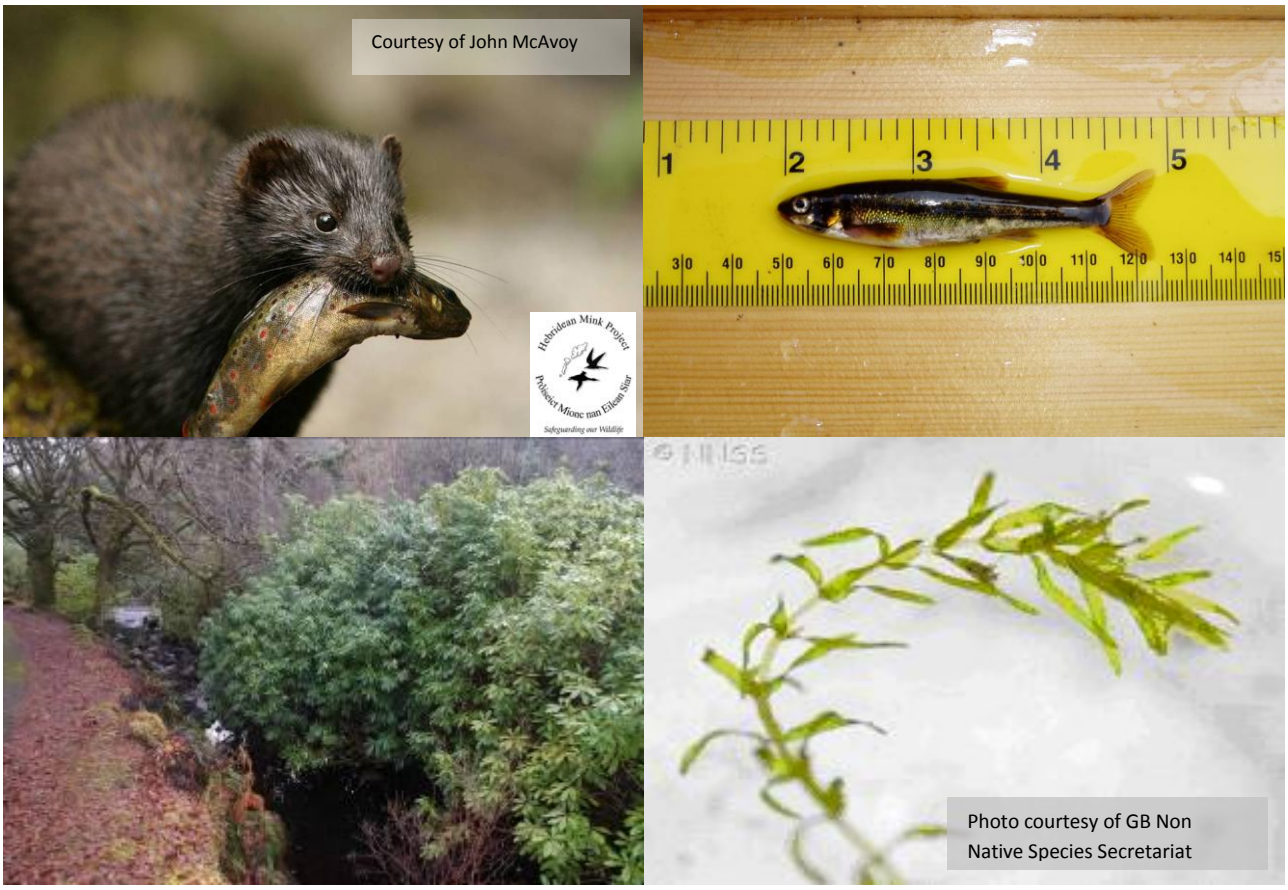
Outer Hebrides Biosecurity Plan

2010 – 2015

Final Version 1



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What is Biosecurity?

Scotland's Environmental and Rural Services in their Biosecurity Guidance state that "Good biosecurity practice refers to a way of working that minimises the risk of contamination and the spread of animals and plan pests and diseases, parasites and non-native species".

What are Invasive Non-Native Species?

Invasive non-native species are those that have been transported outside of their natural range and that damage our environment, the economy, our health and the way we live.

Abbreviations

Abbreviation	Organisation
ASSG	Association of Scottish Shellfish Growers
BTA	British Trout Association
CnES	Comhairle nan Eilean Siar
DSFBs	District Salmon Fisheries Boards
FCS	Forestry Commission Scotland
MS	Marine Scotland
NNSS	Non Native Species Secretariat
OHFT	Outer Hebrides Fisheries Trust
RAFTS	Rivers and Fisheries Trusts of Scotland
RSPB	Royal Society for the Protection of Birds
SEPA	Scottish Environment Protection Agency
SFCC	Scottish Fisheries Co-ordination Centre
SG	Scottish Government
SNH	Scottish Natural Heritage
SSPO	Scottish Salmon Producers' Organisation
TWG	Tripartite Working Group
WIDSFB	Western Isles District Salmon Fisheries Board

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Executive Summary

The Outer Hebrides Biosecurity Plan is one of a set of 20 biosecurity plans being produced throughout Scotland as part of a national programme of action implemented through the Rivers and Fisheries Trusts of Scotland with backing and support from the Scottish Government, Scottish Natural Heritage, Scottish Environment Protection Agency, and the Esmeé Fairbairn Foundation. The plan describes the biosecurity issues of the Outer Hebrides region and presents actions that have been agreed with stakeholders for the prevention, early detection, control and mitigation of the introduction and spread of selected invasive non native species (INNS) and fish diseases.

The vision of this plan is:

'To establish a sustainable framework that will lead to the prevention, detection, control and eradication of selected invasive non-native species within the Outer Hebrides region'.

This vision will be achieved through the realisation of three objectives with five outputs:

Objective 1: Reduce the risk of introduction and spread of identified INNS, within the Outer Hebrides Region.

> ***Output 1.1:*** *Key stakeholders aware of the impacts and measures required to prevent their introduction and spread*

Objective 2: Establish optimum surveillance, detection, monitoring and rapid response systems for identified INNS

> ***Output 2.1*** *Early warning systems for surveillance, detection and monitoring of new and existing INNS in the region established*
> ***Output 2.2*** *Rapid response mechanism (RRM) established and functioning*
> ***Output 2.3*** *Develop strategic monitoring of selected INNS within region*

Objective 3: Develop effective and sustainable control and eradication programmes for existing INNS that pose significant threats to local riparian and aquatic biodiversity and the islands' economy

> ***Output 3.1*** *Effective sustainable control/eradication programmes within the Outer Hebrides region are established and fully functional*
> ***Output 3.2*** *Outputs and proposed activities associated with the plan are reported to and discussed with the West Highland Area Advisory Group (WHAAG) and the Local Biodiversity Action Plan (LBAP) Steering Group*

The implementation of this biosecurity plan will bring many socio-economic and environmental benefits:

- The maintenance and enhancement of biodiversity – biotic invasion is one of the top five drivers for global biodiversity loss and is increasing with globalisation and tourism
- The visual conservation of local landscapes
- The prevention of the salmon parasite *Gyrodactylus salaris* from entering the Outer Hebrides region which would avoid catastrophic economic and environmental loss.
- A holistic, cost effective control programme of INN plants e.g. Giant hogweed, Japanese knotweed, and Himalayan balsam the former being a threat to human health will be founded in partnership with key stakeholders.
- The conservation of important natural habitats for native species such as Otter, Atlantic salmon, freshwater pearl mussel, European eel,
- Reduced risk of the introduction of the signal crayfish.

- Control/eradication of the American Mink
- Reduced risk of introduction of species such as Zebra mussel from entering the regions watercourses will help to protect vital local businesses from expensive mitigation measures required if this species was to occur and establish.
- Helping to ensure the outcome of INNS management in the Outer Hebrides region is more cost effective, strategic and sustainable.

The actions required to realise the above objectives and outputs along with the lead agency, key partners and timeframe required for their implementation are presented in the table below.

