

ISLE OF MAN
DEPARTMENT OF INFRASTRUCTURE
Highway Services



GUIDELINES ON BIODIVERSITY AND HIGHWAY SERVICES

MAY 2022

Guidelines on biodiversity and highway services

The Isle of Man is made up of approximately 600-700 miles of rural and suburban road networks and footpaths. This is an immense resource - supporting an array of important habitats and species.

Safety must always be the Department of Infrastructures ('DOI' or 'the Departments') first concern and receive priority over other considerations. However, the purpose of this document is to guide the DOI Highway designers and engineers into incorporating certain structures and/or measures into their work to protect or even improve the biodiversity present at sites of interest on the island.

Need to know:

- A) In general, the Department does not "own" the land adjacent to the road. We only undergo maintenance in terms of road/public safety

- B) Unless necessary under road and/or public safety reasons, all highway verge cuttings are completed outside the nesting season following the legislation outlined in the Wildlife Act 1990.

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Biodiversity Importance and Impacts

The term biodiversity refers to all different kinds of life found in one area – the variety of animals, plants, fungi and microorganisms. Each play a huge role in structuring ecosystems and are essential for processes that support all life on Earth.

Biodiversity delivers functioning ecosystems that supply oxygen, clean air and water, pollination of plants, pest control and many more ecosystem services. It also provides opportunities for recreational activities which improves the physical and mental health of those who take part.

On the Isle of Man there is a great variety of wildlife. However, it is continuously threatened by human activities and development – one of which is highway construction. The main habitats threatened by highway construction are: wetlands, freshwater, farmland & hedgerows, grassland, heathland & moorland, towns & gardens, woodlands and peatlands.

Road infrastructure affects biodiversity in numerous ways. It increases fragmentation of habitats, changes landscapes and alters the physical environment, creates a barrier to natural animal movement and migratory behaviour, increases environmental pollution, increases deforestation and habitat destruction and increases traffic mortality (road kills).

Habitats

Refer to appendix 1 for detailed maps of each habitat the DOI have records of on the Isle of Man, as of 2022.

Wetlands

Wetlands are unique ecosystems and some of the most threatened habitats around the world. Not only are they key for carbon storage but also key habitats for a range of species. They are either permanently or seasonally inundated with water and are dynamic habitats coming in a range of forms such as; floodplains, deltas, lakes, ponds, ditches and marshes.

The Ballaugh Curragh's are a perfect example of a wetland habitat although it mixes with other types.





Freshwater

Freshwater and wetland habitats interface with one another, often crossing each other's paths and hosting has a habitat to the same or similar species. The three main types of freshwater habitat include; ponds and lakes, rivers and streams and wetlands. There are various locations around the island that could be an example of this habitat. One such example are glens such as Ballaglass, Groudle or Dhoon Glen which have rivers and streams running through the heart of the glen.

Farmland & Hedgerows

Farmland and hedgerows are one of the most easily encountered wildlife habitats, found adjacent to roads, footpaths and urban areas. Both offer the only link between other isolated patches of habitat across the landscape and provide valuable nesting and foraging grounds for varied wildlife. Like freshwater, these habitats are dotted all around the island, but for reference the photo to the left was taken in Maughold towards Maughold village.



Grassland



Grasslands are very common habitats around the world, however they vary in form depending on the climate. On the Isle of Man, they are classified into upland (above 300m) and lowland and/or acidic and neutral. They are diverse wildlife havens and many have developed from human activities, particularly agricultural 'improvement'. Species diversity is often high. Acidic grasslands are mainly hill grazing land (such as the Mountain Road) which is relatively species poor compared to other habitats and transitions from wet

and dry heath. Neutral or improved grasslands occur when it has previously been affected by fertiliser application – meaning there is a reduction in species diversity. Examples of

grassland habitats around the island include coastal areas and along the Ballamodha Straight.

Heathland & Moorland

Heathland occur on infertile and well-drained soils and are often characterised by plants such as heather, gorse and bracken. Moorland on the other hand, are typically more upland in wetter conditions. They are characterised by low-growing shrubs, damp peaty soils and bog-mosses. Both these habitats have been extensively modified and maintained by past and present human activities, for example, grazing animals. The majority of heathland found on verges in the Isle of Man are dry dwarf shrub heath whereas wet heath occurs very little.



Towns & Gardens



Green spaces present in urbanised areas and gardens are small but vitally important spaces for a range of wildlife. They provide little havens scattered throughout the landscape for services such as shelter, food and pollination hotspots for insects and birds.

Woodland

Woodlands hold a rich and diverse range of habitats for multiple species. Like all habitats above, woodlands can help purify our air and water, reduce flood risks and decontaminate soils via bioremediation. They are normally developed at the edge of semi-natural verges and can be found in locations such as Narradale and Glen Roy.



Peatlands



Peatlands are technically in the group of wetlands, however, due to ongoing work on the island, peatlands have been given a specific paragraph. Peatlands are defined by their accumulation of organic matter under water-logged conditions. In the Isle of Man there is approximately 10,000 hectares of peat in the uplands, however, no further data has been provided. It's safe to say all upland roads, greenlanes, greenway roads and public footpaths sit on top of peat

as well as the ground adjacent to the road/track. They not only serve as key carbon stores, but also provide an assembly of rich biodiversity.

Furthermore, under the Climate Change Bill 2020, in 'amendments to enactments', Section 8B 'Disturbance of registered peatland areas prohibited' it states the protection in place for registered peatlands and penalties faced if damage occurs.

'Any person who disturbs peatland in a registered peatland area... is guilty of an offence and is liable ... to a fine ... or conviction on information, to a fine.'

In summary, peatland habitats are greatly important not only for species diversity but for climate change – specifically carbon storage and sequestration. No damage can come to them even from essential work by the DOI. Permission must be granted by DEFA and/or the owner of the land.

Recommended Guidelines

The Department and Local Authorities undertake highway vegetation maintenance along highways and footpaths to aid visibility and prevent vegetation protruding onto said areas. These are often required between one and three times a year, and works are generally undertaken outside peak times. In the weeks leading up to the TT, additional hedge and highway verge maintenance is completed to ensure the riders and spectators safety.

Highway Verge Maintenance

Highway verges for conservation management often have a wilder appearance which many appreciate. However, many would prefer to see a 'tidy' garden-like countryside achieved at the expense of wildlife. This guideline hopefully allows a degree of compromise with respect to specific sites.

Limited manpower and financial resources restrict the amount of roadside management that can be achieved, yet, highway verge maintenance is often required between 1 to 3 times a year, outside of the nesting season (1st March to the 31st August).

Hedgerow Cutting

Avoid hedgerow maintenance operations during spring and summer. Cutting should be completed between the 1st September and the end of February. Hedges should be cut every 2 to 3 years, ensuring a variety of shapes are left to create diversity. Further requirements are to leave no gaps between the hedges, this discourages specific species such as bats from foraging in the area.

Do not cut invasive species such as Japanese Knotweed (figure 1). If found during maintenance work, leave untouched and contact DEFA to report the sighting. Other invasive species include Himalayan Balsam and Montbretia.



Figure 1 Photo provided by the Isle of Man Government, Department of Environment, Food and Agriculture to identify Japanese Knotweed.

Highway verge/ bank cutting

Prior to any cutting, any promising-looking saplings must be clearly marked and left to grow. Wildflower areas and roadside nature reserves are to be left untouched unless a) the wildflowers have died or b) public safety is at risk. If either site is to be worked on, it is crucial that it is conducted after the species of concern (E.G wildflowers) have flowered and set seed – approximately in late summer.

If work is conducted by a tractor and flail the minimum height of all cutting should be 100mm. Other equipment such as brush cutters or strimmer's may be used on other sites where access with larger equipment is not possible. In these cases, the height of 100mm may not be possible therefore the height may be adjusted, however, the vegetation must not be 'shaved' off as this would cause unnecessary destruction. All work should ensure top soil is not exposed or disturbed by the cutting activity.

The DOI consider verges wider than 1m and those less than 1m separately. Stated in the 'Road Verge Survey Project Report 1997' by Angela Scott, verges that are wider than 1m can be divided into four zones (Figure 1).

- Zone 1:** A 1m safety strip than can be cut twice a year
- Zone 2:** Cut every other year allowing taller grasses and wildflowers to thrive. Second cut is usually cut with the safety strip in zone 1. If left uncut, competitive species such as docks, nettles etc... will replace the wildflowers resulting in a loss of grassland habitat.
- Zone 3:** Ditch clearance every 1-5 years, depending on the ditch
- Zone 4:** Hedge bank is not the responsibility of the DOI and will not be cut unless safety and/or visibility is a concern.

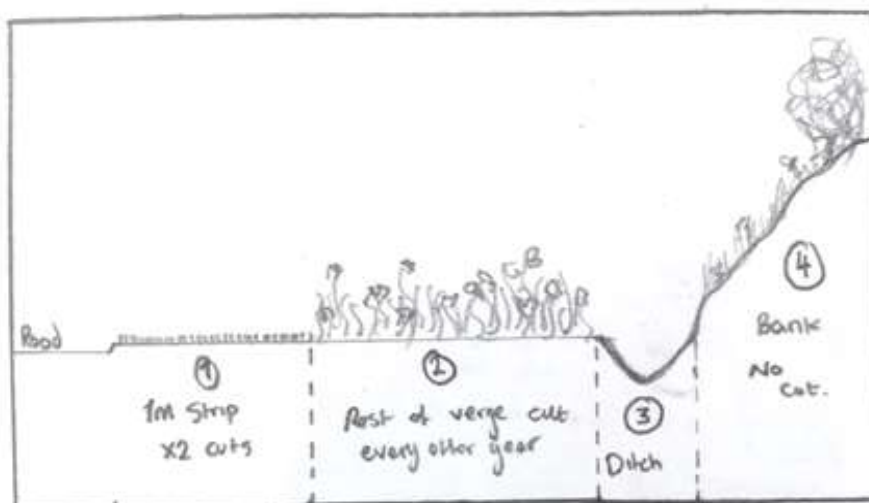


Figure 2. Ideal cutting regime for verges over 1m according to Angela Scott 'Road Verge Survey Project Report 1997'

Verges less than 1m wide will have different management practices in place. These verges usual consist of hedge banks and a small section of verge. As stated above, the DOI does not own the hedge bank (unless a safety concern) therefore it should be left for the landowner. The small section beneath the hedge bank should be cut up to twice a year.

