

Appendix 9A

Ecological Desk Study



1. Desk Study

1.1 Methodology

- 1.1.1 The following desk based assessment was carried out with the aim of identifying potential ecological constraints (excluding birds – see Appendix 8A) to the Proposed Development, following the Chartered Institute of Ecology and Environmental Management (CIEEM) best practice guidelines¹. The exercise was undertaken to obtain existing information relating to relevant ecological features; these are statutory and non-statutory biodiversity sites, habitats and species of principal importance², legally protected and controlled species and other conservation notable species that have been recorded over the previous 10 years (i.e. 2009 to 2019).
- 1.1.2 Table 9A.1 lists the data compiled within the desk study area, which is the Proposed Development boundary and the additional areas of search beyond, and is shown on **Figure 9A.1 Study Area**.

Table 1A.1 Information Relevant to the Desk Study

Ecological feature	Example/description	Study Area
Statutory sites designated under International conventions or European legislation	Wetlands of International Importance (also known as Ramsar sites), Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) ³	The Proposed Development area and within 20km of it.
Statutory sites designated under national legislation	Sites of Special Scientific Interest (SSSIs), National Nature Reserves (NNRs) and Local Nature Reserves (LNRs)	The Proposed Development area and within 2km of it.
Locally designated sites	Often termed as Local Wildlife Sites (LWS), County Wildlife Sites (CWS), Sites of Interest for Nature Conservation (SINC)	The Proposed Development area and within 2km of it.
Scottish Biodiversity List Red listed species⁴ and Legally protected species.	Flora, fauna and habitats of principal importance for the conservation of biodiversity in Scotland. Species recorded on The IUCN Red List of Threatened Species and/or local Red Lists for the UK or relevant sub-units (e.g. regions or counties) and legally protected habitats and species include those listed on Schedules 1, 5 and 8 of the <i>Wildlife and Countryside Act 1981</i> (as amended), those included on Schedules 2 and 5 of the Habitats Regulations. Badger and Hedgerows are provided protection under the Protection of Badgers Act 1992 and the Hedgerows Regulations 1997 respectively	The Proposed Development area and within 2km of it.
Legally controlled species	Legally controlled species include those listed on Schedule 9 of the <i>Wildlife and Countryside Act 1981</i> (as amended).	The Proposed Development area and within 2 km of it.

¹ CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management, Winchester.

² The Scottish Biodiversity List is a list of plants, animals and habitats that Scottish Ministers consider to be of principal importance to biological conservation. <https://www.gov.scot/Topics/Environment/Wildlife-Habitats/16118/Biodiversitylist/SBL>

³ The designations considered in this assessment as European sites include SPAs, SACs and candidate SACs and Sites of Community Importance (SCI); these sites are collectively referred to Natura 2000 sites. Draft SPAs (dSPA), Potential SPAs (pSPA), possible SACs (pSACs), draft SACs (dSAC), Ramsar sites are also considered in line with planning policy.

⁴ Red listed species for the purposes of this assessment refer to those noted using IUCN criteria as being "Near Threatened", "Vulnerable", "Endangered" and "Critically Endangered", and those on present on local Red Lists in the categories "Nationally Scarce" and "Nationally Rare".

- 1.1.3 Table 9A.2 lists the organisations and other sources that have supplied data, together with the nature of that data.
- 1.1.4 Where appropriate, data were drawn from existing ecological records and site information obtained through field surveys conducted in 2010/11 to support the 2012 Stornoway Wind Farm Environmental Statement. Field data collected during this period relates to Phase 1 habitat survey, National Vegetation Classification (NVC), and otter, freshwater pearl mussel, and freshwater invertebrate surveys.