ACTION	LEAD	PARTNERS	TIMEFRAME						
			2009	2010	2011	2012	2013	2014	2015
Objective 1: Reduce the risk introduction and spread of identified INNS, within the Outer Hebrides Region.									
Output 1.1: Key stakeholders aware of the impacts and measures required to prevent their introduction and spread									
Launch of OHFT Biosecurity plan through national and local – create press release	OHFT	RAFTS, SG, NNSS, SEPA, SNH		—					
Produce leaflet on legislation including waste management & planning regulations	CnES	SNH, AAG		——					
Produce leaflet(s) on biosecurity issues and the reporting system	OHFT	SNH, AAG		—					
Produce poster(s) on biosecurity issues and distribute to the general public	OHFT	RAFTS, SNH, AAG, Plantlife		·····	·····	·····	·····	·····	·····
Promote and install disinfection facilities for anglers at all angling proprietors fishing huts/parking points	WISFB	OHFT		·····	·····	·····	·····	·····	·····
Develop interim Code of Practice with Local Port Authorities	Port Authorities, CnES	OHFT, SEPA		—	——				
Distribute Codes and posters to relevant retail outlets and clubs at open days and events such as agricultural shows	Highland Invasive Species Forum	CnES, SNH, SEPA		·····	·····	·····	·····	·····	·····
Engage with Landowners and angling clubs to promote awareness measures to tenants, resource –users, members and visitors	OHFT	SNH, SEPA		—	——				
Work with environmental groups and local schools to enhance awareness of INNS	OHFT	SNH , CnES		·····	·····	·····	·····	·····	·····
Objective 2: Establish optimum surveillance, detection, monitoring and rapid response systems for identified INNS									
Output 2.1 Early warning systems for surveillance, detection and monitoring of new and existing INNS in the region established									
Train OHFT personnel in the identification of INNS	SNH, RAFTS	OHFT		——	——				
Train OHFT as trainers	SNH, RAFTS	OHFT			——				
Work with user and interest groups to identify “eyes”	OHFT	All			——				
Training of “eyes”	OHFT	SNH, SEPA			——	——	- - -	- - -	- - -

ACTION	LEAD	PARTNERS	TIMEFRAME						
			2009	2010	2011	2012	2013	2014	2015
Produce database to record and manage INNS sightings	OHFT	RAFTS							
Establish, test and refine communication mechanisms within 'early warning' system	OHFT	RAFTS , SEPA (National)							
Monitor and periodically evaluate efficacy of surveillance system	OHFT	RAFTS							
Output 2.2 Rapid Response Mechanism (RRM) established and functioning									
Formulate contingency plans for specific species	OHFT	CnES, SEPA and SNH							
Identification of personnel for response teams	OHFT	CnES, SEPA and SNH							
Training of personnel to execute contingency plans	OHFT	CnES, SEPA and SNH							
Identification of funding resources	OHFT, RAFTS	CnES, AAG, HISF and SNH							
Refresher training	OHFT	SNH, RAFTS							
Establish local communications systems	OHFT	CnES, SEPA and SNH							
Monitor population(s)	OHFT	SNH, SEPA							
Output 2.3 Develop strategic monitoring of INNS within region									
Develop and agree protocols	SFCC	SEPA/SNH							
Produce database to manage INNS survey data	SFCC	SEPA SNH							
Training of Trust and other agency staff in monitoring methods	OHFT SEPA Highland Council	SFCC/RAFTS SEPA Highland Council							
Develop monitoring manual	SFCC	RAFTS, SEPA (National)							
Objective 3: Develop effective control and eradication programmes for existing INNS that pose significant threats to local riparian and aquatic biodiversity and the islands' economy									
Output 3.1 Effective sustainable control/eradication programmes within the Outer Hebrides region are established and fully functional									
Initiate and complete catchment wide surveys by trained personnel	OHFT								
Establish GIS database for recording and mapping INNS within Outer Hebrides region	OHFT	RAFTS, SFCC, SEPA							
Continuation of mink eradication programme	SNH	CnES, OHFT, HIE, RSPB							

ACTION	LEAD	PARTNERS	TIMEFRAME						
			2009	2010	2011	2012	2013	2014	2015
Implementation of phase 1 of control/ eradication programme	OHFT	Angling clubs, Landowners, SNH, SEPA[1]							
Implementation of habitat restoration scheme within successful control areas taking into account all relevant species	OHFT	Angling clubs, Landowners, SNH, SEPA[2]							
Monitor the effectiveness of control programmes	OHFT	SEPA							
Marine Scotland monitoring Red Vent Syndrome	MS								
Output 3.2 Outputs and proposed activities associated with the plan are reported to and discussed with the West Highland Area Advisory Group (WHAAG) and the Local Biodiversity Action Plan (LBAP) Steering Group									
Complete draft biosecurity plan	OHFT								
Consult with all stakeholders to agree biosecurity plan	OHFT	All							
Report to WHAAG and LBAP	OHFT	WHAAG & LBAP members							
Identify and develop opportunities for future funding of eradication projects	OHFT	Highland Invasive Species Forum SEPA AAG FC SNH							

[1] May be eligible for funding from the Restoration Fund
[2] May be eligible for funding from the Restoration Fund

1. Purpose and Scope

The plan describes the biosecurity issues of the Outer Hebrides region and presents actions that have been agreed with stakeholders for the prevention, early detection, control and mitigation of the introduction and spread of selected invasive non native species (INNS) and fish diseases.

The vision of this plan is:

'To establish a sustainable framework that will lead to the prevention, detection, control and eradication of selected invasive non-native species within the Outer Hebrides region'.

This will achieved through the application of appropriate management activities, data collection, liaison, education and legislation and the realisation of three objectives with five outputs:

Objective 1: Reduce the risk of introduction and spread of identified INNS, within the Outer Hebrides Region.

Objective 2: Establish optimum surveillance, detection, monitoring and rapid response systems for identified INNS.

Objective 3: Develop effective control and eradication programmes for existing INNS that pose significant threats to local riparian and aquatic biodiversity and the islands' economy.

These objectives are in accordance with established protocols for fish diseases and with three key elements of the Invasive Non Native Species Framework Strategy for Great Britain[3]:

- Prevention,
- Early detection, surveillance, monitoring and rapid response,
- Mitigation, control and eradication

The objectives of this plan will be achieved through a partnership approach to implement the agreed actions.

The ultimate key to the effectiveness of this plan is the building of local awareness, capacity and partnerships to ensure the success and long term sustainability of the presented actions.

The implementation of this biosecurity plan will bring many socio-economic and environmental benefits:

- The maintenance and enhancement of biodiversity – biotic invasion is one of the top five drivers for global biodiversity loss and is increasing with globalisation and tourism
- The visual conservation of local landscapes
- The prevention of the Salmon parasite *Gyrodactylus salaris* from entering the Outer Hebrides region which would avoid catastrophic economic and environmental loss.

[3] www.nonnativespecies.org

- A holistic, cost effective control programme of INN plants e.g. Giant hogweed, Japanese knotweed, and Himalayan balsam the former being a threat to human health will be founded in partnership with key stakeholders.
- The conservation of important natural habitats for native species such as Otter, Atlantic salmon, freshwater pearl mussel, European eel,
- Reduce risk of the introduction of the signal crayfish.
- Control/eradication of the American Mink
- Reduce risk of introduction of species such as Zebra mussel from entering the region watercourse will help to protect vital local businesses from expensive mitigation measures required if this species was to occur and establish.

2. Background

2.1. The Outer Hebrides Fisheries Trust

The Outer Hebrides Fisheries Trust (OHFT), formerly the Western Isles Fisheries Trust (WIFT), was formed in 1996. The Trust is a charitable, community based organisation conducting scientific research into wild fish stocks and advising on fisheries management. Trustees include fishery owners and managers, the aquaculture industry, angling clubs, community groups and statutory bodies. Amongst its responsibilities the Trust also acts as a focal point for angling tourism (through the Angling Promotion Officer) and liaison with the aquaculture industry (Tripartite Working Group Regional Development Officer).