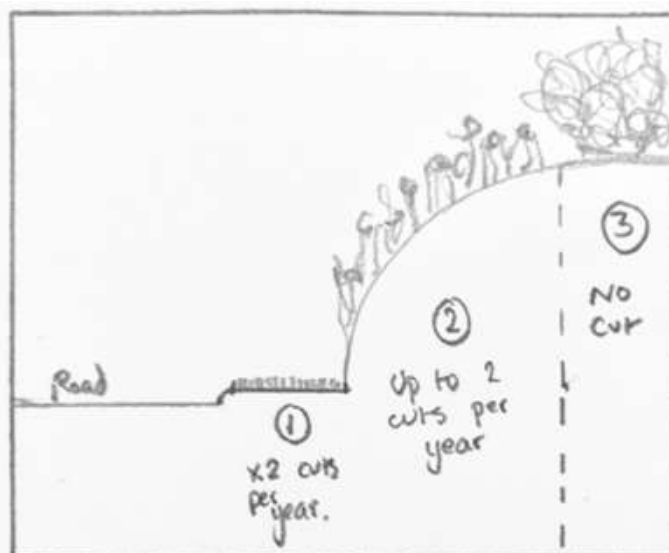


Figure 3. Ideal cutting regime for verges under 1m in width according to Angela Scott 'Road Verge Survey Project Report 1997'

All grass cuttings should be removed from site. Do not leave cuttings to rot down on verges as they may lead to two key disturbances:

- (1) They tend to smother vegetation, not allowing delicate species to establish themselves, such as wildflower species.
- (2) They can cause a build-up of nutrients which encourages nutrient demanding species such as, docks, nettles, thistles and hogweed, to become more established. Thus, it reduces the species diversity along the verge(s).

Therefore, all cuttings should be removed. However, this can only be done by hand and is time consuming so this practice should be left to the most sensitive verges.

In other circumstances, if there are only reduced cuttings from the work, they can be left on site – to allow nutrients to return to the ground – as long as cuttings don't smother the vegetation below as this would significantly reduce biodiversity on the land.

Grass cuttings must be cleared from pavement and roads.

Herbicides and Pesticides

Herbicides and pesticides reduce species diversity significantly. Use of these should be restricted unless vegetation is likely to cause damage by encroaching onto the road surface.

It is acknowledged the need to control weeds on roads and footpaths and therefore impact on surrounding environment should be considered (e.g. avoiding using near sensitive areas where possible).

Ditch Management

Ditches are key habitats for an array of wildlife and provide corridors that allow species to move between different areas. A little-and-often approach is more cost-effective and ecologically sound when discussing ditch management.

Ditch banks should be cut between 1st September and 1st April to avoid disturbing nesting wildlife. Work must be conducted on one bankside only, using appropriately sized and careful operation of machinery to avoid damage to the bankside and alter the ditch levels. Furthermore, rotational management should be in place. Clearing short sections at a time will allow recolonization to occur.

Other actions to ensure the ditches are maintained correctly include:

- Never cut both banks of a ditch in the same year
- Leave managed bank sections a suitable time before managing again.

Similar to hedgerows, varied bankside vegetation is crucial for biodiversity so ensure variation such as shrubbery and/or wild or untouched ditches occur. Finally, slubbings or cut vegetation must not be left in or next to the bankside.

Further guidelines to be aware of include the monitoring and control of both aquatic and terrestrial invasive species. For example, Japanese Knotweed (Figure 3) should not be touched but reported directly to DEFA. To ensure water quality, the DOI must follow farming regulations such as stopping manure, fertiliser or soil unnecessarily getting into water bodies – this includes herbicides.

Design of Infrastructure

Aim

The aim of this section is to introduce elements for designers to implement into their work in future projects. This guideline highlights the need for any development or infrastructure project that can have a significant negative impact on the environment to include measures that avoid, mitigate or compensate for these impacts.

Measures to implement

Culverts

Although not designed for animal passage, culverts are ubiquitous features in road and rail corridors. They channel water past and/or under obstacles providing freshwater, wetlands and ditch habitats. They are created in numerous shapes, the recommended shapes being: circular, box, elliptical, pipe arch and arch. Culverts can provide important habitat linkage, however, they must be placed at more frequent intervals (based on ecological data) and have vegetative cover present near the entrance to enhance passage by small mammals and amphibians.

Bat Boxes

Infrastructure has a drastic impact on bat populations from destroying foraging grounds to bat roosts in buildings or trees. More projects are now implementing bat boxes/ roosts into their designs such as, bridges. For example, Pulrose Bridge (2022) implemented bat boxes into the bridge design to compensate for the damage inflicted onto bat populations on the island. Boxes can be hung underneath new bridges and include a series of thin crevices where bats can roost.

Bird Boxes

It is recommended bird boxes of various sizes and shapes should be installed around the area to attract a range of bird species where practical. Locally sourced/ made boxes are also recommended and should be installed – in areas of minimum disturbance to compensate for the removal of vegetation.

Amphibians and Reptiles

Structures such as culverts, rainwater pipes with side cavities, small underpasses and ducted corridors are all recommended for amphibians and reptiles to use for habitat linkage, other than passing over highways or roads.

All these structures must be above flood water level and clear of run-off zones. For amphibians and reptiles, humid conditions are favourable with dense and diverse vegetation, some sunny clearings and stone piles around the entrance of the passage.

Pollinators

Pollinators such as bees and butterflies are critical to food supply and the health of ecosystems. They require foraging grounds, breeding grounds, nesting areas and wildlife corridors linking habitats together. Effective management of roadsides are key to enhancing and restoring native roadside vegetation and incorporating pollinator habitats into future roadside landscape design. Not only is it a cost-effective project but also supports native Manx vegetation and creates more aesthetically pleasing roadside verges. Native wildflowers along roadside bank are highly recommended and should be managed by judicious mowing with no herbicides.

Signage

More signage highlighting sensitive verges and/or conservation areas along the highway should be implemented to educate the public and other authorities who may do work. In addition, signage indicating wildlife crossing should be brought into places where a high frequency of roadkill's are found (data would need to be looked into further).

Cattle grids

When small mammals or birds fall into the pit beneath a cattle grid, the near-vertical walls beneath the grid are too steep for the animal to escape. Therefore, it is recommended an escape ramp is implemented into cattle grid design.

A simple slope of approx. 20 degrees should be installed made of concrete, wood or metal and approx. 200mm wide depending on grid style in one corner of the pit – ideally an 'outer' corner to prevent cattle/sheep using it. The surface should be rough to enable the animal to gain grip for escape. If the design of the grid is sectionalised, additional ramps must be added to ensure the entire cattle grid is covered in case any animals are trapped.

The *British Standard 4008:1973* contains information on cattle grids. *FRCA* (or formerly *ADAS*) can provide full details on cattle grid design including specifications for escape ramps.

Infrastructure Materials

One of the major issues with infrastructure is the impact it has on the surrounding landscape as a pollution source. Grey infrastructure is an aging concept and its existing capacity is decreasing. Green infrastructure systems should be implemented into design wherever possible to reduce infrastructure impact on the landscape. Runoff is a huge cause of water pollution and introducing greener design elements would not only filter and absorb runoff where it falls but also introduce more aesthetically pleasing infrastructure to the island.

Local Potential and Recycled materials

The Isle of Man could introduce more locally produced building material and/or recycled materials into construction. However, more research must be done to determine the scale at which it could be implemented.

Road planings represent a large potential for reuse of waste materials, with planings currently used to improve unbound surfaces. Other areas have started reusing planings as part of the mix process for bound materials, representing energy and material savings. This could be investigated in future quarry plant reviews.

Legally Protected Species

Plants

Isle of Man Cabbage



Figure 1. Isle of Man Cabbage (*Coincya manesis*)

Photo: ©RWD

Listed as a nationally scarce British species, the Isle of Man Cabbage was once abundant. The plant prefers sandy, loamy and/or clay well-drained soils. It can grow in acidic, neutral

or alkaline soils in semi-shade but needs wind exposure or other erosion that prevents thick vegetation cover. It can often be found growing along footpaths, hedgerows and coastal areas. The orange-tip butterfly regularly uses it as a food source.

Shepherd's cress



Figure 2. Shepherd's Cress (*Teesdalia nudicaulis*)

Photo: English Wild Flowers, Keith Jones

The flowering season for this plant is between April and October. It is thinly scattered around the island but prefers acidic, sandy habitats. It's commonly found on heaths and dunes. It is a sensitive plant and is declining due to invasion by more vigorous plant species, it also has a short-lived seed bank.

Heath spotted orchid



Figure 3. Heath spotted orchid (*Dactylorhiza maculate*)

Photo: Plantlife

Although the conservation status is of least concern, the heath spotted orchid is still a protected species. Its colour varies in shades of purple, white and pale pink and is usually

found in habitats such as woodlands, (acidic) grassland, wetlands and uplands. The flowering season is May to August. It is also known as the moorland spotted orchid.

Northern marsh orchid



Figure 4. Northern marsh orchid (*Dactylorhiza purpurella*)

Photo: Plantlife and first-nature.com

Again, like above the conservation status is green or least concern and varies in purple shades. This particular orchid can be found on coastal habitats or in neutral to alkaline dune-slacks, marshes, wet meadows and ditches. The flowering season is May to July.

Common spotted orchid



Figure 5. Common spotted orchid (*Dactylorhiza fuschii*)

Photo: English Wildflowers, Keith Jones

The flowering season of this orchid is May to August. The conservation status again is of least concern. This species can be found in deciduous woodland, scrub, grassland, dunes, and heaths and by railways, road and footpaths.

Common twayblade



Figure 6. Common twayblade (Listera ovata)

Photos: English Wildflowers, Keith Jones, WildlifeTrusts.org and Plantlife

Twayblade has green or least concern conservation status, yet is still a protected species on the Isle of Man. The flowering season is May to July and can be seen in woodland and grassland habitats specifically wet woods, dunes and pastures. It is also common in scrub and areas with calcareous soils (alkaline)

Important to note: All orchid species on the Isle of Man are protected

Animals – Bats

Brown long-eared bat



Figure 7. Brown long-eared bat (*Plecotus auritus*)
Photo and Diagram: Manx Wildlife Trust and Manx Bat Group

Widespread throughout the island, the brown long-eared bat tends to colonise in older buildings near trees but can be found in grassland, heathland and moorland, woodlands and towns & gardens and hedgerows especially for foraging grounds. Can be seen from April to October

Daubenton's bat

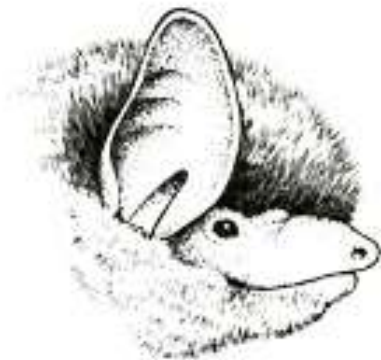


Figure 8. Daubenton's bat (*Myotis daubentonii*)
Photo and Diagram: Manx Bat Group and the Woodland Trust

Often called the water bat, this species often roosts in trees, tunnels or bridges which are generally near water. Can be seen from April to October in freshwater and woodland habitats.

