

Stonehaven Bay Coastal Flood Protection Study

Desktop Environmental Baseline Report

Final Report

September 2018

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JBA Project Manager

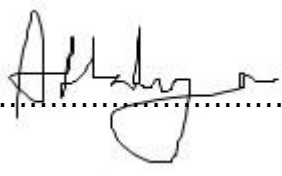
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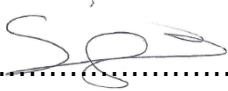
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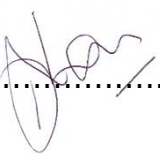
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Contract

This report describes work commissioned by Gavin Penman on behalf of Aberdeenshire Council by a letter dated 27 February 2018 and Purchase Order number 1002287. Dougall Baillie’s representative for the contract was Graeme McCallum. Anissia Halwyn and Sarah King of JBA Consulting carried out this work.

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Purpose

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Acknowledgements

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Abbreviations

CIEEM	Chartered Institute of Ecology and Environmental Management
EPS	European Protected Species
HRA	Habitats Regulations Assessment
INNS	Invasive Non-Native Species
JNCC	Joint Nature Conservation Committee
LNCS	Local Nature Conservation Site
LNR	Local Nature Reserve
MCZ	Marine Conservation Zone
NESBReC	North East Scotland Biological Records Centre
NNR	National Nature Reserve
PEA	Preliminary Ecological Appraisal
PVA	Potentially Vulnerable Area
SAC	Special Area of Conservation
SNH	Scottish Natural Heritage
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
WANE Act	Wildlife and Natural Environment (Scotland) Act
W&CA	Wildlife and Countryside Act

Executive Summary

JBA Consulting was commissioned by Aberdeenshire Council to undertake a desktop ecological assessment of Stonehaven Bay, Aberdeenshire. The results of this study will be used to inform the development of options for Stonehaven Bay Coastal Flood Protection Scheme.

A desk study was undertaken in June 2018 to review existing ecological baseline information available in the public domain and to obtain ecological records held by third parties.

Garron Point SSSI is within the northern area of the site extent in Stonehaven Bay. The proposed coastal flood protection scheme should be designed so as to minimise any effects on the geology, habitats and species for which the SSSI is designated.

Garron Point Special Area of Conservation and Fowlsheugh Special Protection Area are within 2km of the site. The options appraisal will need to consider the ecological impacts to the designated sites at an early stage. Any proposed works will need to be aware of the presence of qualifying bird species from the SPA and if works take place within the northern extent of the site, the presence of Narrow-mouthed Whorl Snail *Vertigo angustior* in Garron Point SAC will need to be considered. The proposed works will need to ensure there are no changes in groundwater run-off or the flooding regime within the SAC to the north.

It is recommended that a Preliminary Ecological Appraisal survey and report is conducted when the scope and extent of works are known. Recommendations for protected species surveys may also be made within the PEA report.

When a final option for the works is known and detailed method statements are available, a Marine Licence will need to be obtained from Marine Scotland. A Habitats Regulations Appraisal and SSSI assent from SNH will be obtained as part of this procedure.

1 Introduction

1.1 Overview

JBA Consulting was commissioned by Aberdeenshire Council to undertake a desktop environmental baseline assessment of Stonehaven Bay, Aberdeenshire. The results of this survey will be used to inform the development of options for Stonehaven Bay Coastal Flood Protection Scheme.

This report identifies the likely ecological and geological constraints associated with the proposed scheme. The report will present the actions required to develop the ecological impact assessment and, in turn the required mitigation and potential opportunities for enhancement.

The approach to this appraisal follows best practice guidance published by the Chartered Institute of Ecology and Environmental Management (CIEEM) including Guidelines for Ecological Report Writing (CIEEM, 2015). The report follows standard biotope methodologies in the Marine Monitoring Handbook (Davies *et al.*, 2001), designed to assess the condition of marine Special Areas of Conservation (SACs) in the UK, which fulfil the UK's common standards for monitoring.

1.2 Site Location and Description

Stonehaven and Cowie are located approximately 20km south of Aberdeen. They sit within Stonehaven Bay on the North Sea, with the Rivers Carron and Cowie flowing through the town and discharging into the bay. The area has been identified as a Potentially Vulnerable Area (PVA) and is at risk of coastal flooding.