2.2. The Outer Hebrides Fisheries

The Outer Hebrides are a chain of islands off the north-west coast of Scotland that extend some 130miles from the Butt of Lewis in the North to Barra in the South (fig.1). The wild fish populations of the Outer Hebrides include Atlantic salmon *(Salmo salar)*, Sea trout *(Salmo trutta* (anadromous)), Brown trout *(Salmo trutta* (freshwater*))*, Arctic charr *(Salvelinus alpinus)*, lamprey *(lampetra planeri)*, sticklebacks *(Gasterosteus aculeatus aculeatus and Pungitius pungitius)* and European eels *(Anguilla anguilla)*. The combined wild fisheries provide some 260 full time equivalent jobs and angling tourism is worth £6 million to the local economy[4].

2.3 Biosecurity Planning

This plan describes the biosecurity issues of the Outer Hebrides region and presents actions that have been agreed with stakeholders for the prevention, early detection, control and mitigation of the introduction and spread of selected INNS and fish diseases. The geographic coverage of the Outer Hebrides region and biosecurity plan is shown in Figure 1.

The survival of Salmon and Sea trout in their marine phase has declined dramatically in recent years. It is vital that the aquatic and riparian habitats associated with these valuable species are protected from the introduction and detrimental effects associated with the introduction of INNS.

[4] http://www.tripartiteworkinggroup.com/content.asp?ArticleCode=61

Although prepared by the Outer Hebrides Fisheries Trust, this plan is one of a set of 20 biosecurity plans being produced throughout Scotland as part of a national programme of action implemented through the Rivers and Fisheries Trusts of Scotland[5] (RAFTS) with backing and support from the Scottish Government[6], Scottish Natural Heritage[7] (SNH), Scottish Environment Protection Agency[8] (SEPA) and the Esmeé Fairbairn Foundation[9].

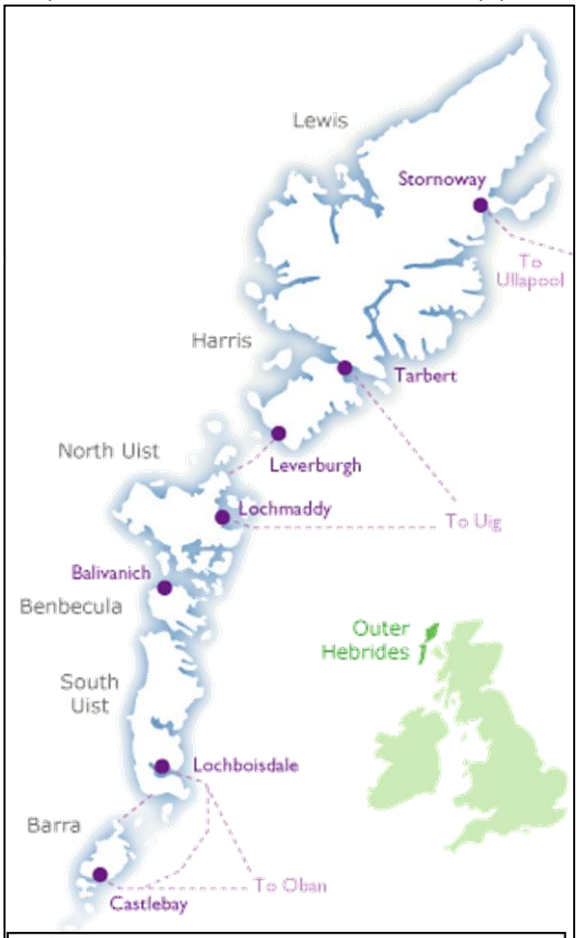

Figure 1 – The Outer Hebrides region.
Picture courtesy of www.fishpal.com.

The need for action on biosecurity issues has been identified in the Outer Hebrides Fisheries Trust Fisheries Management Plan[10] and in the West Highland River Basin Area Management Plan[11]. This biosecurity plan is a platform for local action to address those biosecurity issues. This plan has a lifespan of six years and as part of an adaptive management cycle its outcomes and impacts will be reviewed and incorporated in the next generation plan. Although this plan is not a legal instrument in itself it utilises existing legal and regulatory instruments to support the implementation of its actions and in pursuance of the realisation of its objectives.

The plan was produced using a participatory planning process coordinated by the Outer Hebrides Fisheries Trust through which stakeholders identified and agreed the aims, outputs and actions presented in this plan. The plan builds partnerships of differing groups of stakeholders to implement the actions required to address the complex issues associated with biosecurity. This plan therefore represents the agreed approach of the Outer Hebrides Fisheries Trust, stakeholders and appropriate regulatory agencies in the Outer Hebrides region for the prevention, early detection and control of non native invasive species, fish diseases and parasites. As the spread of INNS is not isolated to the Outer Hebrides this plan will also facilitate coordination and communication with the neighbouring fisheries Trusts, Boards, local authorities and other stakeholders of neighbouring areas e.g. Skye, Wester Ross, West Sutherland, Lochaber and Argyll.

[5] http://www.rafts.org.uk/home/home.asp
[6] http://www.scotland.org.uk/home
[7] http://www.snh.org.uk/
[8] http://www.sepa.org.uk/default.aspx
[9] http://www.esmeefairbairn.org.uk/
[10] http://www.rafts.org.uk/projects/fisheriesmanagementplanning.asp
[11] http://www.sepa.org.uk/water/river_basin_planning.aspx

3. The Context

3.1 Biosecurity: The Nature of the Problem

Biosecurity issues are of increasing economic and ecological significance. Globalisation has expanded the possibilities, extent and complexity of world trade and the growth of the tourism market has expanded the number of destinations for activity holidays and travellers. These trends have led to the increased probability of the unintentional as we all as intentional introduction, establishment and spread of non native invasive species, parasites and diseases in Scotland and the UK. In the context of this first plan, biosecurity issues in the rivers and lochs of Scotland are associated with the introduction and spread of non native invasive species and fish diseases.

According to a survey[12] conducted by Scottish Natural Heritage, there are approximately 1000 **non native species** present in Scotland the majority of which exist in small populations with little impact on native flora and fauna. However, a small but significant proportion of these non native species are **invasive**.

Invasive non native species (INNS) are those that have been transported outside of their natural range and that damage our environment, the economy, our health and the way we live.

According to CBD[13] (2006), **invasive non native species (INNS)** are the second greatest threat to biodiversity, being capable of rapidly colonising a wide range of habitats and excluding the native flora and fauna. Furthermore over the last 400 years INNS have contributed to 40% of animal extinctions where the cause of extinction is known. As water is an excellent transport medium for the dispersal of many of these species, rivers and lochs and their banks and shorelines are amongst the most vulnerable areas to the introduction, spread and impact of these species. The ecological changes wrought by INNS can further threaten already endangered native species and reduce the natural productivity and amenity value of riverbanks, shorelines and their waterbodies.

The threat from invasive species is growing at an increasing rate assisted by climate change, pollution and habitat disturbance with a correspondingly greater socio-economic, health and ecological cost. Many countries including Scotland are now facing complex and costly problems associated with invasive species for example:

- DEFRA[14] have estimated that INNS cost the UK economy at least £2 billion per year.
- In the UK Japanese Knotweed is thought to affect an area roughly the size of London and a report of the Review of non-native Species Policy (2003)[15] has estimated the total cost of its removal using current techniques at £1.56bn.
- A Scottish Government report[16] estimated the potential Net Economic Value loss to Scotland of the introduction of *Gyrodactylus salaris* at £633 million with severe consequences for rural communities.