Leisler's bat



Figure 9. *Leisler's bat (Nyctalus leisleri)*

Photo and Diagram: The Woodland Trust and Manx Bat Group

This is the biggest species of bat on the Isle of Man and can be seen from March to October. It roosts in holes/cracks/crevices in trees as well as buildings and bat boxes. Most importantly, in the winter Leisler's bats mainly hibernate in tree holes (occasionally in buildings or underground) so checks must be made before any works are conducted.

Natterer's bat (*Myotis nattereri*)



Figure 10. *Natterer's bat (Myotis nattereri)*

Photo and Diagram: Manx Bat Group and the Woodland Trust

This species favours roosts in old buildings and trees and can be seen in March to November in woodland and farmland habitats. It often winters in underground caves or tunnels or even small rock crevices in small groups or alone.

Pipistrelle bat (*Pipistrellus pipistrellus*)



Figure 11. *Pipistrelle bat (Pipistrellus pipistrellus)*

Photo and Diagram: the Woodland Trust and Manx Bat Group

The pipistrelle bat is the most common species on the island. They can be seen from April to October in varied habitats: grassland, heathland and moorland, farmland, wetlands, woodland and towns & gardens. They roost in tree holes/cracks/crevices as well as bat boxes and roof spaces in buildings. They hibernate from November to April so checks must be done before any work is undertaken.

Soprano pipistrelle bat (*Pipistrellus pygmaeus*)



Figure 12. *Soprano pipistrelle bat (Pipistrellus pygmaeus)*

Photo and Diagram: Manx Bat Group and Bristol University

In summer, this species roosts in cracks and crevices in new and old buildings, behind panelling, shutters and eaves. However, they can also be found in bat boxes and trees. In winter, trees and buildings are preferred spots. Both times of the year they will be found in relatively large colonies.

Whiskered bat (*Myotis mystacinus*)

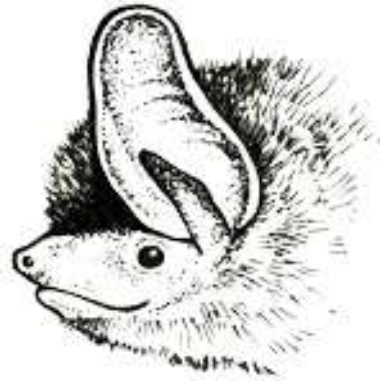


Figure 13. Whiskered bat (*Myotis mystacinus*)

Photo and Diagram: The Wildlife Trusts and Manx Bat Group

The Whiskered bat species is not very numerous in the Isle of Man but is very particular in their preferred habitat. Between April and October, this species can be found in woodland and towns & garden habitats. They frequently forage along hedgerows or woodland edges. They often hibernate in caves and tunnels over winter.

Animals - Other Mammals

Pygmy shrew (*Sorex minutus*)



The pygmy shrew can be seen all year-round and are in most habitats around the island. These habitats include; grassland, heathland and moorland, farmland and hedgerows, wetlands, woodlands and towns & gardens. They are solitary animals whose home ranges/territories vary from 500-2000 square metres depending on the habitat.

Figure 14. Pygmy shrew (*Sorex minutus*)

Photo: Mammal Society, ©Becky Haywood

European hedgehog

Hedgehogs are listed vulnerable to extinction on the IUCN Red List and are protected species on the island. They can be seen from April to October and are common all over the island. They inhabit: grassland, heathland and moorland, farmland, woodland and towns & gardens.



Figure 15. *European hedgehog (Erinaceus europaeus)*
Photo: Manx Wildlife Trust

Polecat (*Mustela putorius*)



Figure 16. *Polecat (Mustela putorius)*
Photo: Manx Wildlife Trust

Polecats can be seen all year-round. They are widespread in a range of habitats including: grassland, farmland, hedgerows, wetlands and woodlands. Den sites are in lowland wooded habitats, marshes, along riverbanks or farm buildings or in disused or taken rabbit burrows. When moving around they like to use habitat corridors such as hedgerows or woodland edges.

Animals - Amphibians and Reptiles

Common frog

Seen between February and October, common frogs are 8-13cm long and found in a range of habitats. Grassland, heathland and moorland, freshwater, farmland and hedgerow (ditches too), wetlands, woodlands and towns & gardens. They breed in ponds during spring and spend the rest of their time feeding in woodlands, gardens, grassland and hedgerows.

During winter, common frogs 'hibernate' - or become less active - under rocks, in compost heaps or underwater in mud and vegetation.



Figure 17. Common frog (*Rana temporaria*)

Photo: Manx Wildlife Trust

Lizards

Common lizards are a protected species on the Isle of Man.



Figure 18. Common lizard

Photo: Manx Wildlife Trust

Animals – Birds

In the period of 1st March to the 31st August, all nesting birds are protected under the *Wildlife Act 1990*. Therefore, any damage and/or injury inflicted on to nesting birds, their nest and/or eggs/dependent young by anyone is an offence. Thus, the DOI already avoid undertaking any works in this period unless necessary for maintenance and/or safety.

Below is a list of *some* bird species the Department may encounter. The list highlights the varied habitats and locations nesting and foraging birds' use that may be damaged if checks aren't conducted before works.

FARMLAND & HEDGEROWS – Lesser Whitethroat and Willow Warbler



Figure 19. (Left) Lesser whitethroat (*Sylvia curruca*) and (right) the Willow warbler (*Phylloscopus trochilus*)
Photos: The Wildlife Trusts

Both these species can be found from April to September and are widespread summer visitors. They live in a range of habitats: grassland, freshwater and wetlands, woodlands, towns & gardens and farmland and hedgerows. However, farmland and hedgerows are where they both mainly set up their nests. Lesser whitethroats nest high in shrubs and hedges in dense vegetation and woodland edges. Willow warblers nest low in trees and low in dense vegetation on the ground. They are normally found near or in trees such as birch, willow and alder.



Figure 20. (Left) Snipe (*Gallinago gallinago*) and (right) the Red grouse (*Lagopus lagopus*)
Photos: The Wildlife Trusts

HEATHLAND AND MOORLAND – Snipe and Red Grouse

Both these species can be found all year round. The snipe is a wading bird and prefers marshes, wet grassland and moorland (but can be found in other habitats too), whereas the red grouse prefers upland heathland and moorland feeding on heather. Snipes have simple scrapes as nests whereas red grouse nest on the ground in hollows lined with grass.

WOODLAND – Great spotted woodpecker and Goldfinch



Figure 21. (Left) Great spotted woodpecker (*Dendrocopos major*) and (right) the Goldfinch (*Carduelis carduelis*)
Photos: The Wildlife Trusts

Both these species can be found on the island all year round. The Great spotted woodpecker predominantly lives in woodlands, urban parks and gardens and nests in holes it's excavated in trees. The Goldfinch inhabits all listed habitats in this document – other than freshwater. They nest in areas with scattered trees and shrubs in loose colony structures. They predominantly nest in woodlands, hedgerows and farmland boundaries.

WETLANDS AND FRESHWATER – Lapwing and Kingfisher



Figure 22. (Left) Lapwing (*Vanellus vanellus*) and (right) the Kingfisher (*Alcedo atthis*)
Photos: The Wildlife Trusts

Both the Lapwing and Kingfisher can be seen all year round. The Lapwing nests in simple scrapes in mud and sand areas in lowlands. They can be seen in multiple habitats other than woodland and towns/gardens. The Kingfisher can also be seen in multiple habitats but predominantly found in freshwater or wetlands areas that have good fishing grounds in the waterways. Their nests are burrow-like alongside waterways.

GRASSLAND – Golden plover and Grasshopper warbler

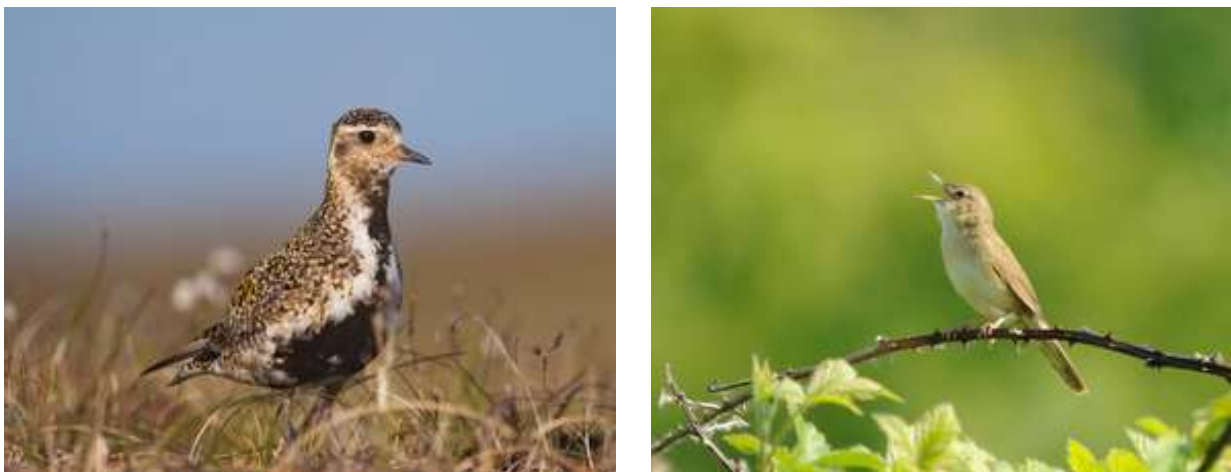


Figure 23. (Left) Golden plover (*Pluvialis apricaria*) and (right) the Grasshopper warbler (*Locustella naevia*)

Photos: The Wildlife Trusts

The golden plover can be seen all year round in upland moorland and grassland. It nests in open ground among heather and grass. The grasshopper warbler however, can only be seen from April to August. Its conservation status is red and lives in grassland and reedbeds. It nests in scrubs and reedbed – with the main threat to this species being habitat destruction. Caution must be taken when in or near grassland.

TOWNS & GARDENS – House sparrows and Starlings



Figure 24. (Left) House sparrow (*Passer domesticus*) and (right) the Starling (*Sturnus vulgaris*)
Photos: The Wildlife Trust and the Woodland Trust

Both these species can be seen all year round. The house sparrow is an opportunistic bird and lives in colonies. It nest in holes and crevices in buildings, among ivy or other bushes/hedges as well as nest boxes. It is a widespread species predominantly living in urban settings but can be found in grasslands, farmlands and woodlands. The starling has red conservation status. It inhabits all habitats but mainly in urbanised areas. They're often in large flocks and have untidy nests in holes in trees or buildings

Case Studies

A14 Cambridge to Huntingdon 2016 - 2020

An improvement scheme run by National Highways which aims to reduce the impact on the surrounding landscape. They first identified species at/ on the site of interest in order to implement the necessary design elements. Overall 24 wildlife tunnels were built across the site, offering a safe place for wildlife to cross roads. In addition, directional planting helped direct animals toward these tunnels.