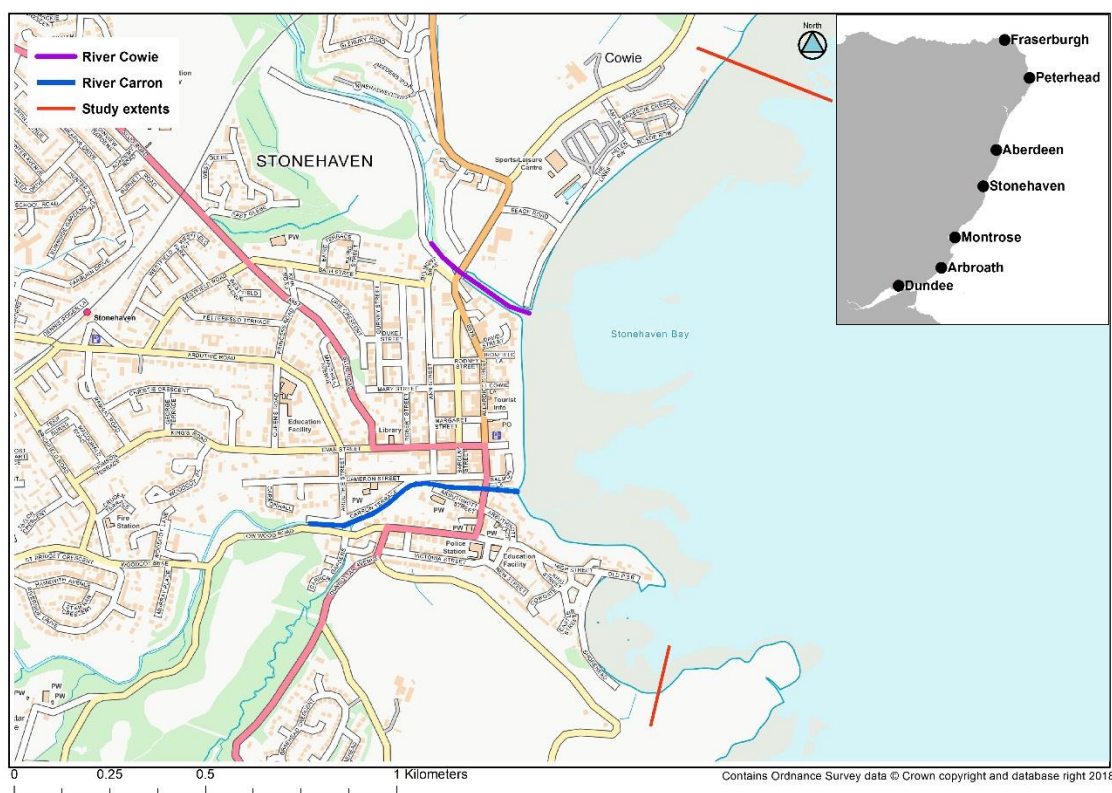


Figure 1-1: Location Plan

1.3 Proposed Works

This report will inform the development of options to provide a coastal flood protection scheme for Stonehaven Bay. Works are expected to take the form of coastal flood defences in Stonehaven Bay.

Details of the proposed works are not currently known; however, they are likely to involve some, or all of the following measures:

- Coastal beach recharge;
- Shingle restoration (coastal sediment recycling);
- Fluvial sediment management and morphological improvements;
- Hard engineering, e.g. raising sea walls; rock armour.

The first three measures are recommended and detailed in the Natural Flood Management and River Basin Management Plan report (JBA Consulting, 2018).

2 Legislation and Planning Policy

The primary legislation in Scotland covering nature conservation and wildlife protection is outlined below. The legislation makes it an offence to kill or capture certain animals including birds, or to remove certain native plants. The law also protects certain animals from disturbance including disturbance of their nests and/ or resting places. This section is not intended as a detailed appraisal of wildlife legislation, or provision of a legal opinion, but aims to provide a summary context to support the desktop ecology report.

2.1 Habitats Directive and Conservation (Natural Habitats, &c.) Regulations 1994

In Scotland, the EU Habitats Directive is transposed through a combination of the Habitats Regulations 2010 (in relation to reserved matters) and the 1994 Regulations. These Regulations afford protection to certain species identified in the Habitats Directive, including those requiring strict protection (European Protected Species (EPS)). Section 2.5 below provides further details on specific species.

The Habitats Regulations 1994 (as amended in Scotland) implement the species protection requirements of the Habitats Directive in Scotland on land and inshore waters (0-12 nautical miles). There are various Schedules attached to the Habitats Regulations including Schedule 2 and 4 which relate to European protected species (fauna and flora, respectively) and Schedule 3 which relates to those animals in Annex V of the Habitats and Species Directive whose natural range includes Great Britain.

The designation and protection of domestic sites, e.g. Sites of Special Scientific Interest (SSSI), and European sites e.g. Special Protection Areas (SPA) and Special Areas of Conservation (SAC) falls within these Regulations.

Public bodies (including the Local Planning Authority) have a duty to have regard to the requirements of the Habitats Directive in carrying out their duties, i.e. when determining a planning application.

The Habitats Regulations Appraisal (HRA) requirements protect European sites by requiring that any plan or project which may have a 'likely significant effect (LSE)' on a site (either individually or in combination with other plans or projects) must be subject to an Appropriate Assessment of its implications for the site in view of the site's conservation objectives. The HRA process is mandatory under the Habitats Directive implemented through The Conservation (Natural Habitats, &c.) Regulations 1994. As part of the process Scottish Natural Heritage (SNH) must be consulted.

The HRA is a multi-stage process through which Appropriate Assessment (AA) is carried out, if in the primary Screening stage of the HRA it is determined that the project may have an adverse impact upon a Natura 2000 site. Such plans or projects may only proceed if they will not adversely affect the integrity of the European site concerned, without the decision of the over-riding public interest. HRA Screening will be required for the site once a preferred option(s) has been selected and the likely scope and extent of works have been planned.

2.2 Wildlife and Countryside Act 1981 (as amended)

The Wildlife and Countryside Act (W&CA) 1981 (as amended) constitutes an important statute relating to the protection of flora, fauna and the countryside within Great Britain. Part 1 of the Act deals with the protection of wildlife. Most

EPS are now covered under the Conservation of Habitats and Species Regulations (as amended; see section 2.1) however certain species and activities are still covered by the W&CA. The W&CA also covered possession of species listed in the various schedules. In Scotland, the W&CA is amended by The Nature Conservation (Scotland) Act 2004 and The Wildlife and Natural Environment (Scotland) Act 2011.

2.3 Nature Conservation (Scotland) Act 2004

The Act serves to make provisions in relation to the conservation of biodiversity; to make further provision in relation to the conservation and enhancement of Scotland's natural features; to amend the law relating to the protection of certain birds, animals and plants; and for connected purposes. Under Section 2(4) of the Act a Scottish Biodiversity List, a list of animals, plants and habitats that Scottish Ministers consider to be of principal importance for biodiversity conservation in Scotland, was compiled.

2.4 Wildlife and Natural Environment (Scotland) Act 2011

The Wildlife and Natural Environment (Scotland) Act (WANE Act) is an Act of the Scottish Parliament to make provision in connection with wildlife and the natural environment; and for connected purposes.

2.5 Protected Species

Certain species and species groups are afforded specific protection under the Conservation (Natural Habitats, &c.) Regulations 1994 and the W&CA 1981 (as amended). Furthermore, under these laws provisions are made for control of spread of non-native invasive species. Relevant species and levels of protection in Scotland are detailed below (Scottish Natural Heritage, 2018).

2.5.1 Badger

Badgers *Meles meles* and their setts are protected by the Protection of Badgers Act 1992. This Act has been supplemented by the WANE Act, making it illegal to kill, injure or take a Badger, or to interfere with an active sett, including blocking an active entrance or allowing a dog to enter the sett. Furthermore, under this legislation, it is illegal to dig for, cruelly ill-treat, or tag a Badger.

2.5.2 Red Squirrel

Red Squirrels *Sciurus vulgaris* are listed on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). It is an offence to intentionally or recklessly:

- kill, injure or take a Red Squirrel;
- damage, destroy or obstruct access to any structure or place which a Red Squirrel uses for shelter or protection (a drey);
- disturb Red Squirrel when it is occupying a structure or place for that purpose; and
- possess or control, sell, offer for sale or possess or transport for the purpose of sale any live or dead Red Squirrel or any derivative of such an animal.