Table 1A.2 Sources of Desk Study Data

Source	Summary of information provided
SNH's interactive map facility at (https://sitelink.nature.scot/home)	Access to data and information on key protected areas across Scotland.
National Biodiversity Network (NBN) gateway's information service (http://data.nbn.org.uk)	Commercially-available records of protected and/or notable species from within the last ten years.
Forestry Commission online map (http://map.environment.scotland.gov.uk/landinformationsearch/lis_map.html);	Extents of woodland and forests (including ancient woodland inventory areas) and FCS approved areas for plantation
Stornoway Wind Farm EIA Report 2012	Contextual material regarding the previous consented wind farm.
Stornoway Wind Farm Variation EIA Report 2016	
Rafferty & Proctor (2011) Stornoway Wind Farm Phase 1 and NVC Habitat Survey, Highland Ecology.	A Phase 1 Habitat and National Vegetation Classification baseline survey of the Stornoway Wind Farm (2011)
Royal Haskoning (2011). Survey of otters <i>Lutra lutra</i> for Lewis Wind Power, Stornoway Wind Farm.	An otter baseline survey of the Stornoway Wind Farm (2011)
Outer Hebrides Biological Recording group (OHBR)	Data request for records of protected and/or notable species within a 2km radius of the Site
Findlay, M., Alexander, L. & Macleod, C. 2015. Site condition monitoring for otters (<i>Lutra lutra</i>) in 2011-12. Scottish Natural Heritage Commissioned Report No. 521.	Baseline condition status of Lewis Peatlands SAC with respect to otters.

- 1.1.5 Following a search for commercially available records of protected and/or notable species on the National Biodiversity Atlas (NBN) database, biological data requests were sent to the Outer Hebrides Biological Recording Group (OHBR), Comhairle nan Eilan Siar (Western Isles Council), and Scottish Natural Heritage (SNH).
- 1.1.6 OHBR was the only organisation to hold records of biological data for the Development Site and surrounding area. As records are limited to OHBR only, this Desk Study may not provide an exhaustive list of protected species within the local area. OHBR were unable to provide detailed records for certain species, including birds and bryophytes. In addition to this, the area encompassing Development Site and surrounding 2km buffer is largely un-recorded. Therefore, the dataset reflects recorder effort and interests and should not be viewed as a comprehensive reflection of the biodiversity or the ecological or conservation importance of the area.
- 1.1.7 The Western Isles Local Biodiversity Action Plan is currently under revision, as such up to date information regarding species of local conservation concern could not be provided.

1.2 Results

Statutory and Non-statutory Designated Sites

1.2.1 **Table 9A.3** provides details of Statutory and Non-Statutory sites identified within the Study Area defined in **Table 9A.1**. A map detailing the location of each site presented in **Figure 9A-2**.

Table 9A.3 Statutory and Non-statutory Designated Sites within the Study Area

Site name	Designation	Central Grid Reference	Description	Distance and orientation from works site
Statutory Sites				
Lewis Peatlands	SPA and Ramsar	NB326379	The site comprises an extensive area of deep blanket bog, interspersed with bog pool complexes and freshwater lochs. Within Britain, the Lewis peatlands are second in extent only to the Caithness and Sutherland peatlands and represent the extreme north-west part of the range of variation. Features of qualifying interest also include birds of international importance: Red and black throated diver, golden eagle, merlin, golden plover, dunlin and greenshank.	Immediately adjacent to western site boundary.
Lewis Peatlands	SAC	NB320373	Designated for the following qualifying features: acid peat-stained lakes and ponds; blanket bog; clear water lochs with aquatic vegetation and poor to moderate nutrient levels; wet heath; and otters.	Approximately 850m west of site boundary at closest point.
Tong Saltings	SSSI	NB 440358	The site contains one of the largest areas of saltmarsh and tidal flats in the Outer Hebrides and is the best representative intertidal system on the eastern seaboard. Notified natural features include coastal mudflats, saltmarsh and sand dunes. The site is also important for wintering and breeding birds.	Approximately 3km north-east of site boundary.
Achmore Bog	SSSI	NB314275	The site is one of the best examples of blanket bog habitat in Lewis, with a wide range of plants and animals characteristic of western-Scottish blanket bogs. The blanket bog includes hummocks dominated by <i>Racomitrium</i> and <i>Sphagnum</i> moss species. The shallow peat pools have bog sedge <i>Carex limosa</i> and other local species growing in and around them.	Approximately 2.4 km south-west of the Proposed Development
Notes:				
<ul style="list-style-type: none"> Both Loch Orosay and Stornoway Castle Woodlands SSSI have been denoted following submission of the original EIA application in 2011, and therefore no longer need to be considered in this study. 				

