichens, Weld (*Reseda luteola*), Common Bird's-foot-trefoil (*Lotus corniculatus*), Yorkshire-fog, Curled Dock, stonecrop species (*Sedum* spp.), Cock's-foot, crane's-bill species (*Geranium* spp.), Common Whitlowgrass (*Erophila verna*), Rue-leaved Saxifrage (*Saxifraga tridactylites*), Mouse-ear Hawkweed (*Pilosella officinarum*), Daisy (*Bellis perennis*) and a profusion of moss species including *Brachythecium rutabulum*, *Syntrichia ruralis s.l.*, *Bryum capillare*, *Bryum argenteum*, *Orthotrichum anomalum*, *Grimmia pulvinata*, *Schistidium apocarpum* agg., *Bryum dichotomum*, *Hypnum cf lacunosum*, *Didymodon* species, *Barbula* species, *Calliergonella cuspidata*, *Climacium dendroides* and the liverwort *Lophocolea semiteres*. N.B. Scientific names only are used for mosses, since English names exist but are not widely understood. In places, there are large piles of rubble and scrap materials.
4	Swamp consisting of dense Common Reed (*Phragmites australis*) with a tangle of dense Bramble.
5	Marshy area dominated by Soft-rush with dense Bramble.
6	Coarse tussocky improved grassland which was species-poor and dominated by grasses with few accompanying herbs.
7	Man-made pond believed to have been constructed as a reservoir of water to be used in case of fire. Lined with black membrane which appears to be failing in the south-eastern corner. Banks have Bramble and Gorse scrub and pockets of coarse improved grassland. No sign of any aquatic or marginal vegetation, but this does not rule out the possible presence of vegetation later in the summer. Approximately 40 mallard ducks (*Anas platyrhynchos*) flushed from the pond on approach.
8	Two large areas of marsh dominated by rushes including Soft-rush and Sharp-flowered Rush (*Juncus acutiflorus*) with pockets of willow scrub (either Goat Willow (*Salix caprea*) or Grey Willow (*Salix cinerea*), or both) and Bramble. On the day of survey, there was significant standing water in these areas above wellington boot depth which made detailed survey impossible. Species recorded included Soft-rush, Sharp-flowered Rush, Jointed Rush (*Juncus articulatus*), willow, Bramble, Great Willowherb (*Epilobium hirsutum*), Yorkshire-fog, Creeping Bent (*Agrostis stolonifera*), Marsh Pennywort (*Hydrocotyle vulgaris*), Lesser Spearwort (*Ranunculus flammula*) and what appeared to be Purple-

Target Note	Description
	loosestrife (*Lythrum salicaria*; only the dead stems from last year were visible). Both areas contain at least one area of reed swamp which was inaccessible on the day of survey due to standing water, and so have been mapped approximately. They appeared similar to TN4. Approximately ten snipe (*Gallinago gallinago*) were flushed from the northern marshy area on approach.
9	Dense Bramble scrub on bund with pockets of coarse grassland and tall ruderal herbs, very similar to TN1, but with much rubble and scrap material dotted about.
10	Plantation of pine trees over coarse improved grassland.
11	Drain running into a sump at the eastern end. At the eastern end there is no vegetation except algae and pockets of horsetail (*Equisetum* sp.), and at the western end the drain is dominated by grasses including Creeping Bent.

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