2.5.3 Otter

The European Otter *Lutra lutra* is a EPS protected under the Conservation (Habitats &c) Regulations 1994, making it an offence to:

- deliberately capture, injure or kill an Otter;
- deliberately disturb an Otter such as to affect local populations or breeding success;
- damage or destroy an Otter holt, possess or transport an Otter or any part of an Otter; and
- sell or exchange an Otter.

Otters also receive protection under the Wildlife and Countryside Act 1981 (as amended), this makes it an offence to:

- intentionally or recklessly disturb any Otter whilst within a damage or destroy a breeding site (holt) or resting place of such an animal; and
- intentionally or recklessly obstruct access to a holt or other structure or place otters use for shelter or protection, or otherwise deny the animal use of that place.

2.5.4 Water Vole

The Water Vole *Arvicola amphibious* is protected under the Wildlife and Countryside Act 1981 (as amended). This makes it an offence to:

- intentionally kill, injure or capture a Water Vole;
- possess or control a Water Vole, living or dead, or any part of a Water Vole;
- intentionally or recklessly damage, destroy or obstruct access to any place of shelter, or disturb a Water Vole within such a place; and
- sell or offer for sale a Water Vole living or dead, or part of a Water Vole.

2.5.5 Bats

All UK bat species are EPS under the Conservation (Habitats &c) Regulations 1994. It is an offence to:

- deliberately kill, injure or capture any bat;
- intentionally or recklessly disturb a bat, or deliberately disturb a group of bats;
- damage or destroy, or intentionally or recklessly obstruct access to, a bat roosting place; and
- possess, or sell (living or dead) any bat or part of a bat.

Furthermore, amendments to the Regulations (2007-2012) include, under Regulation 40, that it is no longer a defence to state that killing, capture or disturbance of bats or the destruction of their roosts was an incidental or unavoidable result of a lawful activity.

2.5.6 Breeding Birds

All wild birds (with certain exceptions listed in Schedule 2) are protected under the Wildlife and Countryside Act 1981 (as amended). This makes it an offence to intentionally:

- kill, injure, or take any wild bird;
- take, damage or destroy the nest of any wild bird whilst it is in use or being built; and
- take, destroy or possess the egg of any wild bird.

Furthermore, certain species receive additional protection under Schedule 1, which makes it an offence to disturb these species while they are nest building, or at a nest containing eggs or young, or disturb the dependent young of such birds.

Those species listed on Schedules A1 and 1A receive additional protection which makes it an offence to intentionally or recklessly:

- at any time take, damage, destroy or otherwise interfere with any nest habitually used by any wild bird, when not in use, included in Schedule A1; and
- at any time harass any wild bird included in Schedule 1A.

2.5.7 Reptiles and Amphibians

Legal protection varies considerably for different species. Smooth Snake *Coronella austriaca*, Sand Lizard *Lacerta agilis* and Natterjack Toads *Epidalea calamita* are EPS receiving the same protection as Great Crested Newt. Under the Wildlife and Countryside Act 1981 (as amended) Adder *Viperus berus*, Grass Snake *Natrix natrix*, Common Lizard *Zootoca vivipara* and Slow Worm *Anguis fragilis* are protected from intentional killing or injuring, additionally Common Frogs *Rana temporaria*, Common Toads *Bufo bufo* and other newt species are prohibited from sale.

2.5.8 Wildcat

The Wildcat is a EPS under the Conservation (Habitats &c) Regulations 1994. It is an offence to deliberately or recklessly:

- Capture, injure, kill or harass a wildcat;
- Disturb a wildcat in a den or any other structure or place it uses for shelter or protection;
- Disturb a wildcat while it is rearing or otherwise caring for its young;
- Obstruct access to a den or other structure or place wildcats use for shelter or protection or otherwise deny the animal use of that place;
- Disturb a wildcat in a manner or in circumstances likely to significantly affect the local distribution or abundance of the species;

Disturb a wildcat in a manner or in circumstances likely to impair its ability to survive, breed or reproduce, or rear or otherwise care for its young.

It is also an offence to damage or destroy a breeding site or resting place of such an animal whether or not intentionally or recklessly.

2.5.9 Cetaceans

All species of dolphin, whale and porpoise found in Scottish territorial waters are protected under the Conservation (Natural Habitats, &c.) Regulations 1994. This makes it an offence to intentionally or recklessly:

- Kill, injure or capture a cetacean;
- Disturb or harass a cetacean; and
- Damage or destroy a breeding site or resting place of such an animal (whether or not deliberately or recklessly).

2.5.10 Seal

The main legislation that protects seals in Scottish waters is the Marine (Scotland) Act 2010. Seals are also protected under the Conservation (Natural Habitats, &c) Regulations 1994 and the Protection of Seals (Designation of Haul-Out Sites) (Scotland) Order 2014.

It is an offence to intentionally or recklessly kill, injure or take a seal at any time of year, except:

- To alleviate suffering
- Where Marine Scotland has issued a licence to do so

It is also an offence to intentionally or recklessly harass seals at significant haul-out sites under the Protection of Seals (Designation of Haul-out Sites) (Scotland) Order 2014

2.5.11 Invasive Non-native Species (INNS)

Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) lists 62 plant species, or groups of plants, and 69 animal species. The major amendment to this Act in Scotland is found in the WANE Act (2011). It is an offence to release or cause to spread in the wild any of these species. Of particular note are Japanese Knotweed *Fallopia japonica*, Himalayan Balsam *Impatiens glandulifera*, Giant Hogweed *Heracleum mantegazzanum* and Signal Crayfish *Pacifastacus leniusculus*.

2.6 Planning Policy

2.6.1 Aberdeenshire Local Development Plan 2017

The Aberdeenshire Local Development Plan (Aberdeenshire Council, 2017) contains Policy E1 Natural Heritage, which sets out what development can be permitted in relation to nature conservation sites, protected species and wider biodiversity and geodiversity. The following details of Policy E1 are relevant to the proposed coastal flood protection scheme at Stonehaven:

- New development will not be allowed where it may have an adverse effect on a nature conservation site, except in the case of:
 - an internally designated site where there are imperative reasons of overriding public importance and there is no alternative solution;
 - for nationally designated sites where a thorough assessment has demonstrated that the overall integrity of the site will not be comprised;
 - for local nature conservation sites where the proposal's public benefits clearly outweigh the nature conservation value of the site;
 - In all cases impacts must be suitably mitigated and suitable compensatory measures must be implemented;
- Development should seek to avoid detrimental impact on protected species through the carrying out of surveys and submission of protection plans describing appropriate mitigation where necessary;
- A baseline ecological survey should be prepared for all major development and for smaller proposals where there is evidence that a habitat, geological feature or species of importance may exist on the site; and

- All developments should identify measures that will be taken to improve biodiversity and geodiversity in proportion to the potential opportunities available and the scale of the development.