Over 1.05 Sq. miles of new and varied habitats were built in 18 areas: ponds, log piles, safe spaces, water areas, bird and bat boxes, grasslands, wildflower areas and hedgerows. The project also ensured native tree and shrub species were planted. Logs and deadwood areas were also incorporated and buried partially for insects, invertebrates and fungi to thrive.

Any trees that were removed were replaced with the ratio of 2:1, so, for every tree lost 2 were planted in its place. Protection was also in place for seed banks and harvesting seed schemes were completed by volunteers to secure future regeneration.

Finally, to reduce their environmental footprint, National Highways several initiatives: Energy used was generated by renewable sources, local materials were used. Non-drinking water was used for construction purposes and hybrid generators, solar-powered floodlights and hydrogen powered vehicles were also used.

More information on this project can be found via the link below:

<https://nationalhighways.co.uk/our-roads/a14-cambridge-to-huntingdon/environment/>

Lower Thames Crossing (Future Project estimated 2024 - 2030)

National Highways have proposed to build one of the greenest roads ever built in the UK. To offset the impact of constructing a new road network, over 1 million trees will be planted as well as 200% more woodland, 40% more ponds, 50 miles of new hedgerows and 4 miles more ditches. In addition, a new community woodland of approx. 95 hectares will be designed, approx. 40 miles of active travel routes installed, public parks and green infrastructure elements incorporated. Carbon neutral construction is also an idea they are exploring for this project.

More information on this proposed project can be found via the link below:

<https://nationalhighways.co.uk/our-roads/lower-thames-crossing/environment/>

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Appendix 1

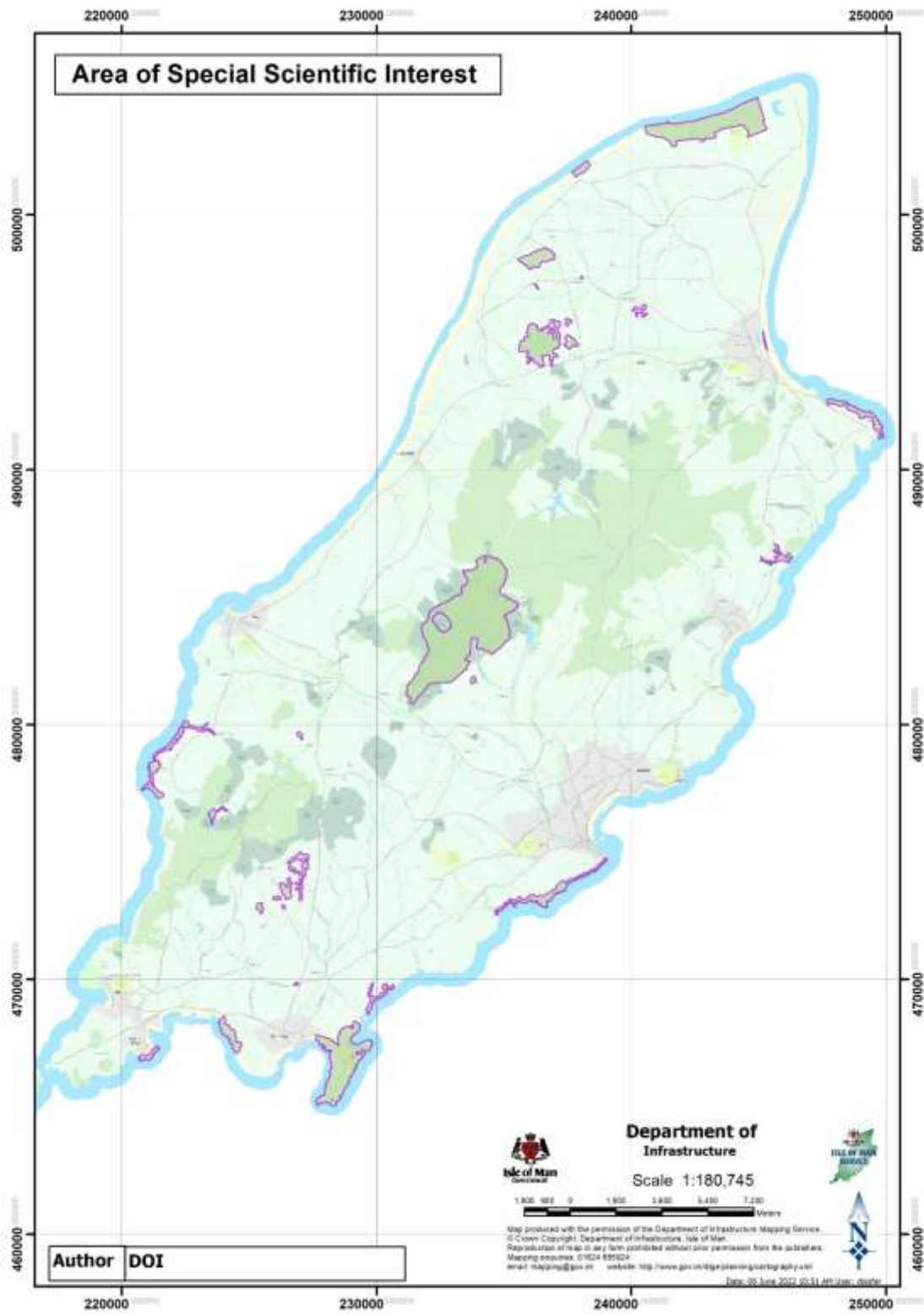


Figure 25. Map highlighting Areas of Special Scientific Interest (SSI) on the Isle of Man as of 2022