[12] http://www.snh.org.uk/pdfs/publications/review/139.pdf
[13] http://www.cbd.int/
[14] http://www.defra.gov.uk/wildlife-countryside/wildlife-manage/non-native/index.htm
[15] http://www.defra.gov.uk/wildlife-countryside/pdf/wildlife-manage/non-native/review-report.pdf

- A Forestry Research Report estimates the current cost of clearing the invasive *Rhododendron ponticum* from Argyll and Bute as £9.3m that could rise to £64m in the next 50 years[17].
- Invasive species have already changed the character of iconic landscapes and waterbodies in Scotland reducing the amenity value of those areas.

There is also a growing recognition of the impacts of **translocated species**. Translocated species are native species that have been transported outside of their natural range and they can also have severe ecological impacts. Examples of translocated species that are impacting the ecology of Scotland's rivers and lochs are the Minnow (*Phoxinus phoxinus)* and Ruffe (*Gymnocephalus cernuus*). The Ruffe in particular has decimated the once significant and diverse population of the rare and protected Powan (*Coregonus lavaretus*) in Loch Lomond.

Without some form of coordinated and systematic approach to the prevention of introduction and control of the spread of INNS and fish diseases, it is likely that the ecological, social and economic impacts and the costs for mitigation, control and eradication of these species and diseases will continue to increase. This plan is a first attempt to set out and implement such an approach at a local level for selected species and diseases that significantly impact freshwater fisheries and the aquatic environment.

3.2 Policy and Legislation

Given the high costs for the mitigation, control and eradication of INNS and fish diseases once they are established this plan emphasises the need for prevention and rapid response to the introduction of INNS before they become established. Furthermore, the host of pathways for entry and spread as well as the persistence of many of these species means that a partnership approach involving diverse stakeholders is essential. The partnership approach encapsulated in this plan is a key requirement for increased public awareness and engagement, optimisation of the use of resources and the provision of clear guidance for inter-agency working necessary to address the biosecurity issues of the Outer Hebrides region. These approaches are consistent with the GB Invasive Non Native Species Framework Strategy[18] and the Species Action Framework [19]both of which have been endorsed by the Scottish Government.

The actions presented in this plan will also conform to, and be supported by, UK and Scottish Government legislation associated with the prevention, management and treatment of non native invasive species, fish diseases and parasites:

- Section 14 of The Wildlife and Countryside Act (1981)[20] makes it illegal to allow any animal which is not ordinarily resident in Great Britain, or that is listed on Schedule 9 to the Act, to escape into the wild, or to release it into the wild. It is also illegal to plant or otherwise cause to grow in the wild any plant listed on Schedule 9 of the Act.
- Local Authorities have powers to take action against giant hogweed and Japanese knotweed where it is a threat to the local amenity of an area or if it is considered a statutory nuisance.

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[16] http://www.scotland.gov.uk/resource/doc/1062/0042434.pdf
[17]http://www.forestresearch.gov.uk/pdf/Argyll_Bute_rhododendron_2008_costs.pdf/$FILE/Argyll_Bute_rhododendron_2008_costs.pdf
[18] www.nonnativespecies.org
[19] www.snh.org.uk/speciesactionframework
[20] www.opsi.gov.uk/RevisedStatutes/Acts/ukpga/1981/cukpga_19810069_en_1

- Section 179 of the Town and Country Planning (Scotland) Act 1997[21] that empowers local authorities to serve notice requiring an occupier to deal with any land whose condition is adversely affecting the amenity of the other land in their area.

- The Environmental Protection Act 1990[22] and associated regulations define Japanese Knotweed and Giant Hogweed contaminated soil or plant material as controlled waste and make provisions for their treatment and disposal.

- The Possession of Pesticides (Scotland) Order 2005[23] that regulates the use of pesticides and herbicides for the control and eradication of INNS.

- The Waste Management Licensing Regulations 1994[24] define the licensing requirements which include ''waste relevant objectives''. These require that waste is recovered or disposed of ''without endangering human health and without using processes or methods which could harm the environment''.

- The Controlled Waste (Registration of Carriers and Seizures of Vehicles) Regulations 1991 and the Environmental Protection (Duty of Care) Regulations 1991[25] provide guidance for the handling and transfer of controlled waste.

- The Aquaculture & Fisheries (Scotland) Act 2007[26] has provisions relating to the unauthorised release of fish into inland waters.

- The NetRegs [27] website contains information and guidance on a number of INNS and method of control.

The procedures for the detection, notification and control of fish diseases procedures are already well defined by the fisheries legislation. This stipulates that Marine Scotland[28] acts on behalf of the Government in respect to the suspicion of the presence of notifiable fish diseases and organises and coordinates the response to that outbreak. As such the actions in this plan will raise awareness and provide mechanisms for the realisation of those procedures at the local level.

3.3 Existing Planning Framework

This Biosecurity Plan is a vital link between the above Government led policy, legislation and strategic action and local actions and reflects the provisions and requirements of the following existing plans (see also Table 1):

- Relating to the Outer Hebrides Fisheries Trust Fisheries Management Plan,

- Being recognised by, and contributing to, the West Highland Area and Scotland River Basin District Management Plans (RBMP),

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[21] www.opsi.gov.uk/acts/acts1997/ukpga19970008_en_1
[22] www.opsi.gov.uk/act/acts1990/ukpga_19900043_en_1
[23] www.opsi.gov.uk/legislation/scotland/ssi2005/20050066.htm
[24] www.opsi.gov.uk/si/si1994/uksi_19941056_en_1/htm
[25] www.opsi.gov.uk/si/si1991/uksi_199111624_en_1.htm
[26] www.opsi.gov.uk/legislation/scotland/acts2007/pdf/asp_20070012_en.pdf
[27] www.netregs.gov.uk/netregs/63095.aspx
[28] www.scotland.gov.uk/About/Directorates/Wealthier-and-Fairer/marine-scotland

- Conservation objectives of Special Areas of Conservation and Special Protection Areas, and targets for Sites of Special Scientific Interest, and
- Recognition of the Western Isles Local Biodiversity Action Plan.

Table 1 Identified Actions in the OHFT Biosecurity Plan supporting provisions or requirements of other relevant plans

Provision or Requirement of Existing Plan	Action in Biosecurity Plan
The Scottish District River Basin Management Plan recognises the current and potential threat of INNS throughout Scotland. However, the dataset for INNS particularly riparian species, is not complete.	RBMPs can help facilitate a coordinated and widespread response to biosecurity issues by: • Raising awareness of biosecurity issues • Act as a conduit for national initiatives into the local management sphere • Develop and encourage catchment-based approach to control and environment • This biosecurity plan will be acknowledged and linked to the West Highland Area Management Plan
The Outer Hebrides Fisheries Management Plan • Highlighted local Biosecurity issues and the need for a Biosecurity Plan for the region	This biosecurity plan deals with the need for a biosecurity planning process and also with the individual issues relating to biosecurity raised in the FMP
The Western Isles Biodiversity Action Plan [29] • Raise awareness of the problems associated with species non-native to the Western Isles and encourage the removal of non-native species causing damage to native flora and fauna	This biosecurity plan highlights specific INNS within the Outer Hebrides region and will aim to provide actions that prevent, control and eradicate INNS from the region
Gyrodactylus salaris (GS) Contingency Plan [30]**:** • Strategy to rapidly contain and eradicate Gs if introduced to Scotland	This plan will establish a local surveillance system that will feed into the national reposnse protocols.
Highland Invasives Species Forum Strategy	This plan supports implementation the HISF
Area Management Plan	Falls under Section 5 of the plan as an outstanding action.
Conservation Objectives of Special Areas of Conservation and Special Protection Areas (**SACs and SPAs**) and targets for Sites of Special Scientific Interest (**SSSIs**).	This plan supports the conservation objectives and the 12 designated conservation areas [31] in the Outer Hebrides area.