3 Methodology

3.1 Desk Study

A desk study was undertaken in June 2018 to review existing ecological baseline information available in the public domain and to obtain ecological records held by third parties.

For the purposes of the desk study, the study area was defined to be the site and a 1km radius around it. Information was requested from North East Scotland Biological Records Centre (NESBReC) including records of non-statutory designated nature conservation sites and notable and protected species. Historic records (those preceding 2000) of species whose habitat are considered not to be relevant to the site have been excluded from this report. The full data search results can be provided upon request.

In addition, the MAGIC database (a UK Government website that provides authoritative geographic information about the natural environment) was searched for statutory designated sites within 2km of the site including Marine Conservation Zones (MCZ), Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR), Local Nature Reserves (LNR), European designated Natura 2000 sites (SACs, SPAs) and internationally designated Ramsar sites.

3.2 Data Limitations

Data from biological records centres, or on-line databases, is historical information and datasets might be incomplete, inaccurate or missing. It is important to note that even where data is held, a lack of records for a defined geographical area does not necessarily mean that the species is absent; the area may simply be under-recorded.

4 Desk Study Results

4.1 Statutory Designated Sites

A search of the MAGIC database identified one SSSI within the site boundary and one SAC and one SPA within 2km of the site (see Appendix A) these are detailed below.

4.1.1 Garron Point SAC

Garron Point SAC is approximately 850m to the north east of the site (see Appendix A). The SAC is designated for the population of Narrow-mouthed Whorl Snail *Vertigo angustior* which has very specific habitat requirements, needing marshy, coastal turf, high and even humidity and flowing groundwater, but no deep or prolonged flooding or desiccation (Joint Nature Conservation Committee (JNCC), 2015). At Garron Point it is found in two small areas of damp, free-draining Red Fescue grassland. This is the most northerly population of the species in the UK. This snail species is the only qualifying interest feature for Garron Point SAC. Communication with SNH or a specialist is required to determine the exact distribution of Narrow-mouthed Whorl Snail at Garron Point.

4.1.2 Fowlsheugh SPA

Fowlsheugh SPA is located approximately 1.7km to the south of the site at Stonehaven (see Appendix A). The site is designated as it supports populations of the following species during the breeding season (JNCC, 2001):

- Guillemot *Uria aalge*, 40,140 pairs representing at least 1.8% of the breeding East Atlantic population (Count as at 1992);
- Kittiwake *Rissa tridactyla*, 34,870 pairs representing at least 1.1% of the breeding Eastern Atlantic - Breeding population (Count, as at 1992).

The site also qualifies as containing a seabird assemblage of international importance by regularly supporting 170,000 individual seabirds during the breeding season, including Razorbill *Alca torda*, Herring Gull *Larus argentatus*, Fulmar *Fulmarus glacialis*, Guillemot *Uria aalge* and Kittiwake *Rissa tridactyla*.

Birds from Fowlsheugh SPA are likely to use surrounding habitats, such as littoral sediment present within the site extent (Appendix B) for foraging.

4.1.3 Garron Point SSSI

Garron Point SSSI overlaps with Garron Point SAC and is located to the north of Stonehaven and is within the site extent for this study (see Appendix A). The SSSI is designated for its geology as well as its biological interest. The site supports maritime cliff habitat with large areas of cliff grassland and smaller areas of sand dune, saltmarsh and shingle (SNH, 2005).

Geology

Garron Point SSSI is of national and international importance for a number of geological formations. The coastal outcrop of the Highland Boundary Fault marks the southern geological boundary of the Scottish Highlands. The site demonstrates the structural relationship between the Dalradian, Highland Border Complex and Old Red Sandstone, which are major subdivisions in the geological history of the British Isles. The largest extent of igneous outcrops in the Highland Border Complex lie between Garron Point and Slug Head (approximately 500m to the south of the promontory). The complex is composed of remnants of ocean crust, consisting mainly of metamorphosed tholeiitic pillow lavas with intercalated cherts, siltstones and mudstones. Subordinate gabbroic and doleritic intrusions

also lie within the complex. Associated spatially with these rocks is a carbonated and silicified serpentinite with nodules of serpentinized gabbroic rocks.

South of Slug Head, 'Old Red Sandstone' occurs. This section of the SSSI overlaps with the most northern part of the study extent. These rocks are primarily non-marine Devonian, part of the Cowie Sandstone Formation and the Carron Sandstone Formation. They formed from fluvial deposits, with the exception of the Cowie Harbour Siltstone Member, which formed from lacustrine deposits. At the Toutties, the Cowie Harbour Siltstone Member includes a mudstone containing freshwater fish fossils (Cowie Harbour Fish Bed). This site is unique as being the only one of this age in the Scottish-Baltic fish province.

Biological

The cliff grassland is dominated by species typical of this habitat, such as False Oat-grass *Arrhenatherum elatius*, Red Fescue *Festuca rubra* and Yorkshire Fog *Holcus lanatus*. Other species present include Thrift *Armeria maritima*, Sea Plantain *Plantago maritima*, Sea Campion *Silene uniflora* and Common Scurvygrass *Cochlearia officinalis*. Several species that are uncommon in Aberdeenshire are also present in the cliff grassland, these are Purple Milk-vetch *Astragalus danicus*, Meadow Saxifrage *Saxifraga granulata*, Carline Thistle *Carlina vulgaris* and Bloody Crane's-bill *Geranium sanguineum* (SNH, 2005). The habitats map in Appendix B indicates that most biological interest within the SSSI would be found outside the study extent, on maritime cliffs or grassland.

Garron Point SSSI is also designated as it supports populations of Narrow-mouthed Whorl Snail *Vertigo angustior* and Northern Brown Argus butterfly *Aricia Artaxerxes*, which are rare species of invertebrate.