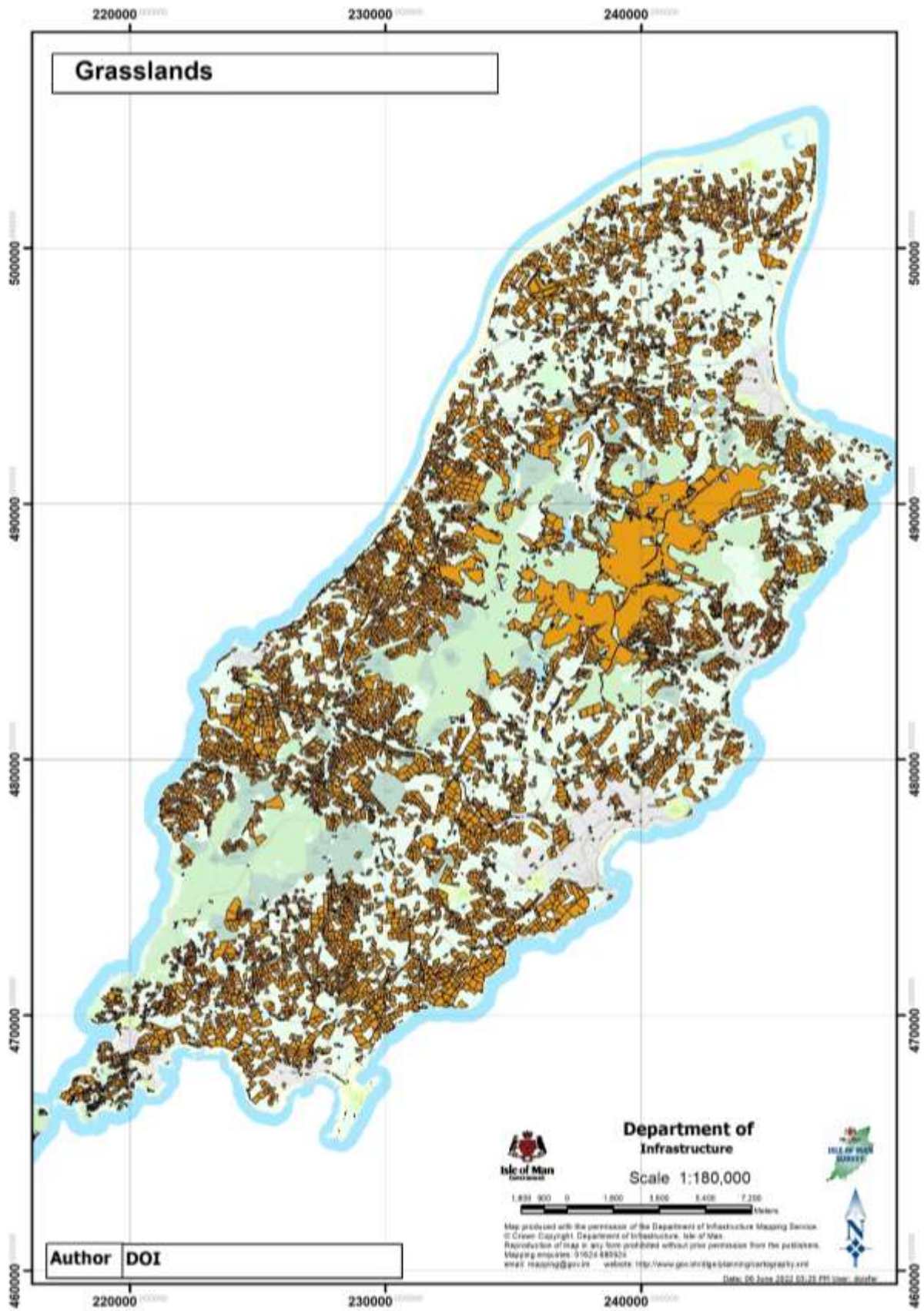


Figure 26. Map highlighting grassland habitats on the Isle of Man as of 2022

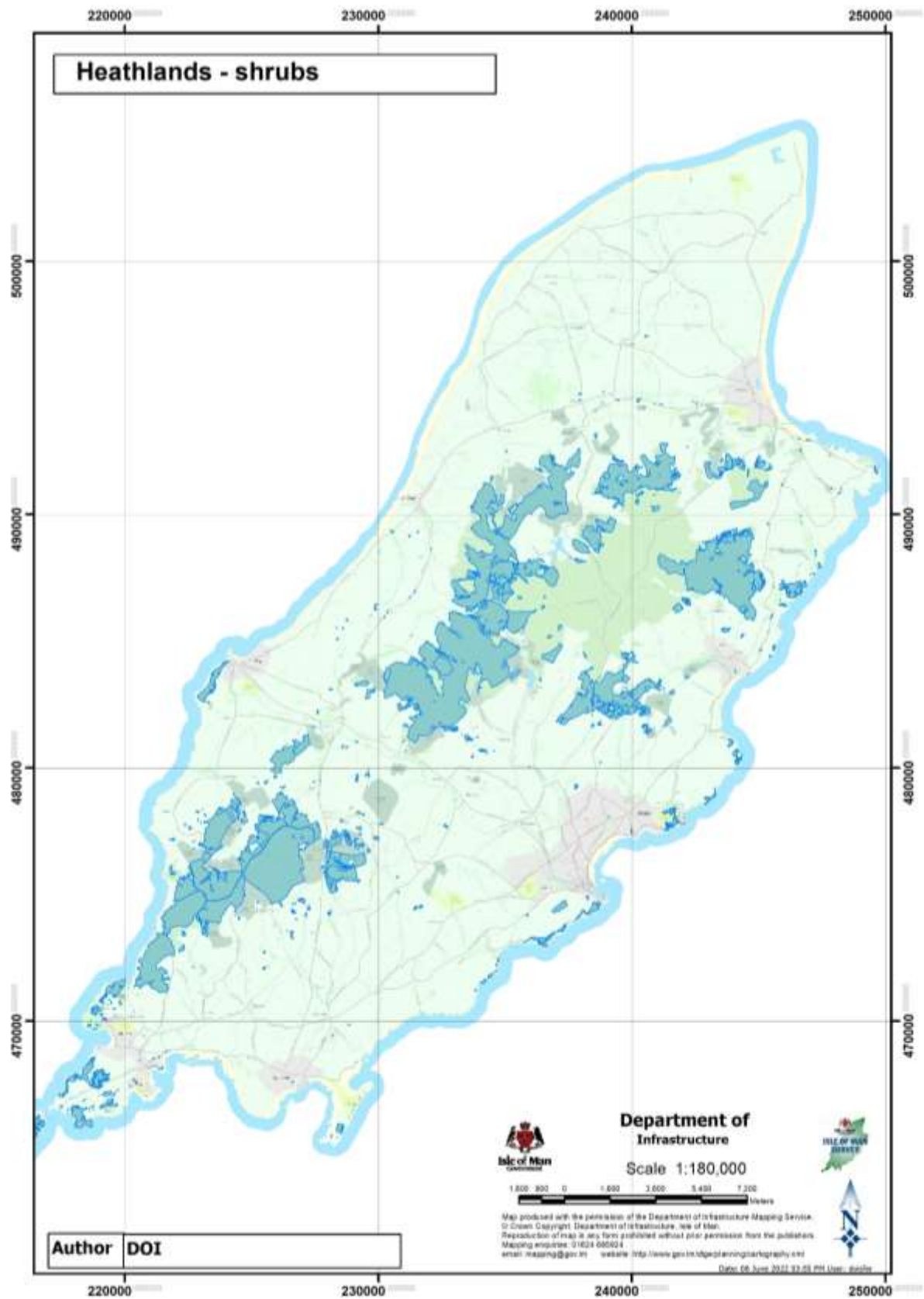


Figure 27. Map highlighting heathlands and shrub habitats around the Isle of Man as of 2022

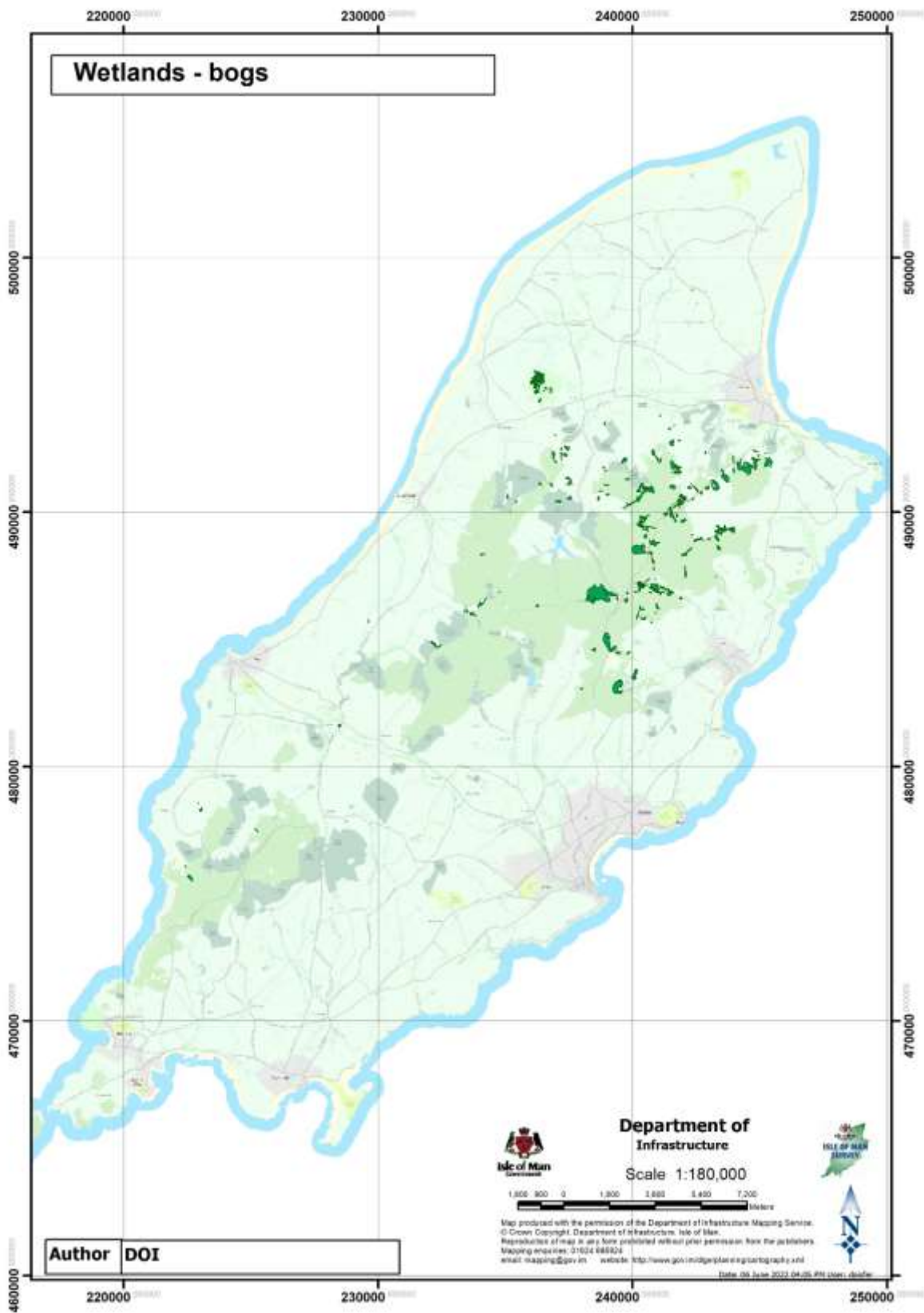


Figure 28. Map highlighting wetland and bog habitats on the Isle of Man as of 2022