Habitats and Vegetation

Phase 1 Habitat and National Vegetation Classification Survey 2011

- 1.2.2 An extended Phase 1 habitat survey and National Vegetation Classification survey (NVC) was carried out by Highland Ecology between September and November 2010⁵. Phase 1 habitat communities within the Development Site Boundary were comprised predominantly of low lying blanket bog and wet heath, with patches of fragmented coniferous woodland to the north-west and south of the site, while acid and marshy grassland was present in areas of ground subject to a degree of agricultural improvement. In terms of waterbodies, the Development Site is intersected by three river catchments, numerous tributary burns, and several freshwater lochs.
- 1.2.3 **Table 9A.4** identifies habitats of nature conservation importance as described in Rafferty & Proctor (2011).

Table 9A.4 Phase 1 Habitats of Nature Conservation Importance within the Proposed Development Site

Site name	Description
Marshy grassland (Purple Moor Grass and Rush Pastures)	Marshy grassland present within the Development Site Boundary was comprised of purple moor grass mire, and marshy vegetation dominated by soft rush with a range of marsh herbs. Marshy grassland dominated by purple moor grass tended to occur on aerated peats with some water movement, and commonly occurs adjacent to channels/ soakaways and alongside acid flush and blanket bog habitats. It was also present in areas drained for planted conifers. Rush pastures tended to be situated in low lying areas and along channels, where it merges with flush habitat. Rush pasture was also present among semi-improved grassland communities to the east of the survey area, close to the landfill site. Marshy grassland habitat is defined in the Scottish Biodiversity List, and as such is considered a priority habitat for biodiversity conservation.
Flushes, soakways and springs: Acid flush	This is a vegetation type (NVC community M6ci/M6d1) which occurs in linear soakways within the blanket bog and alongside more prominent channels and burns. It occurs throughout the survey area although never of great extent. It is rather bland botanically, consisting mainly of rushes over a carpet of Sphagnum moss.
Dry and wet dwarf shrub heath communities	Dry heath was restricted to shallow, well drained peats of less than 0.5m depth. It was not particularly extensive within the Development Site, and tended to occur in small localised patches. Wet heath generally occurred around the base of knolls and steeper banks where blanket bog thins. Dry and wet dwarf shrub heath habitats are listed under Annex 1 of Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive), and as such are considered priority habitats for biodiversity conservation.
Blanket bog communities	The vast majority of land within the Development Site was comprised of blanket bog vegetation on deep peat. The blanket bog habitat was in generally good condition throughout the Development Site, excluding areas drained for the purpose of coniferous forestry plantation and utilised for peat cutting. Blanket bogs are listed within both the Habitats Directive and the Scottish Biodiversity List as habitats of principal importance for biodiversity conservation.
Standing water	Open standing water in the form of pools and lochs is a common feature within the Development Site. From north to south, the main lochs present include: Loch Garbhaig, Loch na Beiste Moire, Loch a' Leadharain, Loch a' Clachan, Loch Speireag, Loch Breag Cnoc a' Chollach, and Loch Briodag. Several smaller lochans are also present within the Development Site Boundary.
Running water	The Development Site is intersected by three river catchments and numerous tributary burns. From north to south, the catchments are as follows: Abhainn Lacasdail (River Laxdale); Abhainn a' Ghlinn Mhoir (Glen River); and the Abhainn Ghrioda (River Creed). The Abhainn Ghrioda is the largest of the three river catchments. Both standing water (ponds) and running water (rivers) are defined in the Scottish Biodiversity List as habitats of principal importance for biodiversity conservation.

⁵ Rafferty & Proctor (2011) Stornoway Wind Farm Phase 1 and NVC Habitat Survey, Highland Ecology.

Ground Water Dependant Terrestrial Ecosystems

- 1.2.4 Groundwater Dependant Terrestrial Ecosystems (GWDTE) are wetlands that depend on groundwater flows or chemistries. GWDTEs receive protection under the Water Framework Directive, and they are sensitive to hydrological and ecological changes caused by development/construction works.
- 1.2.5 Through use of best practice guidance⁶, NVC data collected in 2010/11 was assessed for the potential presence of 'groundwater dependant' habitats within the Development Site and surrounding survey buffer. **Table 9A.5** provides a summary of NVC communities within the Study Area that may indicate the presence of GWDTE. For full details relating to the assessment of GWDTE habitats, please refer to **Chapter 11: Geology, Hydrology and Hydrogeology**.