SNH has produced a list of operations requiring consent within Garron Point SSSI (SNH, 2009). Those operations requiring consent that may be relevant to the proposed coastal flood protection works at Stonehaven are:

- Application of pesticides, including herbicides (weedkillers);
- Dumping, spreading or discharge of any materials;
- The destruction, displacement, removal or cutting of any plant or plant remains, including e.g. shrub, herb, turf;
- Erection of sea defences or coast protection works, including cliff or landslip drainage or stabilisation measures;
- Extraction of minerals including peat, shingle, sand and gravel, topsoil, sub-soil, shells and spoil;
- Construction, removal or destruction of roads, tracks, walls, fences, hardstands, banks, ditches or other earthworks, or the laying, maintenance or removal of pipelines and cables, above or below ground;
- Erection of permanent or temporary structures, or the undertaking of engineering works, including drilling; and
- Modification of natural or man-made features (including cave entrances), clearance of boulders, large stones, loose rock or scree and battering, buttressing, grading or seeding rock faces or outcrops.

4.2 Non-Statutory Designated Sites

The Muchalls to Stonehaven Bay Local Nature Conservation Site (LNCS) lies within the site, covering the area to the seaward side of mean high water (Appendix C). This designation reflects the biological and geological importance of the area at a regional level. The site has a diversity of coastal habitats on the

cliffs and cliff top grasslands, including heathland on some of the headlands dominated bell heather *Erica cinerea*; maritime grassland on the more exposed coastal cliffs with species such as thrift *Armeria maritima* and wood vetch *Vicia sylvatica*; natural grassland dominated by false oat-grass *Arrhenatherum elatius*. Species associated with base-rich soils are present along this stretch, including carline thistle *Carlina vulgaris*. High plant diversity supports high insect diversity, especially insects suited to lime habitats. Along the shore, sand dune, flush and salt marsh habitats are present. Wave-cut platforms around the Garron Point-Skatie Shore coastline support diverse populations of algae. The cliff grasslands in the southern part of the sites are important habitat for the narrow-mouthed whorl snail, as detailed in section 4.1.1.

Downie Point to Todhead Coast LNCS is immediately outside the southern extent of the site. The LNCS is important for breeding seabirds and supports a range of coastal flora with some base rich areas and a good diversity of invertebrates. The site also contains features of geological and geomorphological interest, including a blowhole, hanging valley and unusual platform weathering forms.

4.3 Habitats

North East Scotland Biological Records Centre (NESBReC) habitat data is available for the area for the time periods 2004-2007, 2008-2009, 2010-2012 and 2013-2015. Data for habitats within the site was only recorded between 2004- 2007 (Appendix B). This indicates that the majority of the coastal habitat within the site is comprised of littoral sediment and littoral rock, with a small area of supralittoral sediment. The surrounding area is predominantly comprised of improved grassland and arable land.

4.4 Protected Species

The data search from NESBReC returned many recent and historical records for protected species within 1km of the site. Details of these records including key legislative protection and proximity of the record to the site is given in the following sections. Due to the large amount of data returned, the record closest to the site and the most recent record for each species (post-2000) was given greatest consideration.

4.4.1 Mammals

Protected mammal species returned in the data search are listed in Table 4-1. Wildcat is unlikely to be present on a highly disturbed coastal strip and are therefore not considered any further in this report. Although Badger and Red Squirrel have been observed within 1km of the site, there is unlikely to be habitat suitable for both species within the site extent.

The data search returned records of Water Vole within the River Carron. Water Vole is unlikely to be present on the coastal frontage but could be present within the final reaches of the Rivers Carron which is included in the site extent.

Otter records were also returned in the data search. There could be suitable habitat for Otter present in the River Carron and a previous ecological walkover conducted in 2011 confirms this (JBA Consulting 2011).

The data search returned records of bat species. Bats could be present in the wider area, if suitable habitat is present.

Table 4-1: Records of protected mammal species within 1km of the site (from NESBReC)

Common Name	Scientific Name	UK protection	Distance from Site and Date
Common Pipistrelle	<i>Pipistrellus pipistrellus</i>	Conservation (Habitats &c) Regulations 1994 Schedule 2 Wildlife and Countryside Act 1981 (as amended) Schedule 5	Within the site (2011)
Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	Conservation (Habitats &c) Regulations 1994 Schedule 2 Wildlife and Countryside Act 1981 (as amended) Schedule 5 UKBAP Scottish Biodiversity List	Within the site River Carron (2011)
Hedgehog	<i>Erinaceus europaeus</i>	UKBAP Scottish Biodiversity List	50m N (2015)
Water Vole	<i>Arvicola terrestris</i>	Wildlife and Countryside Act 1981 (as amended) Schedule 5 UKBAP Scottish Biodiversity List	80m W and within River Carron (2014)
Otter	<i>Lutra lutra</i>	Conservation (Habitats &c) Regulations 1994 Schedule 2 Wildlife and Countryside Act 1981 (as amended) Schedule 5 UKBAP Scottish Biodiversity List	350m S (2013)
Red Squirrel	<i>Sciurus vulgaris</i>	Wildlife and Countryside Act 1981 (as amended) Schedule 5 UKBAP Scottish Biodiversity List	500m W (2012)
Badger	<i>Meles meles</i>	Protection of Badgers Act 1992 (as amended)	600m N (2015)
*Key: UKBAP= Priority Species in the UK Biodiversity Action Plan; WCA= Wildlife and Countryside Act with schedule number; BoCC= Birds of Conservation Concern Red or Amber listed			

4.4.2 Breeding and wintering birds

A number of bird species were returned in the data search, with protected species records presented in Table 4-2. The majority of these records were of songbirds and waders. It is likely that waders forage on the littoral sediment shown in the habitat maps in the appendices, although due to the disturbed nature of the habitats around the site, there may be low potential for ground-nesting birds to nest within the site.