[29] http://www.cne-siar.gov.uk/biodiversity/index.asp
[30] www.scotland.gov.uk/Topics/Fisheries/Fish-Shellfish/18610/diseases/g-salaris/GsCGrev
[31] http://www.jncc.gov.uk/protectedsites/sacselection/Areamap.asp?area=8

4. The Outer Hebrides Region

4.1 Landscape

The Outer Hebrides, also known as the Western Isles, is an archipelago of islands lying off the north-west of mainland Scotland. The chain of islands has an area of approximately 306,916 ha, with a coastline of approximately 2,700km at the high water mark. There are over 70 named islands in the chain, most of which have been temporarily or permanently inhabited in the past, 11 are currently inhabited.

Much of Lewis and North Uist is characterised by relatively flat open moorland. Mountains up to 800m occur to the south of Lewis (Uig and Pairc), North Harris, and the east coast of the Uists. The coast of the islands encloses extensive sea lochs. These are dominated by narrow fjordic lochs the most prominent of which are Seaforth and Reasort in Lewis and Harris respectively. The Uists contain a number of wide and shallow sea lochs the largest being Loch Maddy in North Uist.

The islands contain over 6000 freshwater lochs, the largest loch being Loch Langabhat in central Lewis and Harris which covers an area of 9Km^2. Loch Suainaval in West Lewis is the deepest loch on the island at 66m and the largest by volume. Loch Bi in South Uist is brackish and tidal, it is a (7Km^2) shallow loch of less than 1m in depth. The lochs are often connected by streams and small rivers and most systems are low altitude. Over a thousand burns enter the sea around the islands.

4.2 Climate

The Outer Hebrides have a temperate maritime climate and there is little variation in temperature across the islands. Winter temperatures fall to around 1.5°C, frost and snow are rare. Average annual rainfall for the islands is approximately 1200 millimetres, but can vary across the islands. The prevailing wind direction is south westerly but the strongest winds are often from the northwest. The relatively mild climate of the Outer Hebrides may favour the establishment and persistence of INNS.

4.3 Use of Catchment

Moor and hill land provides rough grazing, primarily for sheep but increasingly for cows. It is used extensively for outdoor pursuits including angling, deer stalking, game shooting, bird watching and hill walking. Small areas of land have been fertilized to improve grazing and sometimes run off temporarily increases the fertility of nearby water courses. Fertile and well-drained machair soil along the coasts of the isles (particularly the west coast of the Uists) is favoured for grazing and small amounts of arable farming. The council, Comhairle nan Eilean Siar, has initiated small native-tree planting schemes across the islands, where these occur close to rivers they provide valuable food and cover for fish.

Some industry occurs around the town of Stornoway (North Lewis). Outwith Stornoway industry is largely limited to small fish hatcheries and processors, tweed mills, ferry and fishing harbours, small quarries and community windfarms. Three large windfarms have been proposed for Lewis; if they go ahead this industry will cover large areas of Lewis including land close to water courses.

Salmon farms are common in both freshwater and sea lochs throughout the islands, the sea lochs include the most heavily farmed lochs in Scotland. Mussel farming is also common. In 2009, there was estimated to be 16 aquaculture production companies employing 160 full time employees in the area[32].

Water courses have commonly been altered for small hydroelectric schemes, reservoirs, and fish farms. Water abstractions are registered with SEPA for 45 catchments and 23 of these are associated with dams to impound water. Historically fisheries have also stored water to create artificial spates, this practice is uncommon now but many dams and sluices remain.

4.4. Biosecurity: Current and Future Threats

4.4.1 Current Threats

On a national level the Outer Hebrides should contain relatively pristine freshwater environments with distinct sources and pathways for the introduction of INNS. Being an island chain there should be a natural barrier to the introduction of INN aquatic species, and therefore the majority of introduction pathways can be linked to human activity and movement between the islands and the mainland. The known distribution of INNS presented below is based on data from the NBN gateway[33], and the OHFT's current knowledge. No specific surveys for INNS have been carried out by OHFT, and this must be one of the priorities for action from stakeholders following the production of this plan.

Terrestrial species

- **American mink *(Mustela vison)*** were released into the wild in Lewis in 1969 and spread through Harris, across the Sound of Harris, to North Uist and eventually down to South Uist. The Hebridean Mink Project (HMP) is currently aiming to eradicate Mink from the Outer Hebrides. Mink spread by migration and kill water fowl, small mammals and juvenile salmonids.

- **Rhododendron (*Rhododendron ponticum & hybrids*)** are widespread throughout the island chain. Populations are usually associated with residential areas and hunting/fishing estate lodges. The Stornoway Castle grounds represent a significant population that in parts dominate the riparian habitat of River Creed. Rhododendron spreads by natural seed and vegetative dispersal after intentional planting in gardens, parks and demesnes. It forms dense thickets and out-competes native plants for space and resources, especially sunlight with impacts on fish and invertebrate communities as well as preventing site access.

- **Japanese knotweed (*Fallopia japonica*)** has a patchy distribution throughout the islands, but has been recorded on Lewis, Harris, North Uist, South Uist and Barra. It spreads along rivers and the coast by movement of plant fragments and is found in many other areas through the movement of plant debris in soil and on vehicles. It forms dense thickets excluding native plants and prohibiting regeneration and access reducing biodiversity and altering the habitat for wildlife. It can also cause damage to building structures and has been known to penetrate concrete.

[32] http://www.cne-siar.gov.uk/windpower/index.asp
[33] www.nbn.org.uk

- **Common cordgrass (*Spartina anglica*)** has been reported in one location in South Harris. It has been present in its current location for some time but has not shown signs of spreading. It is a perennial salt marsh grass which has been planted widely to stabilise tidal mud flats.

- **Giant rhubarb (*Gunnera sp.*)** is well established in a number of locations throughout the islands. Gunnera reduces the biodiversity value of infested sites. It can lead to the local extinction of some species with the formation of almost monospecific stands of Gunnera. This species can also cause problems by blocking drainage ditches and also access ways for people.

The American Mink is present throughout the island chain

The European Minnow is present in one catchment in South Harris

Aquatic species

- **Canadian pondweed (*Elodea Canadensis*)** and **Nutall's pondweed (*Elodea nutallii*)** have been recorded in a number of locations in South and North Uist. They are spread by disposal of plants or plant fragments near waterways, escapes from garden ponds during flood episodes and possibly by birds and other animals. These pondweeds dominated native macrophyte communities which can lead to their extinction and thereby impacts local invertebrate communities. Canadian pondweed can also increase metal loads within waterbodies that compounds its impacts on native flora and fauna.

- **European minnow (*Phoxinus phoxinus*)** have been found within one catchment in South Harris, investigations are ongoing regarding options for monitoring or control. It is not native to Scotland, but has spread rapidly northward from the South-East of England, particularly by anglers as discarded 'livebait' and through deliberate introductions as a food for trout. Research from other areas indicates that minnows compete for habitat and resources to the detriment of native species, particularly juvenile salmonid fish.

- **Rainbow trout *(Oncorhynchus mykiss*)** have been historically stocked in a number of fisheries on the islands. Whilst not known to reproduce in Outer Hebrides waters this practice can potentially increase competition for limited resources.

4.4.2. Potential Future Threats

The invasive non native species that are not currently present within the Outer Hebrides region are listed in Tables 2 and 3. They have been classified as high or medium level threats depending on the impacts of each of the new species pose to the local economy and bio-diversity in combination with the likelihood of their introduction. The level of risk of introduction was based on the pathways for the introduction of INNS, their current geographic proximity and the uses within the OHFT area.