Table 9A.5 NVC Assessment of Potential GWDTE Habitats Present within the Proposed Development Site and Surrounding Area

GWDTE	Distribution within survey area	Botanical status
M6	Acid flushes are frequent throughout the survey area along linear soakaways, drains and the sides of watercourses. Often occur as small fragmented areas.	Very common throughout Scotland. Usually low diversity and composed of a few very common species. Considered as low botanical value.
M15	Frequent throughout the survey area where peat is less than 50cm deep. Found, along with dry heath, on steeper slopes and knolls, many of which have been identified as potential borrow pits. Also found as small patches within flat blanket bog where the peat thins.	Common throughout Scotland. Listed in Annex 1 of EC Habitats Directive ('4010 Northern Atlantic wet heaths with <i>Erica tetralix</i> ').
M23	Found in small patches alongside channels and soakaways along with M6. Also found in larger stands close to the edge of the blanket bog where the ground is more improved.	Common throughout Scotland on circum-neutral damp ground. Variable in species diversity and botanical value. M23 can be rich but all occurrences in the survey area consist of a few very common species.
M25	Commonly occurs in areas that have been previously drained for planting conifers. Also occurs in small to medium sized stands within blanket bog. Stands out clearly as white/blue on satellite imagery.	Common throughout large parts of Scotland. Dominated by one species and generally regarded as of low botanical value except where it is fed by base-enriched waters or is wet enough to be transitional to swamp. All occurrences in the survey area are very poor in species.
MG10	Occurs in a few locations where previous grazing levels have been high and the landscape has been subject to agricultural improvement.	Commonly occurs in improved farmland throughout Scotland. Composed of very common species. Regarded as low botanical value.

Adapted from Stornoway Wind Farm EIA Chapter 2012.

⁶ SEPA (2017). Land Use Planning System – SEPA Guidance Note 31: Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependant Terrestrial Ecosystems. Version 3.

Protected and Notable Species

- 1.2.6 Biological data records obtained from OHBR indicate the presence of protected species within 2km of the proposed development site. The results are displayed in **Table 9A.6**.

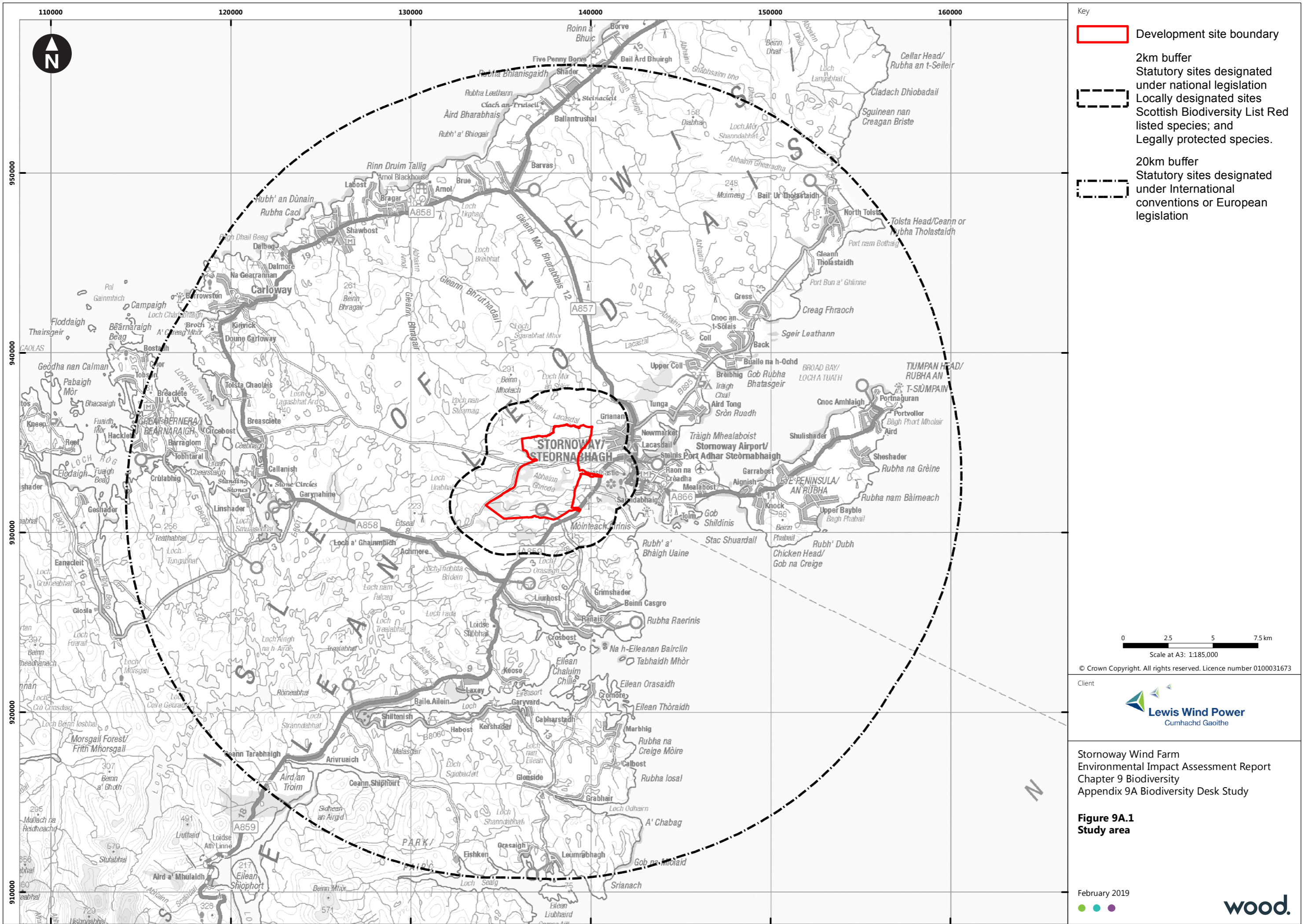
Table 9A.6 Records of Protected Species Presence within 2km of the Development Site Boundary between 2008 and 2018