Table 4-2: Records of protected bird species within 1km of the site (from NESBReC)

Common Name	Scientific Name	UK protection	Distance from Site and Date
Peregrine	<i>Falco peregrinus</i>	WCA 1 UKBAP Scottish Biodiversity List	Within the site (2015)
Swift	<i>Apus apus</i>	BoCC Amber Scottish Biodiversity List	Within the site (2015)
Redshank	<i>Tringa totanus</i>	BoCC Amber	Within the site (2014)
House Sparrow	<i>Passer domesticus</i>	BoCC Red UKBAP Scottish Biodiversity List	Within the site (2012)
Dunlin	<i>Calidris alpina</i>	BoCC Amber Scottish Biodiversity List	Within the site (2005)
Red-throated Diver	<i>Gavia stellata</i>	BoCC Amber Scottish Biodiversity List	Adjacent to south of site (2008)
Yellowhammer	<i>Emberiza citrinella</i>	BoCC Red UKBAP Scottish Biodiversity List	300m S (2016)
Tree Sparrow	<i>Passer montanus</i>	BoCC Red UKBAP Scottish Biodiversity List	300m S (2016)
Ring Ouzel	<i>Turdus torquatus</i>	BoCC Red UKBAP Scottish Biodiversity List	300m S (2016)
Eider	<i>Somateria mollissima</i>	BoCC Amber	650m S (2011)
Curlew	<i>Numenius arquata</i>	BoCC Red UKBAP Scottish Biodiversity List	700m NE (2013)
Skylark	<i>Alauda arvensis</i>	BoCC Red Scottish Biodiversity List	750m NE (2008)
Snow Bunting	<i>Plectrophenax nivalis</i>	WCA 1 Scottish Biodiversity List	800m S (2010)
*Key: UKBAP= Priority Species in the UK Biodiversity Action Plan; WCA= Wildlife and Countryside Act with schedule number; BoCC= Birds of Conservation Concern Red or Amber listed			

4.4.3 Amphibians and reptiles

No records of amphibians and reptiles were returned in the data search. Amphibians and reptiles are considered extremely unlikely to be present on a coastal strip and are therefore not considered any further in this report

4.4.4 Marine mammals

Records of Bottle-nosed Dolphin and Minke Whale were returned in the desk study and are likely to be found in the sea close to the study extent (Table 4-3).

Table 4-3: Records of protected marine mammal species within 1km of the site (from NESBReC)

Common Name	Scientific Name	UK protection	Distance from Site and Date
Bottle-nosed Dolphin	<i>Tursiops truncatus</i>	Conservation (Natural Habitats, &c.) Regulations 1994 Wildlife and Countryside Act 1981 (as amended) UKBAP Scottish Biodiversity List	650m SE (2012)
Minke Whale	<i>Balaenoptera acutorostrata</i>	Conservation (Habitats &c) Regulations 1994 UKBAP Scottish Biodiversity List	550m E (2011)
*Key: UKBAP= Priority Species in the UK Biodiversity Action Plan; WCA= Wildlife and Countryside Act with schedule number; BoCC= Birds of Conservation Concern Red or Amber listed			

4.4.5 Invertebrates

Records of Grayling *Hipparchia semele* and Northern Brown Argus *Aricia artaxerxes* were returned in the desk study (Table 4-3). Northern Brown Argus can be found on alkaline ground in coastal valleys, where its larval foodplant, Common Rock-rose *Helianthemum nummularium* grows. Grayling is found in dry, infertile habitats, occurring on poor, dry grasslands, dry heaths and in dunes on the coast. According to the habitat map in Appendix B, suitable habitat for these species is likely to be present in the wider area, but not within the study extent

Table 4-4: Records of protected invertebrate species within 1km of the site (from NESBReC)

Common Name	Scientific Name	UK protection	Distance from Site and Date
Grayling	<i>Hipparchia semele</i>	UKBAP Scottish Biodiversity List	Within the site (2003)
Northern Brown Argus	<i>Aricia artaxerxes</i>	UKBAP Scottish Biodiversity List	Adjacent to north of site (2016)
*Key: UKBAP= Priority Species in the UK Biodiversity Action Plan; WCA= Wildlife and Countryside Act with schedule number; BoCC= Birds of Conservation Concern Red or Amber listed			

4.4.6 Fish

A number of fish species in the River Carron were returned in the data search (Table 4-5: Records of protected fish species within 1km of the site (from NESBReC) The River Carron and its tributaries are known to be prized Trout and Salmon nurseries.

Table 4-5: Records of protected fish species within 1km of the site (from NESBReC)

Common Name	Scientific Name	Distance from Site and Date
Atlantic Salmon	<i>Salmo salar</i>	Within the site in River Carron (2010)
Brown/Sea Trout	<i>Salmo trutta</i>	Within the site in River Carron (2010)
European Eel	<i>Anguilla anguilla</i>	In River Carron (2010)
*Key: UKBAP= Priority Species in the UK Biodiversity Action Plan; WCA= Wildlife and Countryside Act with schedule number; BoCC= Birds of Conservation Concern Red or Amber listed		

4.5 Invasive Non-Native Species

Numerous records of INNS were returned in the data search these are summarised in Table 4-6 below.

Table 4-6: Records of INNS within 2km of the site

Common Name	Scientific Name	Distance from Site and Date
Purple Laver seaweed	<i>Porphyra umbilicalis</i>	Within the site (2008)
Himalayan Balsam	<i>Impatiens glandulifera</i>	On banks of River Cowie and Carron (2017)
Japanese Knotweed	<i>Fallopia japonica</i>	Adjacent to west of site (2014)
Giant Hogweed	<i>Heracleum mantegazzianum</i>	Adjacent to west of site (2017)

5 Conclusions and Recommendations

5.1 Statutory Designated Sites

When a final option for the works is known and detailed method statements are available, a **Marine Licence** will need to be obtained from Marine Scotland. A **Habitats Regulations Appraisal** and **SSSI consent** from SNH will be obtained as part of this procedure. However, the proposed coastal flood protection scheme should be designed to minimise any effects on the habitats and species for which the statutory sites are designated. Therefore, a **Preliminary Ecological Appraisal (PEA) should be commissioned as soon as possible, when the scope and extent of the preferred option is known** to establish which, if any, of the designated habitats and species could be affected by the works.

A HRA screening will need to be conducted to establish whether the works have the potential to have a likely significant effect on either Garron Point SAC or Fowlsheugh SPA.

Any proposed works within the northern extent of the site will need to be especially aware of the presence of Narrow-mouthed Whorl Snail in Garron Point SAC. The proposed works will need to ensure there are no changes in groundwater run-off or the flooding regime within the SAC to the north. If the preferred option includes works in the northern section of the study extent, communication with SNH or a specialist is required to determine the exact distribution of Narrow-mouthed Whorl Snail at Garron Point. This information will support the HRA screening assessment.