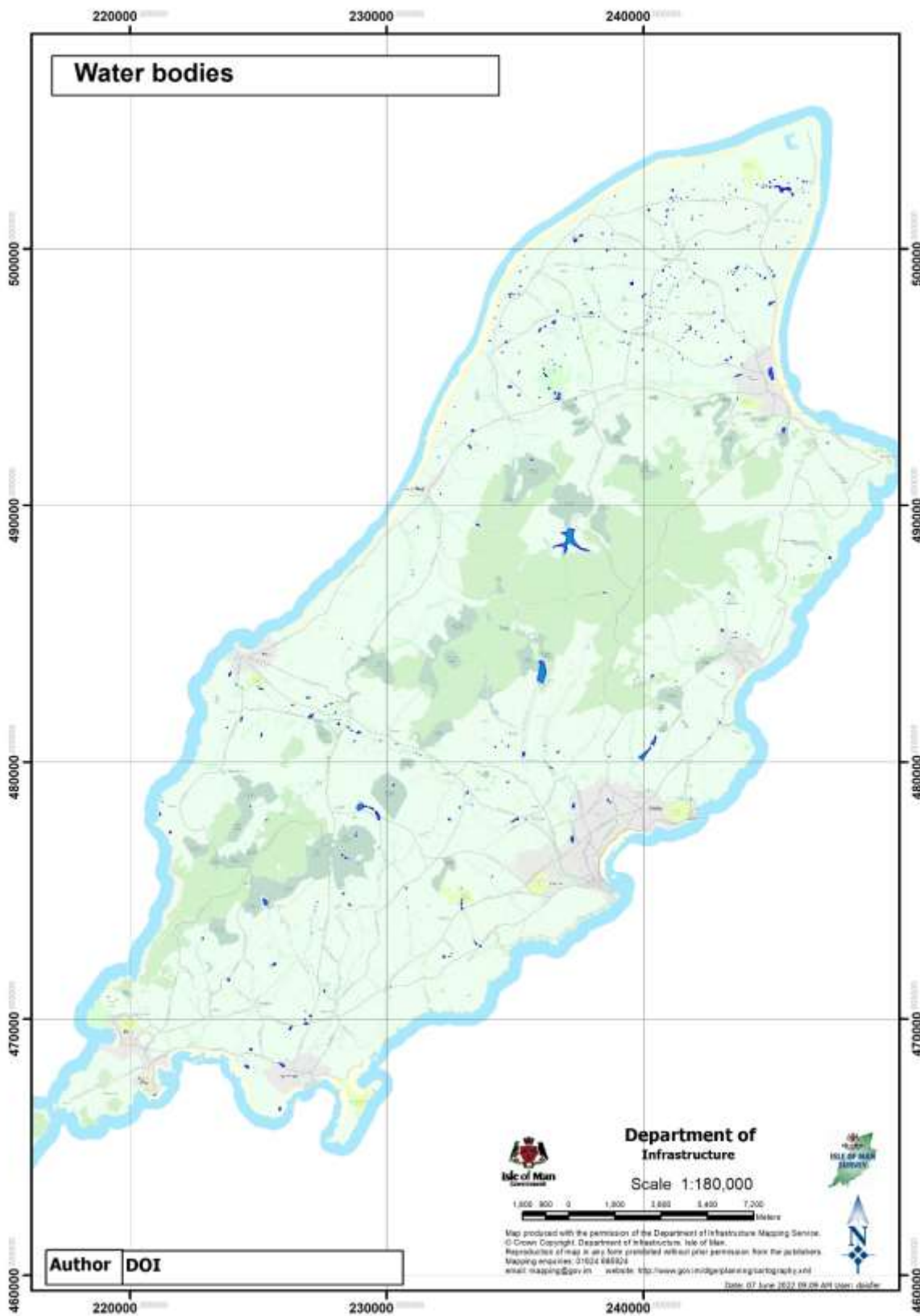


Figure 29. Map highlighting water body habitats on the Isle of Man as of 2022

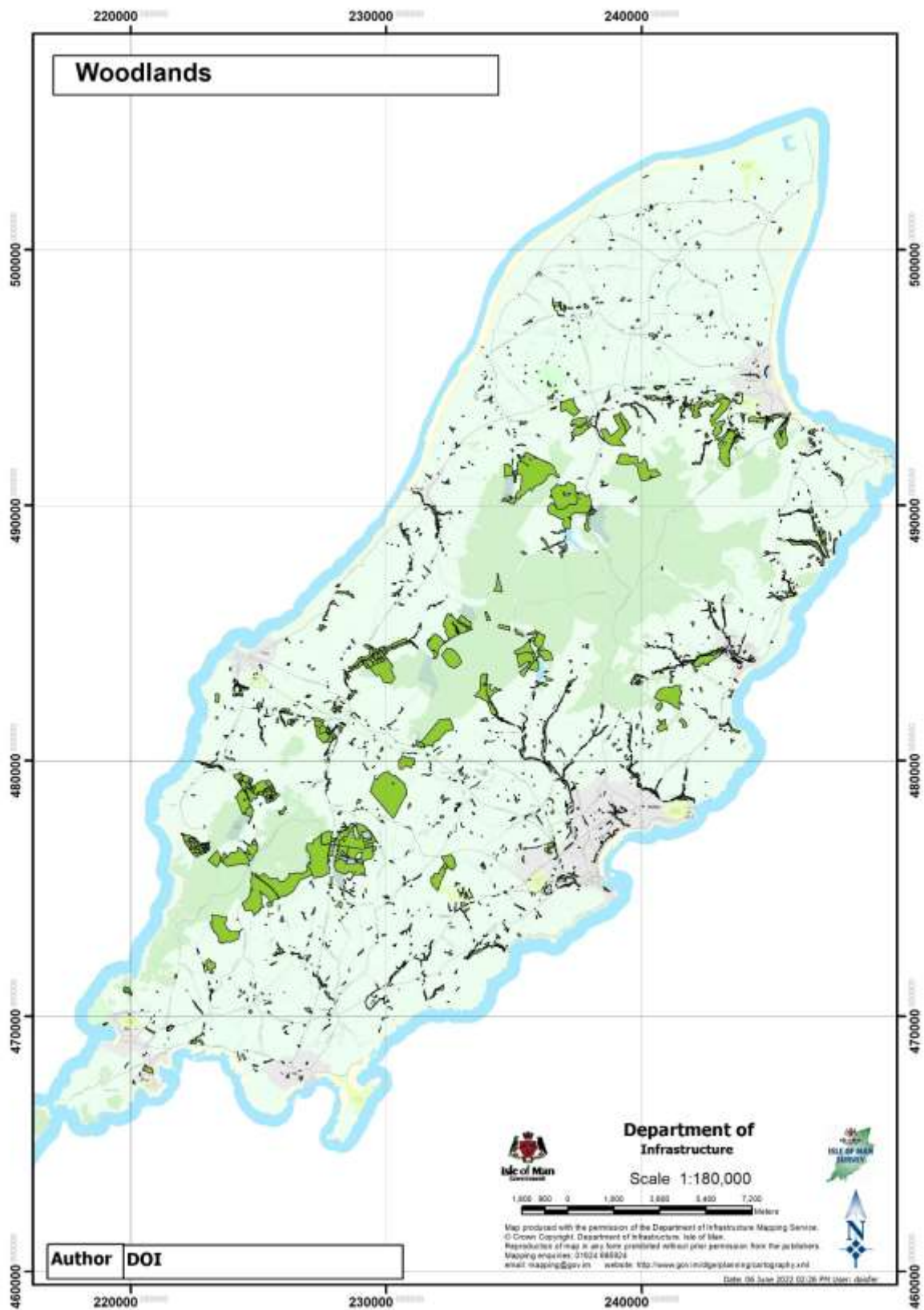


Figure 30. Map highlighting woodland habitats on the Isle of Man as of 2022

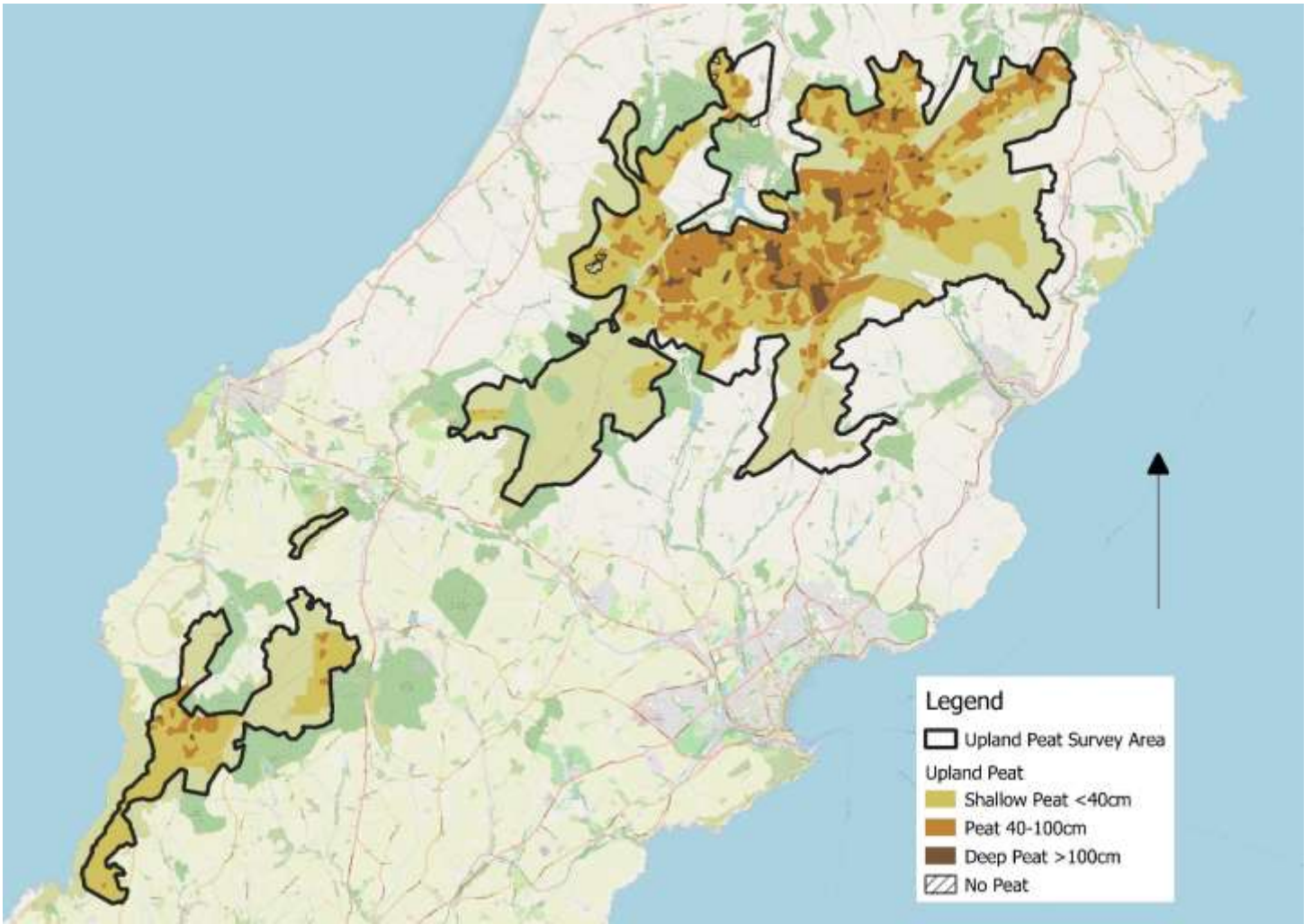


Figure 31. Map highlighting peatland habitats on the Isle of Man as of 2022

Appendix 2

SPECIES		HABITAT		STATUS	NOTES
	Scientific Name	Rivers & Harbours	Still Freshwater		
Black-headed gull	<i>Chroicocephalus ridibundus</i>	X	X	Red	
Canada goose	<i>Branta canadensis</i>	X	X	N/A	
Common gull	<i>Larus canus</i>		X	Amber	
Common sandpiper	<i>Actitis hypoleucos</i>	X	X	Amber	Migratory
Common tern	<i>Sterna hirundoo</i>		X	red	Migratory
Coot	<i>Fulica atra</i>		X	Amber	
Cormorant	<i>Phalacrocorax carbo</i>	X	X	Amber	
Dipper	<i>Cinclus cinclus</i>	X		Locally Extinct	Extinct
Gadwall	<i>Anas strepera</i>		X	Amber	
Goldeneye	<i>Bucephala clangula</i>		X	Amber	
Goosander	<i>Mergus merganser</i>	X		Amber	
Great black-backed gull	<i>Larus marinus</i>	X		Red	
Grey heron	<i>Ardea cinerea</i>	X	X	Amber	
Grey wagtail	<i>Motacilla cinerea</i>	X	X	Amber	
Greylag goose	<i>Anser anser</i>	X	X	Green	Feral population is considered invasive
Herring gull	<i>Larus argentatus</i>	X	X	Red	
Hooded crow	<i>Corvus cornix</i>	X		Green	
Kingfisher	<i>Alcedo atthis</i>	X		Red	
Little egret	<i>Egretta garzetta</i>	X		Amber	
Little grebe	<i>Tachybaptus ruficollis</i>	X	X	Amber	
Mallard	<i>Anas platyrhynchos</i>	X	X	Amber	
Marsh harrier	<i>Circus aeruginosus</i>		X	Green	

Moorhen	<i>Gallinula chloropus</i>	X	X	Amber	
Mute swan	<i>Cygnus olor</i>	X	X	Amber	
Osprey	<i>Pandion haliaetus</i>		X	Green	Migratory
Oystercatcher	<i>Haematopus ostralegus</i>	X		Red	
Pied wagtail	<i>Motacilla alba</i>	X		Green	
Pink-footed goose	<i>Anser brachyrhynchus</i>		X	Amber	
Pintail	<i>Anas acuta</i>		X	Amber	
Pochard	<i>Aythya ferina</i>		X	red	
Red-breasted merganser	<i>Mergus serrator</i>	X		Amber	
Redshank	<i>Tringa totanus</i>	X		Red	
Reed bunting	<i>Emberiza schoeniiclus</i>		X	Amber	
Reed warbler	<i>Acrocephalus scirpaceus</i>		X	Amber	
Sand martin	<i>Riparia riparia</i>		X	Amber	
Sedge warbler	<i>Acrocephalus schoenobaenus</i>		X	Amber	
Shag	<i>Gulosos aristotelis</i>	X		Red	
Shelduck	<i>Tadorna tadorna</i>		X	Amber	
Shoveler	<i>Anas clypeata</i>		X	Amber	
Snipe	<i>Gallinago gallinago</i>		X	Red	
Teal	<i>Anas crecca</i>		X	Red	
Tufted duck	<i>Aythya fuligula</i>		X	Amber	
Water rail	<i>Rallus aquaticus</i>		X	Red	
Wigeon	<i>Anas penelope</i>		X	Green	
Willow warbler	<i>Phylloscopus trochilus</i>		X	Amber	Migratory

Table 1. Bird species found in rivers, harbours and still freshwater habitats around the Isle of Man along with their conservation status.