Species	Scientific name	Number of Records	Year of most recent record	Conservation Designation
Mammal				
European otter	<i>Lutra lutra</i>	2	2013	EPS, SBL
Mountain hare	<i>Lepus timidus</i>	5	2017	WCA, SBL
Reptile				
Slow-worm	<i>Anguis fragilis</i>	3	2018	WCA, SBL
Amphibian				
Common frog	<i>Rana temporaria</i>	6	2011	Local importance
Invertebrate				
Knot-grass moth	<i>Acronicta rumicis</i>	1	2015	SBL
Garden Tiger moth	<i>Arctia caja</i>	2	2016	SBL
Speckled wood butterfly	<i>Pararge aegeria</i>	3	2013	Local importance
Lichen				
Lungwort	<i>Lobaria pulmonaria</i>	3	2018	Local importance
Ramalina fraxinea	<i>Ramalina fraxinea</i>	2	2018	Local importance
<i>Sticta limbata</i>	<i>Sticta limbata</i>	1	2018	Local importance
Notes:				
EPS- European Protected Species, as defined in Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (The Habitats Directive); WCA- Wildlife and Countryside Act 1981 (as amended in Scotland); SBL – Scottish Biodiversity List				

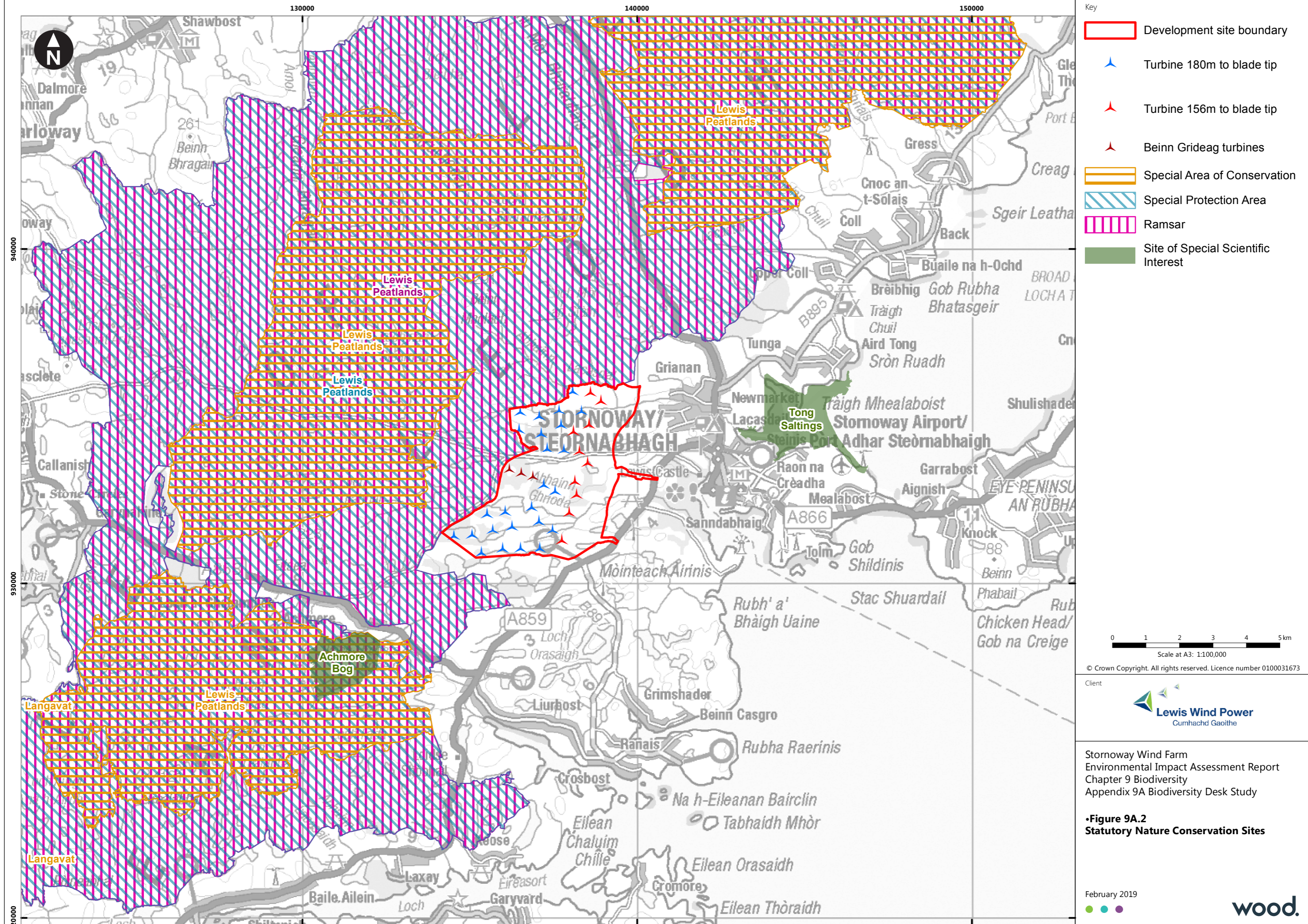
- 1.2.7 Otter surveys were conducted by Waterside Ecology between September and March 2011. A review of this ecological field data revealed that evidence of otter was identified along the surveyed reach of all four river catchments that intersect the Development Site. From north to south, these catchments include Abhainn Lacasdail (River Laxdale), Abhainn a Ghlinn Mhoir (Glen River), Abhainn Ghrioda (River Creed), and Abhainn Leireabhaigh (River Tope). Field signs included spraints, paths, prints, feeding remains and a number of resting sites (holts and couches).
- 1.2.8 Freshwater pearl mussel surveys were carried out by Waterside Ecology between September 2010 and March 2011. Freshwater invertebrate surveys were carried out by Aquaterra Ecology in March 2011. For full details relating to freshwater pearl mussel and freshwater invertebrate survey results, please refer to **Chapter 9: Ecology**.



- 1.2.9 No further protected species surveys (excluding ornithology) were carried out to inform the original EcIA for the Proposed Development.



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- Key
- Development site boundary
 - Turbine 180m to blade tip
 - Turbine 156m to blade tip
 - Beinn Grideag turbines
 - Special Area of Conservation
 - Special Protection Area
 - Ramsar
 - Site of Special Scientific Interest

0 1 2 3 4 5 km
Scale at A3: 1:100,000
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Stornoway Wind Farm
Environmental Impact Assessment Report
Chapter 9 Biodiversity
Appendix 9A Biodiversity Desk Study

•Figure 9A.2
Statutory Nature Conservation Sites