High Threat: Species with **Severe** consequences for local bio-diversity and economy and a **High** to **Medium** risk of introduction

Medium Threat: Species with **Moderate** consequences for local bio-diversity and economy with a **Low** to **High** risk of introduction

T**able 2** High threat level species due to their impacts and/or risk of introduction

SPECIES	RISK OF INTRODUCTION	POTENTIAL LOCAL IMPACTS
Gyrodactylus salaris (Freshwater external parasite of salmon)	**High**- Through unintentional introduction from anglers and water sport enthusiasts through: ▪ contaminated fish ▪ clothing/equipment which has been in contact with infected water including canoes ▪ Ballast water	▪ Projected catastrophic impact on salmon *(Salmo salar)* populations throughout Scotland. (It has largely exterminated *S. salar* in 41 Norwegian rivers)
North American signal crayfish (*Pacifastacus leniusculus*) Freshwater Crustacean	**High** – Through introduction from anglers, water sport enthusiasts from other populations in Scotland through: ▪ Deliberate introduction ▪ Accidental introduction with transported fish ▪ Ballast water ▪ clothing/equipment which has not been properly cleaned following use	▪ Can both compete with and predate on native fish species such as Salmon and trout ▪ Burrowing damages river banks
Himalayan balsam *(Impatiens glandulifera)*	**High –** Introduction from existing populations throughout Scotland through: ▪ Garden trade ▪ Disposal of garden waste ▪ Transport of contaminated soil	▪ Forms thick monospecific stands and shades out low level native plants reducing biodiversity and denuding river banks of understory vegetation. ▪ Winter dieback of the plants exposes soil to erosion and so promotes spread and siltation of riverbed

SPECIES	RISK OF INTRODUCTION	POTENTIAL LOCAL IMPACTS
Giant hogweed *(Heracleum mantegazzianum)*	**High – I**ntroduction from existing populations throughout Scotland through: ▪ Transport of contaminated soil ▪ Seed dispersal particularly by water	▪ Out competes native vegetation for space and resources shading out desirable vegetation. ▪ This results in loss of plant and invertebrate diversity. ▪ Winter dieback increases exposes bare soil to direct rainfall and floods. Death of stem loosens surrounding soil that in high density stands can result in whole sections of riverbank being washed out. ▪ Giant Hogweed is a public health hazard as the toxins in the sap react with sunlight/UV ray causing the skin to blister and severe scarring. ▪ Can block access and rights of way
Australian swamp stonecrop *(Crassula helmsii)*	**High** – Through introduction from existing populations in Scotland other pathways include: ▪ Garden trade ▪ Disposal of garden waste ▪ Secondary spread by animals and human activity	▪ Suited to a wide range of slow moving freshwater systems. ▪ Outcompetes native species. ▪ Forms dense carpets choking ponds and ditches. ▪ Reduced light levels below the rafts can cause die off of waterweeds and algae and reduce water oxygenation levels
Zebra mussel (*Dreissena polymorpha)* Freshwater Bivalve	**Medium –** Present in Ireland. Possible introduction through unintentional introduction from contaminated boat hulls and engines and bilge water.	▪ Major economic impact on all subsurface water structures e.g. blocking pipes and impacting hydro-electric schemes ▪ Varied and unpredictable ecological impacts including changes to freshwater nutrient cycles, extinction of local mussels, changes to stream substrate affecting spawning areas
Chinese mitten crab *(Eriocher sinensis)* Resides in freshwater but migrates to the sea for breeding.	**Medium –** Present in NE England. Possible introduction through unintentional introduction from boat hulls, ballast water and live food trade.	▪ Burrowing in high density populations damages river banks ▪ Concern over impacts on local species ▪ Intermediate host for the mammalian lung fluke *Paragonimus ringer,* known to infect humans
Didemnum Tunicates / sea squirts *(Didemnum vexillu, Didemnum spp)*	**Medium –** Present in Ireland and Wales. Possibility of unintentional introduction from marine fishing boat hulls or contaminated aquaculture equipment.	▪ Marine habitat changes through overgrowth of sedentary benthic organisms such as seaweed, scallops, mussels and oysters ▪ Produces chemicals that deter most fish and other animals ▪ Increases fouling of underwater structures such as docks, moorings and boat hulls ▪ Increased fouling also interferes with fishing, aquaculture and other coastal and offshore activities

Table 3 Medium level threat INNS and their risk of introduction.

INNS	THREAT	PRESENCE IN UK	POSSIBLE SOURCE OF INTRODUCTION
Ruddy duck *(Oxyura jamaicensis)*	**Medium**	Patchy distribution in Scotland	Could migrate from a number of locations in Eastern Scotland
Slipper limpet *(Crepidula fornicate)*	**Medium**	Present in three locations in Scotland	Unintentional introduction from boat hulls and ballast water
Water primrose *(Ludwigia grandiflora)*	**Medium**	Present in north-west England	Unintentional introduction from boat hulls and the pond and garden trade
Water fern *(Azolla filiculoides)*	**Medium**	Present in isolated populations	Through intentional/unintentional introduction from numerous locations throughout Scotland, especially central belt
Curly waterweed *(Lagarosiphon major)*	**Medium**	Found in a small number of locations throughout Scotland especially in the central belt area	Possible introduction from garden and/or pond trade, fragmentation exacerbated by wind dispersal, boat movement, angling equipment and possibly water fowl
Wireweed *(Sargassum muticum)*	**Medium**	Present in several locations on the west coast of Scotland	Unintentional introduction from marine fishing boat hulls
Orfe *(Leuciscus idus)*	**Low**	Present in approximately 10 locations in Scotland	Through intentional/unintentional introduction from an existing populations on mainland Scotland
Ruffe *(Gymnocephalus cernuus)*	**Low**	Present in Loch Lomond, Forth & Clyde Canal	Currently recorded in central Scotland and could be introduced as live bait or in ballast water
Bullhead *(Cottus gobio)*	**Low**	Present in Forth, Clyde and Tweed catchments	Could be introduced deliberately or as live bait
Large flowered waterweed *(Egeria densa)*	**Low**	Only found, to date, in East Lothian	Possible introduction from garden and/or pond trade
Floating pennywort *(Hydrocotyle ranunculoides)*	**Low**	Currently only in England up to the midlands	Possible introduction from garden and/or pond trade
Parrot's feather *(Myriophyllum aquaticum)*	**Low**	Present in two locations in southern Scotland	Through intentional/unintentional introduction from two existing populations in the south of Scotland
Fanwort *(Cabomba caroliniana)*	**Low**	Only found in one location in southern Scotland	Possible introduction from garden and/or pond trade
Asian topmouth gudgeon *(Pseudorasbora parva)*	**Low**	Currently only recorded from 5 locations in England.	Could be introduced as live bait, in ballast water or through aquaria trade

4.4.3. Fish Health and Genetic Issues

There are a number of diseases and parasites that have potential to cause catastophic or significant impacts on fish health and affect the fishery resource. Similarly, the introduction of non-native genotypes of species already present may undermine productivity of native species and act as a vector for the spread of fish diseases. The influence of fishery management and aquaculture activities on the productivity of native fish communities and fisheries is of growing concern a the potential biological and ecological imacts are becoming better understood.

Parasites & diseases

Restrictions on the import into the UK of live fish have played a major part in preventing the introduction and spread of serious fish diseases. Health conditions of aquaculture animals are today governed by the Fish Health Regulations 1997 legislation that have three categories of Notifiable Diseases in Fish[34] depending on their potential impact on the Scottish aquaculture industry and wild fish stocks.

List I diseases are those which have a serious economic impact and are exotic to the EU, including:

- Infectious Salmon Anemia (ISA)

List II diseases are those which are present in the EU, but approved zones and approved farms in nonapproved zones can be distinguished. These include:

- Viral Haemorrhagic Septicaemia (VHS)
- Infectious Haematopoetic Necrosis (IHN)

List III diseases are those for which individual Member Stated can decide whether to put control measures in place or not, including:

- Infectious Pancreatic Necrosis (IPN)
- Bacterial Kidney Disease (BKD)
- Furunculosis
- Spring Viraemia of Carp (SVC)
- Gyrodactylus salaris (GS)
- Enteris Redmouth Disease (ERM)

The biggest current threat to Atlantic salmon populations and the fisheries they support is the parasite **Gyrodactylus salaris (GS)**. The potentially catastrophic consequences of its introduction mean that it is a priority for fisheries and aquaculture industries to identify and mitigate potential vectors.