SPECIES		HABITAT		STATUS	NOTES
	Scientific Name	At Sea	Coastal		
Arctic skua	<i>Stercorarius parasiticus</i>	X	X	Green	Migratory
Arctic tern	<i>Sterna paradisaea</i>	X	X	Red	
Bar-tailed godwit	<i>Limosa lapponica</i>		X	Red	Migratory
Blackbird	<i>Turdus merula</i>		X	Green	
Black-headed gull	<i>Chroicocephalus ridibundus</i>	X	X	Red	
Black-tailed godwit	<i>Limosa limosa</i>		X	Red	Migratory
Black-throated diver	<i>Gavia arctica</i>	X	X	Amber	
Brent goose	<i>Branta bernicla</i>		X	Amber	
Carrion crow	<i>Corvus corone</i>		X	Green	
Chough	<i>Pyrhacorax</i>		X	Amber	
Common gull	<i>Larus canus</i>	X	X	Amber	
Common sandpiper	<i>Actitis hypoleucos</i>		X	Amber	Migratory
Common scoter	<i>Melanitta nigra</i>	X	X	Amber	
Common tern	<i>Sterna hirundo</i>	X	X	Red	Migratory
Coot	<i>Fulica atra</i>			Amber	
Cormorant	<i>Phalacrocorax carbo</i>	X	X	Amber	
Curlew	<i>Numenius arquata</i>		X	Red	
Dunlin	<i>Calidris alpina</i>		X	Amber	
Goosander	<i>Mergus merganser</i>		X	Amber	
Great black-backed gull	<i>Larus marinus</i>		X	Red	
Great northern diver	<i>Gavia immer</i>	X	X	Amber	
Great skua	<i>Stercorarius skua</i>	X	X	Green	Migratory - Small summer population in recent years
Greenshank	<i>Tringa nebularia</i>	X	X	Green	Migratory
Grey heron	<i>Ardea cinerea</i>		X	Amber	

Grey plover	<i>Pluvialis squatarola</i>		X	Amber	
Grey wagtail	<i>Motacilla cinerea</i>		X	Amber	
Hen harrier	<i>Circus cyaneus</i>		X	Amber	
Herring gull	<i>Larus argentatus</i>		X	Red	
Kestrel	<i>Falco tinnunculus</i>	X	X	Red	
Kingfisher	<i>Alcedo atthis</i>		X	Red	
Knot	<i>Calidris canutus</i>		X	Red	
Lapwing	<i>Vanellus vanellus</i>		X	Red	
Lesser black-backed gull	<i>Larus fuscus</i>		X	Red	
Little egret	<i>Egretta garzetta</i>	X	X	Amber	
Little tern	<i>Sternula albifrons</i>		X	Red	
Mallard	<i>Anas platyrhynchos</i>	X	X	Amber	
Manx shearwater	<i>Puffinus puffinus</i>		X	Amber	
Meadow pipit	<i>Anthus pratensis</i>	X	X	Red	
Merlin	<i>Falco columbarius</i>		X	Red	
Mute swan	<i>Cygnus olor</i>		X	Amber	
Osprey	<i>Pandion haliaetus</i>		X	Green	Migratory
Oystercatcher	<i>Haematopus ostralegus</i>		X	Red	
Peregrine falcon	<i>Falco peregrinus</i>		X	Amber	
Pied wagtail	<i>Motacilla alba</i>		X	Green	
Raven	<i>Corvus corax</i>		X	Amber	
Red-breasted merganser	<i>Mergus serrator</i>		X	Amber	
Redshank	<i>Tringa totanus</i>		X	Red	
Red-throated diver	<i>Gavia stellata</i>		X	Amber	
Ringed plover	<i>Charadrius hiaticula</i>	X	X	Amber	
Rock dove (wild population)	<i>Columba livia</i>		X	Locally Extinct	

Rock pipit	Anthus petrosus		X	Green	
Ruff	Philomachus pugnax		X	Amber	Migratory
Sand martin	Riparia riparia		X	Amber	
Sanderling	Calidris alba		X	Amber	
Shag	Gulosus aristotelis		X	Red	
Shelduck	Tadorna tadorna	X	X	Amber	
Short-eared owl	Asio flammeus		X	Red	
Snow bunting	Plectrophenax nivalis		X	Amber	
Stonechat	Saxicola torquata		X	Green	
Storm petrel	Hydrobates pelagicus		X	Green	
Teal	Anas crecca	X		Red	
Turnstone	Arenaria interpres		X	Amber	
Wheatear	Oenanthe oenanthe		X	Amber	
Whimbrel	Numenius phaeopus		X	Green	Migratory
White-tailed eagle	Haliaeetus albicilla		X	Locally Extinct	
Whitethroat	Curruca communis		X	Green	
Wigeon	Anas penelope		X	Green	
Wren	Troglodytes troglodytes		X	Green	
Yellow wagtail	Motacilla flava		X	Amber	Migratory

Table 2. Bird species found at sea and coastal areas on the Isle of Man along with their conservation status.

SPECIES		HABITAT					
	Scientific Name	Farmland & Hedgerows	Upland/ Heath	Woodland	STATUS	NOTES	
Barn owl	<i>Tyto alba</i>	X			Red		
Black redstart	<i>Phoenicurus ochruros</i>				Amber		
Blackbird	<i>Turdus merula</i>	X	X	X	Green		
Blackcap	<i>Sylvia atricapilla</i>			X	Green		
Black-headed gull	<i>Chroicocephalus ridibundus</i>	X			Red		
Blue tit	<i>Cyanistes caeruleus</i>	X		X	Green		
Brambling	<i>Fringilla montifringilla</i>	X			Amber		
Buzzard	<i>Buteo buteo</i>	X		X	Amber		
Canada goose	<i>Branta canadensis</i>	X			N/A		
Carrion crow	<i>Corvus corone</i>	X	X		Green		
Chaffinch	<i>Fringilla coelebs</i>	X		X	Green		
Chiffchaff	<i>Phylloscopus collybita</i>	X		X	Green		
Chough	<i>Pyrrhocorax pyrrhocorax</i>	X			Amber		
Coal tit	<i>Periparus ater</i>	X		X	Green		
Collared dove	<i>Streptopelia decaocto</i>	X			Green		
Common crossbill	<i>Loxia curvirostra</i>		X	X	Amber		
Common gull	<i>Larus canus</i>	X			Amber		
Corn bunting	<i>Emberiza calandra</i>	X			Locally Extinct		
Corncrake	<i>Crex crex</i>	X			Red		
Cuckoo	<i>Cuculus canorus</i>	X	X		Red		

Curlew	<i>Numenius arquata</i>	X	X		Red	
Dunnock	<i>Prunella modularis</i>	X		X	Green	
Fieldfare	<i>Turdus pilaris</i>	X			Green	
Firecrest	<i>Regulus ignicapillus</i>	X			Green	
Garden warbler	<i>Sylvia borin</i>	X		X	Amber	
Goldcrest	<i>Regulus regulus</i>	X		X	Amber	
Goldfinch	<i>Carduelis carduelis</i>	X		X	Green	
Goosander	<i>Mergus merganser</i>				Amber	
Grasshopper warbler	<i>Locustella naevia</i>	X	X		Red	
Great black-backed gull	<i>Larus marinus</i>	X	X		Red	
Great spotted woodpecker	<i>Dendrocopos major</i>	X		X	Amber	
Great tit	<i>Parus major</i>	X		X	Green	
Greenfinch	<i>Chloris chloris</i>	X		X	Amber	
Grey wagtail	<i>Motacilla cinerea</i>	X			Amber	
Greylag goose	<i>Anser anser</i>	X			Green	
Hen harrier	<i>Circus cyaneus</i>	X	X		Amber	
Herring gull	<i>Larus argentatus</i>	X	X		Red	
Hooded crow	<i>Corvus cornix</i>	X	X		Green	
House martin	<i>Delichon urbicum</i>	X			Amber	
House sparrow	<i>Passer domesticus</i>	X			Amber	
Jack snipe	<i>Lymnocyptes minimus</i>	X	X		Amber	
Jackdaw	<i>Corvus monedula</i>	X			Green	

Kestrel	<i>Falco tinnunculus</i>	X	X		Red	
Lapwing	<i>Vanellus vanellus</i>	X			Red	
Lesser black-backed gull	<i>Larus fuscus</i>	X			Red	
Lesser redpoll	<i>Acanthis cabaret</i>		X	X	Amber	
Lesser whitethroat	<i>Curruca curruca</i>	X			Amber	
Linnet	<i>Linaria cannabina</i>	X			Red	
Long-eared owl	<i>Asio otus</i>	X		X	Red	
Long-tailed tit	<i>Aegithalos caudatus</i>	X		X	Green	
Magpie	<i>Pica pica</i>	X	X	X	Green	
Meadow pipit	<i>Anthus pratensis</i>	X	X		Red	
Merlin	<i>Falco columbarius</i>	X	X		Red	
Mistle thrush	<i>Turdus viscivorus</i>	X	X	X	Amber	
Nightjar	<i>Caprimulgus europaeus</i>		X		Locally Extinct	
Oystercatcher	<i>Haematopus ostralegus</i>	X			Red	
Peregrine falcon	<i>Falco peregrinus</i>		X		Amber	
Pheasant	<i>Phasianus colchicus</i>	X			N/A	
Pied wagtail	<i>Motacilla alba</i>	X			Green	
Pink-footed goose	<i>Anser brachyrhynchus</i>	X			Amber	
Quail	<i>Coturnix coturnix</i>	X			Locally Extinct	
Raven	<i>Corvus corax</i>	X	X		Amber	
Red grouse	<i>Lagopus lagopus</i>		X		Amber	
Red-legged partridge	<i>Alectoris rufa</i>	X			N/A	
Redstart	<i>Phoenicurus ochruros</i>	X			Green	Migratory