Birds from Fowlsheugh SPA are likely to use surrounding habitats for foraging. The potential impact on breeding birds must be considered so that a preferred option can be developed to minimise any effects on breeding birds. A site visit will record areas of habitat with the potential to support breeding birds. Such an assessment focuses principally on the vegetative habitats present, but also any aquatic, man-made, or other features that could support nesting birds, and will determine the need for further bird surveys. This information will support the HRA screening, which will assess the potential impacts on designated features of the SPA. Fowlsheugh is also an RSPB reserve. Therefore, discussions with the RSPB will be required once further details on the extent and nature of works are available.

Garron Point SSSI is within the northern area of the site extent in Stonehaven Bay. The proposed coastal flood protection scheme should be designed to minimise any effects on the habitats and species for which the SSSI is designated. The habitats map in Appendix B indicates that most biological interest within the SSSI would be found outside the study extent, on maritime cliffs or grassland. However, Garron Point SSSI is of national and international importance for a number of geological formations which are present within the study site. Of particular note are the Old Red Sandstone formations within the northern part of the FPS site extent, including the Cowie Harbour Siltstone Member containing freshwater fish fossils. The construction and operation of Stonehaven FPS will need to be designed to avoid any impacts on this unique geological formation within the site extent, but also to avoid impacts on the wider coast as a result of modified coastal processes.

5.2 Non-Statutory Designated Sites

The Muchalls to Stonehaven Bay Local Nature Conservation Site (LNCS) lies within the site, covering the area to the seaward side of mean high water and

Downie Point to Todhead Coast LNCS is immediately outside the southern extent of the site. The sites are important for a range of ecological, geological and geomorphological features, similar to the statutory designated sites described in section 5.1. The proposed coastal flood protection scheme should be designed to minimise any effects on the features for which the non-statutory sites are designated. Therefore, a Preliminary Ecological Appraisal (PEA) should be commissioned following confirmation of the preferred option, to establish which, if any, of the non-statutory designated sites could be affected by the works.

5.3 Habitats

The desk study identified that the habitats present within the site between 2004 and 2007 were littoral sediment and rock, with a small area of supralittoral sediment. As this information is over 10 years old the habitats on site may have changed. Once the preferred option for the coastal flood protection scheme are known, a detailed PEA survey is recommended of the areas to be affected by the proposed works. This will include a Phase 1 Habitat Survey (including Marine Habitat Classification) to broadly categorise the habitat types present on the site. This will allow a more detailed assessment of the potential ecological constraints and opportunities to inform the detailed design.

5.4 Protected Species

The desk study identified numerous records of common bird species both within the site and in the wider area. There are no records of the seabird species for which Fowlsheugh SPA is designated. However, the lack of records does not indicate that these species are absent from the area. During an ecological walkover following confirmation of the scope and extent of the works, habitats will be assessed for their potential to support protected bird species and any incidental bird sightings during the survey will be recorded. Recommendations for further bird surveys will be made if necessary.

There are known populations of Common and Soprano Pipistrelle bats within the site. During an ecological walkover following confirmation of the scope and extent of works, trees and structures within the site will need to be inspected for their bat roost potential in line with good practice guidelines (Collins, 2016).

The River Carron had a population of Water Voles in 2014, and there were numerous reported sightings of Otter in the area in 2013. A PEA will be required following confirmation of the scope and extent of the works, where habitats will be assessed for their potential to support Otter and any field signs discovered during the survey will be recorded. The PEA survey will identify any potential Water Vole burrows or Otter holts or resting places within the proposed works area. Recommendations for further surveys for Water Vole and Otter will be made if necessary.

The River Carron also supports populations of Atlantic Salmon, Sea/ Brown Trout and European Eels. Consideration should be given to these species if any in-channel working is proposed in the River Carron, and the proposed works should be designed to maintain fish passage for these migratory species.

Marine mammals such as Minke Whale and Bottle-nosed Dolphin are present close to the site extent. These species are sensitive to underwater noise from development activity, such as piling and blasting. When the scope and nature of the works have been confirmed, communication with SNH will be required to assess the need for targeted species surveys and mitigation measures.

5.5 Invasive Non-Native Species

Records of four INNS in close proximity to the site were returned in the data search. The PEA survey will identify whether any of these species are within the area to be affected by the proposed works. Further recommendations will then be made to minimise the risk of spreading these species during works.

5.6 Summary of Recommendations

Recommendations for surveys and assessments are summarised in Table 5-1 below, along with a suggested programme. Further recommendations for any additional protected species surveys will be made in the PEA report, if necessary.