Non-native genotypes

Many fishery and aquaculture activities utilise non-native genotypes of Atlantic salmon and Brown trout for angling amenity and/or production of fish for the table market. It is now well understood that stocking fish from non-native sources can undermine the short and long-term productivity of wild fisheries. Breeding and competitive interaction between native and introduced fish is likely to produce offspring that have reduced survival and lower reproductive success[35]. Preventing or at least limiting release of non-native genotypes likely to interact with wild populations is essential to avoid short and long-term genetic and ecological impacts on wild fish populations.

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[34]http://www.marlab.ac.uk/Delivery/Information_resources/information_resources_view_documents.aspx?resourceId=23697&documentId=1922

[35] McGinnity et al. 2003. Fitness reduction and potential extinction of wild populations of Atlantic salmon, *Salmo salar,* as a result of interactions with escaped farm salmon. Proc Biol Sci. 270 (1532)

4.4.4. Pathways for Introduction

Likely sources and pathways for new introductions of INNS to the Outer Hebrides region are the unintentional commercial or private introductions of fish and plant species. The Outer Hebrides has five ports (Stornoway, Tarbert, Lochmaddy, Lochboisdale and Castlebay) operating both freight and vehicle/passenger ferries to various locations on the west coast of Scotland (see fig.1). There are also numerous small fishing ports and harbours throughout the island chain that could act as potential routes for introductions. Stornoway, Benbecula and Barra also have airports with links to various mainland airports throughout Scotland. Anglers, watersports enthusiasts and commercial fish farms should also be considered as potential pathways for the introduction and translocation of the INNS and fish diseases listed.

With the introduction of the Road Equivelant Tarriff (RET) for ferry journeys to and from the islands in 2008, the movement of people and goods between the islands and the mainland will become more frequent. This will increase the opportunities for the introduction of INNS to the Outer Hebrides region and should therefore be recognised by this plan.

From the above we can propose that the main pathways for the introdcution of INNS to the Outer Hebrides region are:

- Intentional introduction or planting
- Fouling and ballast water of marine vessels
- Fouling and ballast water of freshwater vessels
- Sale from garden or pond centres
- Escapes from fish farms, ponds, gardens, demesnes
- Fish from the aquaculture industry as disease vectors
- Escapes from the aquaculture and stocked fisheries industries
- Contaminated aquaculture equipment
- Contaminated water sports equipment (e.g. from anglers, canoeists)
- Movement of contaminated soils or vehicles
- Improper control and disposal measures e.g. cutting and dumping without treatment.

The relative remoteness and the pristine freshwater environments of the Outer Hebrides area make the introduction of INNS a significant threat to our freshwater environments. Therefore the prevention and early detection of introductions of INNS to the islands should be a high priority for all stakeholders.

4.4.5. The Stakeholders

This plan seeks to engage and involve a wide range of decision makers operating at the local, regional and national scales, most of which have their own policies and plans that influence or cross-over with fishery management issues:

- Scottish Government
- Scottish Natural Heritage (SNH)
- Comhairle nan Eilean Siar (CnES)
- Highland Council
- Scottish Environment Protection Agency (SEPA)
- West Highland Area Advisory Group (WHAAG)
- Marine Scotland (MS)
- Royal Society for the Protection of Birds (RSPB)
- Western Isles Salmon Fisheries Board (WISFB)
- Outer Hebrides Fisheries Trust (OHFT)
- Scottish Government Rural Payments and Inspectorate Division (SGRPID)
- Caledonian Macbrayne (CalMac) Ferries Ltd
- Local Port Authorities
- Scottish Crofting Foundation
- Fishery Managers/Estate Owners
- Aquaculture Companies
- Tripartite Working Group
- National Farmers Union
- Scottish Water
- Local Angling Clubs/Associations
- Canoe/Rambling Associations
- Local Land Managers
- Local Commercial Interests

Its is important for the biodiversity of the Outer Hebrides region that every effort is made to involve as wide a variety of stakeholders as possible at all stages of an INNS introduction. Establishing clear and logical lines of communication between stakeholders will allow rapid response and effective management of any new INNS introduction to the islands. As such OHFT will work with the key stakeholders identifed to establish clear points of contact for all enquiries regarding INNS in the Outer Hebrides.

4.5. Existing INNS programmes in the Outer Hebrides region

Gyrodactylus salaris

The OHFT and Western Isles Salmon Fisheries Board (WISFB) are working with key stakeholders to raise awareness of the threat and impact of Gyrodactylus and to prevent its introduction through the use of disclosure forms, leaflets and signposts. The introduction of *Gyrodactylus salaris* to Scotland would result in devastating affects on wild and commercial fisheries, and the rural communities that rely on these fisheries for income. *Gyrodactylus salaris* has largely exterminated *Salmo salar* in 41 Norwegian rivers. A study commissioned by OHFT in 1999 showed that the capital value of Outer Hebrides fisheries was estimated to be around £17 million and indirect earnings were valued at around £6 million annually. Freshwater fisheries were found to support at least 260 full time equivalent jobs (3% of the working population)[36]. With the advent of the Road Equivalent Tariff for ferry journeys to and from the islands, in 2008, and more regular flights to the mainland, it would not be unreasonable to suggest that freshwater fisheries contribute more to the local economy in 2009 than they did in 1999. Therefore, the introduction of a species such as *Gyrodactylus salaris* to the islands would constitute a significant environmental and economic threat.

American Mink

In 2001 SNH Western Isles set up the Hebridean Mink Project, with the following aims:

1. protect vulnerable ground-nesting bird populations on North Uist, Benbecula and South Uist by the removal of mink from these islands.
2. reduce mink populations on South Harris to the extent that the risk of recolonisation of North Uist is minimised
3. collect data on effective control methods
4. assess the effects of mink removal on the status of protected bird species.
5. promote an awareness of bird conservation issues and the international importance of the Western Isles, including the risks posed by mink to island populations, and to disseminate the findings amongst other European countries facing similar problems.

The Project is also supported by the local council (CnES), the RSPB, OHFT, The Highlands & Islands Enterprise (HIE), and the Esmee Fairbairn Foundation, as well as local landowners and tennants.

Although initially established to protect the ground-nesting birds of the islands, the benefits for biodiversity and biosecurity in the Outer Hebrides are many. Through the project Mink have recently been eradicated from the Uists (Phase 1), and their removal from Harris and Lewis (Phase 2) has also begun.

This biosecurity plan will support these projects and use the lessons of both in future work associated with the preventioin, control and eradication of INNS.

[36] James, M.A. (2000) Assessing the Economic Value and Realising the Potential of Recreational Freshwater Fisheries in the Western Isles. p. 90. Outer Hebrides Fisheries Trust.

Highland Invasive Species Forum

Formed in June 2008 its aims are to:

- bring together the key players and take stock of the situation regarding invasive non-native species in Highland;
- raise awareness and spread good practice;
- identify any major gaps and prioritise key areas for future work; and
- work together to secure new resources and funding.

The forum has identified five key INNS, *Rhododendron ponticum*, Japanese knotweed, Himalayan balsam, giant hogweed and mink as high priority species and recently completed mapping their distributions in the area. A strategy has been produced and a Highland Rhododendron Officer appointed. The forum collaborates with the RAFTS Biosecurity and Invasive Species Programme and also supports control work of riparian INNS being undertaken by four fisheries trusts in the Highlands.

5. Biosecurity Management Strategy

The objectives of this plan will be achieved through a partnership approach to implement the following actions in relation to selected INNS:

- Prevention,
- Early detection, surveillance, monitoring and rapid response,
- Mitigation, control and eradication

This section describes the expected outputs from implementation of this plan and the actions required for their realisation. Agreed actions for **prevention** are focussed on the disruption of the pathways for the introduction and spread of selected INNS, translocated species and fish diseases and include a mixture of awareness raising and practical measures. Awareness activities take note of the GB Awareness and Communication Strategy. Increased probability of **early detection** of the introduction or spread of INNS is realised through surveys to establish the location of existing populations, establishment of a coordinated local surveillance and reporting system supported by routine **monitoring** of established populations or sites vulnerable to the introduction and spread of these species. **Control and eradication** activities will be undertaken in a systematic and coordinated manner to prevent re-infestation from upstream sources.