Redwing	<i>Turdus iliacus</i>	X		X	Red	
Reed bunting	<i>Emberiza schoeniclus</i>	X	X		Amber	
Ring ouzel	<i>Turdus torquatus</i>		X		Red	Migratory
Ringed plover	<i>Charadrius hiaticula</i>				Amber	
Robin	<i>Erthacus rubecula</i>	X	X	X	Green	
Rook	<i>Corvus frugilegus</i>	X		X	Green	
Sedge warbler	<i>Acrocephalus schoenobaenus</i>	X			Amber	
Short-eared owl	<i>Asio flammeus</i>	X	X		Red	
Siskin	<i>Carduelis spinus</i>			X	Green	
Skylark	<i>Alauda arvensis</i>	X	X		Red	
Snipe	<i>Gallinago gallinago</i>	X	X		Red	
Snow bunting	<i>Plectrophenax nivalis</i>		X		Amber	
Song thrush	<i>Turdus philomelos</i>	X		X	Green	
Sparrowhawk	<i>Accipiter nisus</i>	X		X	Green	
Spotted flycatcher	<i>Muscicapa striata</i>	X		X	Red	
Starling	<i>Sturnus vulgaris</i>	X			Amber	
Stock dove	<i>Columba oenas</i>	X		X	Red	
Stonechat	<i>Saxicola rubicola</i>	X	X		Green	
Swallow	<i>Hirundo rustica</i>	X			Amber	
Tree sparrow	<i>Passer montanus</i>	X			Red	
Treecreeper	<i>Certhia familiaris</i>			X	Green	
Water rail	<i>Rallus aquaticus</i>	X			Red	
Wheatear	<i>Oenanthe oenanthe</i>	X	X		Amber	
Whinchat	<i>Saxicola rubetra</i>		X		Red	Migratory
White-fronted goose	<i>Anser albifrons</i>	X			Amber	
Whitethroat	<i>Curruca communis</i>	X	X		Green	
Whooper swan	<i>Cygnus cygnus</i>	X			Amber	
Willow warbler	<i>Phylloscopus trochilus</i>	X		X	Amber	

Wood warbler	<i>Phylloscopus sibilatrix</i>			X	Amber	Migratory
Woodcock	<i>Scolopax rusticola</i>	X		X	Red	
Woodpigeon	<i>Columba palumbus</i>	X		X	Green	
Wren	<i>Troglodytes troglodytes</i>	X	X	X	Green	
Yellow wagtail	<i>Motacilla flava</i>	X			Amber	Migratory
Yellowhammer	<i>Emberiza</i>	X			Red	

Table 3. Bird species found in/on farmland, hedgerows, upland, heath and woodland on the Isle of Man along with their conservation status.

SPECIES		HABITAT		
	Scientific Name	Towns/ Gardens	STATUS	NOTES
Black redstart	<i>Phoenicurus ochruros</i>	X	Amber	
Blackbird	<i>Turdus merula</i>	X	Green	
Blackcap	<i>Sylvia atricapilla</i>	X	Green	
Black-headed gull	<i>Chroicocephalus ridibundus</i>	X	Red	
Blue tit	<i>Cyanistes caeruleus</i>	X	Green	
Brambling	<i>Fringilla montifringilla</i>	X	Amber	
Brent goose	<i>Branta bernicla</i>		Amber	
Buzzard	<i>Buteo buteo</i>	X	Amber	
Canada goose	<i>Branta canadensis</i>	X	Not assessed	
Carrion crow	<i>Corvus corone</i>	X	Green	
Chaffinch	<i>Fringilla coelebs</i>	X	Green	
Chiffchaff	<i>Phylloscopus collybita</i>	X	Green	
Coal tit	<i>Periparus ater</i>	X	Green	
Collared dove	<i>Streptopelia decaocto</i>	X	Green	
Dunnock	<i>Prunella modularis</i>	X	Green	
Garden warbler	<i>Sylvia borin</i>	X	Amber	
Goldcrest	<i>Regulus regulus</i>	X	Amber	
Goldfinch	<i>Carduelis carduelis</i>	X	Green	
Great spotted woodpecker	<i>Dendrocopos major</i>	X	Amber	
Great tit	<i>Parus major</i>	X	Green	
Greenfinch	<i>Chloris chloris</i>	X	Amber	
Grey heron	<i>Ardea cinerea</i>	X	Amber	
Herring gull	<i>Larus argentatus</i>	X	Red	

Hooded crow	<i>Corvus cornix</i>	X	Green	
House martin	<i>Delichon urbicum</i>	X	Amber	
House sparrow	<i>Passer domesticus</i>	X	Amber	
Jackdaw	<i>Corvus monedula</i>	X	Green	
Long-tailed tit	<i>Aegithalos caudatus</i>	X	Green	
Magpie	<i>Pica pica</i>	X	Green	
Moorhen	<i>Gallinula chloropus</i>	X	Amber	
Peregrine falcon	<i>Falco peregrinus</i>	X	Amber	
Pheasant	<i>Phasianus colchicus</i>		Not assessed	
Pied wagtail	<i>Motacilla alba</i>	X	Green	
Robin	<i>Erithacus rubecula</i>	X	Green	
Rock dove (wild population)	<i>Columba livia</i>	X (feral)	Locally Extinct	
Rook	<i>Corvus frugilegis</i>	X	Green	
Siskin	<i>Carduelis spinus</i>	X	Green	
Song thrush	<i>Turdus philomelos</i>	X	Green	
Sparrowhawk	<i>Accipiter nisus</i>	X	Green	
Spotted flycatcher	<i>Muscicapa striata</i>	X	Red	
Starling	<i>Sturnus vulgaris</i>	X	Amber	
Swift	<i>Apus apus</i>	X	Amber	
Tree sparrow	<i>Passer montanus</i>	X	Red	
Treecreeper	<i>Certhia familiaris</i>	X	Green	
Waxwing	<i>Bombycilla garrulus</i>	X	Green	
Willow warbler	<i>Phylloscopus trochilus</i>	X	Amber	
Woodpigeon	<i>Columba palumbus</i>	X	Green	
Wren	<i>Troglodytes troglodytes</i>	X	Green	

Table 3. Bird species found in towns and gardens on the Isle of Man along with their conservation status.

Classification	Species	Scientific Name	Distribution	When to See
Invertebrates	FLIES	DIPTERA		
	Lesser beefly	<i>Bombylius minor</i>	The Ayres	July-September
	GRASSHOPPERS & CRICKETS	ORTHOPTERA		
	Speckled (or Dotted) bush cricket	<i>Leptophyes punctatissima</i>	Glen Chass (Port St Mary) & Glen Maye	July-October
	Dark bush cricket	<i>Pholidoptera griseoptera</i>	Lonan Coast (mainly Manx Electric Railway between Garwick and South Cape)	July-October
	Lesser mottled grasshopper	<i>Stenobothrus stigmaticus</i>	Langness	July-October
	MOTHS	LEPIDOPTERA		
	Grey moth	<i>Hadena caesia mananii</i>	Coastal brooghs , occasionally inland	May-October
	Scarce crimson and gold moth	<i>Pyrausta sanguinalis</i>	The Ayres	June-July
	CRUSTACEANS	CRUSTACEA		
	Fairy shrimp	<i>Chirocephalus diaphanus</i>	Ephemeral pools (not yet recorded on Island)	N/A
Mammals	BATS	CHIROPTERA		
	Brown long-eared	<i>Plecotus auritus</i>	Widespread	Year-round
	Daubenton's	<i>Myotis daubentonii</i>	Widespread, near water	Year-round
	Leisler's	<i>Nyctalus leisleri</i>	Widespread	Year-round
	Natterer's	<i>Myotis nattereri</i>	Widespread	Year-round
	Pipistrelle	<i>Pipistrellus pipistrellus</i>	Widespread	Year-round
	Soprano pipistrelle	<i>Pipistrellus pygmaeus</i>	Widespread	Year-round
	Whiskered	<i>Myotis mystacinus</i>	Widespread	Year-round

	Lesser horseshoe	<i>Rhinolophus hipposideros</i>	Kentraugh & The Chasms	Year-round
	Nathusius's pipistrelle	<i>Pipistrellus nathusii</i>	River Neb (Peel), Elfin Glen (Ramsey)	Year-round
	SEALS	PINNIPEDIA		
	Grey seal	<i>Halichoerus grypus</i>	Widespread	January - December
	Harbour (or Common) seal	<i>Phoca vitulina</i>	Widespread but less common	January - December
	WHALES AND DOLPHINS	CETACEA		
	Harbour porpoise	<i>Phocoena phocoena</i>	Widespread	Year-round
	Risso's dolphin	<i>Grampus griseus</i>	Widespread - primarily south and east coasts	March-October
	Bottlenose dolphin	<i>Tursiops truncatus</i>	Widespread - primarily east coast	October-March
	Short-beaked common dolphin	<i>Delphinus delphis</i>	Widespread - primarily offshore	June-September
	Minke whale	<i>Balaenoptera acutorostrata</i>	Widespread - primarily west, south and east coasts	May-November
	Humpback whale	<i>Megaptera novaeangliae</i>	Rare	N/A
	Orca	<i>Orcinus orca</i>	Rare	N/A
	Fin whale	<i>Balaenoptera physalus</i>	Rare	N/A
Reptiles & Amphibians	AMPHIBIANS	AMPHIBIA		
	Common frog	<i>Rana temporaria</i>	Widespread	Year-round
	REPTILES	REPTILIA		
	Viviparous (or Common) Lizard	<i>Lacerta vivipara</i>	Widespread	May-September
	Leatherback turtle	<i>Dermochelys coriacea</i>	Rare	N/A
	Loggerhead turtle	<i>Caretta caretta</i>	Rare	N/A
	Kemp's ridley turtle	<i>Lepidochelys kempii</i>	Rare	N/A

	Green turtle	<i>Chelonia mydas</i>	Rare	N/A
	Hawksbill turtle	<i>Eretmochelys imbricata</i>	Rare	N/A
Fish	MARINE FISH	CHONDRICHTHYES		
	Basking shark	<i>Cetorhinus maximus</i>	Widespread - primarily south and west coasts	Summer

Table 4. Other species found around the Isle of Man relevant to any potential future DOI work to be aware of alongside distribution when to see them.

	Species	Scientific Name	When to See	IOM Conservation Status
Fish	Atlantic salmon	<i>Salmo salar</i>	Year-round	Widespread
	Brook lamprey	<i>Lampetra planeri</i>	Year-round	Data deficient. Confirmed in Rivers Dhoo, Sulby and Neb
	Brown trout	<i>Salmo trutta</i>	Year-round	Widespread and common
	European bullhead	<i>Cottus gobio</i>	Year-round	Single occurrence, Kionslieu Reservoir 2021
	European eel	<i>Anguilla anguilla</i>	Year-round	Widespread on IOM. Globally critically endangered
	Minnnow	<i>Phoxinus phoxinus</i>	Year-round	Data deficient
	Rainbow trout	<i>Oncorhynchus mykiss</i>	Year-round	Introduced, non-native species
	River lamprey	<i>Lampetra fluviatilis</i>	Year-round	Data deficient. Confirmed in River Neb
	Sea lamprey	<i>Petromyzon marinus</i>	Year-round	Seen in Manx marine areas, not yet recorded in freshwater
Three-spined stickleback	<i>Gasterosteus aculeatus</i>	Year-round	Data deficient	

Table 5. Fish species found in freshwater and Manx marine waters DOI Highways should be aware of for future potential works.