Table 5-1: Summary of Recommendations

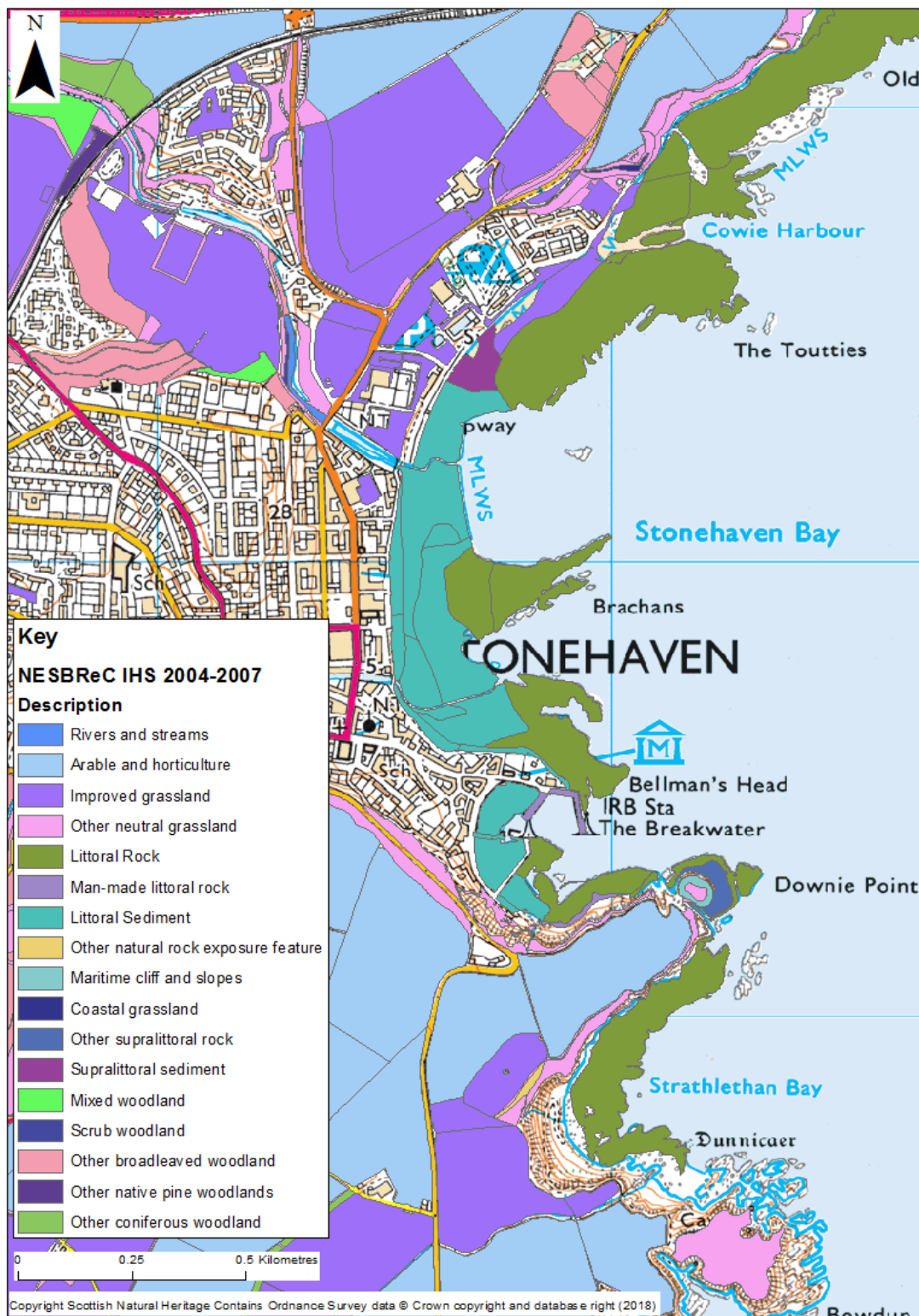
Recommendation	Suggested Timings
PEA survey and report	When scope and extent of preferred option is known
Marine Licence	When final option is known
HRA Screening Assessment	When final option is known, as part of Marine Licence procedure. Likely to assess impact on SPA, possibly SAC if works are planned to the north of study extent.
SSSI consent	When final option is known, as part of Marine Licence procedure

Appendices

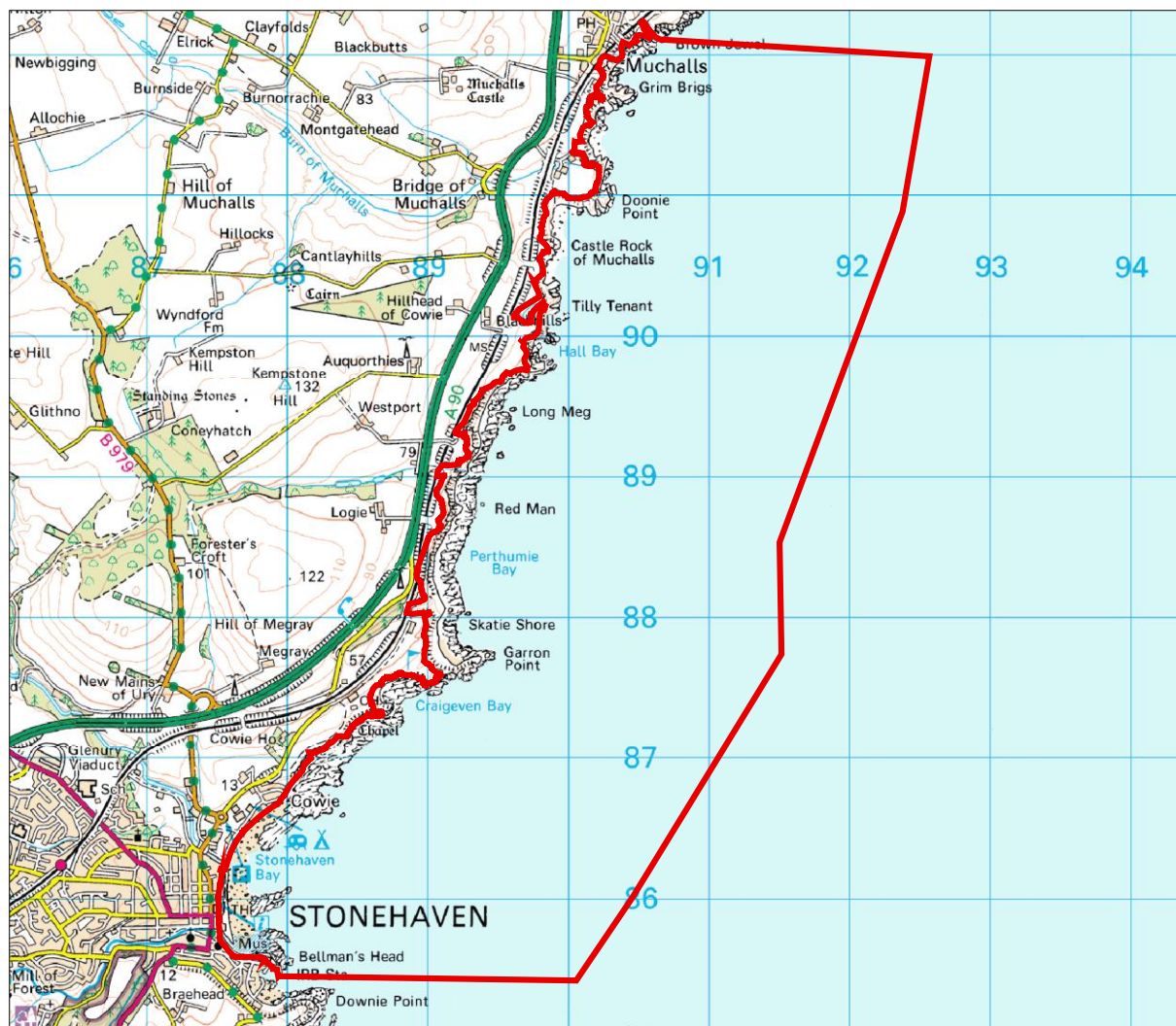
A Designated Sites within 2km of Stonehaven Bay



B NESBReC habitats survey 2004-2007



C Muchalls to Stonehaven Bay LNCS Boundary



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