5.1. Objectives and Outputs

Objective 1: Reduce the risk introduction and spread of identified INNS, within the Outer Hebrides Region.

> ***Output 1.1:*** *Key stakeholders aware of the impacts and measures required to prevent their introduction and spread*

Awareness activities will be focussed on addressing the identified local priorities as well as supporting the GB Awareness and Communication strategy and its key messages to the general public:

- INNS are any non-native animal or plant that has the ability to spread causing damage to the environment, the economy, or health and the way we live
- Invasive non-native species damage our environment, the economy, our health and the way we live
- We require the support of stakeholders to increase awareness and better understanding of INNS issues and impacts
- Invasive Non Native Species:
    - Threaten our native plants, animals and habitats
    - Cost the British economy between £2 - £6 billion each year
    - Can threaten our health

The local priorities for awareness will focus on disturbing the pathways for the introduction and spread of INNS in the Outer Hebrides region. The Key stakeholders, the identified areas of priority and the proposed mechanisms for delivery are presented in Table 4 below. The roles and actions of key government agencies and non governmental bodies in promoting awareness of INNS issues are presented in Table 5.

Table 4: Priority areas for awareness and delivery mechanisms according to stakeholder group

Stakeholder Group	Priority Area	Mechanism of Delivery
Aquaculture (SSPO, TWG) and local fish farm companies	- Impact of INNS - Use of sufficient screens and other biosecurity measures - Dangers of importing stock from contaminated areas - Controls on movement of stock and water	- OHFT to liaise with local industry and trade associations to advise members regularly of best practice in respect of INNS - Enforcement agencies (FHI) to undertake site visits to discuss and advise on issues involving INNS - Incorporation of INNS codes of good practice into TWG agreement - Incorporation of INNS codes of good practice into SSPO industry codes of practice - Invasive Species Scotland [37]website
Port Authorities	- Avoid pumping out of non sterilised ballast water in harbours - Role of hull fouling in introduction and spread of INNS	- Promote implementation of code of practice requiring non-sterilised ballast water to be discharged away from harbour - Formulate and implement an interim code of practice requiring non-sterilised ballast water to be discharged on the ebb tide and away from harbour area - OHFT to assist with supply of posters and other awareness material for display and signage - Invasive Species Scotland website
Local Garden Centres	- Promotion of existing codes of best practice covering the security and disposal of INNS to all garden centres	- OHFT to work with garden centres to encourage distribution of codes and posters (available from Plantlife) and to advise the general public of INNS issues

[37] www.invasivespeciesscotland.org.uk

Stakeholder Group	Priority Area	Mechanism of Delivery
	- Target gardeners to dispose plant material and/or soils in a responsible manner	
Local Aquarium and Pond stockists	- Promote code of practice to all pet shops and suppliers of ornamental fish - Target aquarists and pond keepers to dispose of unwanted animals or plants in a responsible manner	- OHFT to work with retailers to encourage distribution of codes and posters (available from Plantlife)
Water User associations (canoeists, sailing clubs)	- Promote awareness to clubs and participants of the dangers arising from INNS and Gs - Identification of suitable persons to act as ''eyes''	- OHFT to work with associations to promote disinfection of equipment and provide appropriate facilities to eliminate the risk of accidental transfer of INNS - FACT campaign and website - Invasive Species Scotland website
Landowners	- Promote knowledge of biosecurity issues amongst all tenants and resource users - Identification of suitable persons to act as ''eyes''	- Work with OHFT to ensure dissemination of best practices and appropriate signage to reduce threats from INNS - OHFT to offer training for ''eyes'' - Invasive Species Scotland website
Angling clubs/associations	- Promote knowledge of biosecurity issues amongst all members and visiting anglers - Ensure the distribution of information and erection of signage in fishing huts and recognised car parks - Recommend suitable members to act as ''eyes''	- Work with OHFT to ensure dissemination of best practices and appropriate signage to reduce threats from INNS - OHFT to work with associations to promote disinfection of equipment and provide appropriate facilities to eliminate the risk of accidental transfer of INNS - OHFT to offer training for ''eyes'' - Invasive Species Scotland website
General Public	- General awareness of impacts and measures to prevent/control INNS	- Local media campaigns - Use of websites (RAFTS, NNSS) - OHFT to develop a leaflet to promote the Biosecurity plan, the dangers arising from INNS and the reporting system - Promote the Biosecurity Plan to all - Invasive Species Scotland website
Schools	- General awareness of impacts and measures to prevent/control INNS	- School visits focusing on ecological clubs and encouraging appropriate field trips - OHFT to extend 'Salmon in the Classroom' themes to include INNS
Contractors / Ground Maintenance Workers	- General awareness of impacts and measures to prevent/control INNS	- Work with OHFT to ensure dissemination of best practices - OHFT to offer training for ''eyes'' - Invasive Species Scotland website
The Scottish Government Rural Payments and	- General awareness of impacts and measures to prevent/control INNS	- Work with OHFT to ensure dissemination of best practices - OHFT to offer training for ''eyes''

Stakeholder Group	Priority Area	Mechanism of Delivery
Inspectorate Division (SGRPID)		- Invasive Species Scotland website

Table 5: Roles and/or actions of key government and non government agencies in promoting awareness of INNS issues

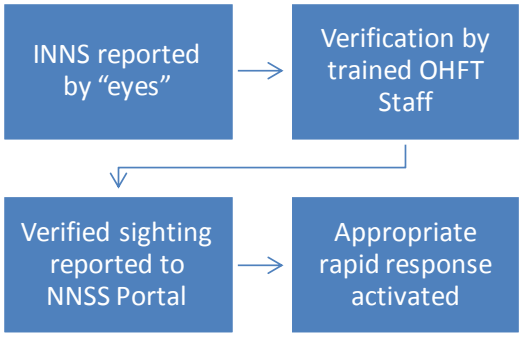
Stakeholder Group	Priority Area	Mechanism of Delivery
OHFT	- Promote awareness to general water users of the Biosecurity Plan and highlighting the dangers from INNS	- Promote and launch of Biosecurity Plan - Develop a leaflet to promote the Biosecurity Plan, the dangers of INNS and the reporting system and ensure appropriate distribution to stakeholders - See actions for OHFT above
WISFB	- Continue to promote awareness to anglers of the dangers arising from INNS	- Continue to promote disinfection of equipment and provide appropriate facilities
Comhairle nan Eilean Siar	- Promote use of codes of best practice for construction, haulage, horticulture, aquaculture amongst local businesses and relevant departments particularly construction, garden and pet trade - Promote awareness of planning, waste disposal and transport regulations amongst local businesses - Promote awareness of the GB communications strategy to the general public	- Councils to promote codes of best practice at every opportunity e.g. including them with planning applications and building warrants - Production and distribution of information leaflets on all legislation relevant to INNS - Holding of awareness event/open day to promote biosecurity issues - Distribute leaflets with council tax bills - Display posters (produced by RAFTS) in council offices, libraries and other public places
SEPA	- Clarify SEPA responsibilities for INNS to both staff and customers - Incorporate INNS issues into relevant guidance documents (as they are developed or updated)	- Page on website with links to relevant SEPA information and other sites e.g. Non-Native Species Secretariat, RAFTS, Scottish Canoe Association - Digital documents available for download on SEPA website
SNH	- Promotion of good practice in the prevention, control and eradication of INNS - Provision of funding for local INNS initiatives	- Holding of SNH Sharing Good Practice events - Grant funding may be available for some projects
Marine Scotland	- -Fish Health Inspectorate part of Marine Scotland is lead body with respect to fish diseases and escapes	- Undertake site visits to discuss and advise on issues involving INNS - - Promote disinfection of equipment and provide appropriate facilities to eliminate the risk of accidental transfer of INNS

Objective 2: Establish optimum surveillance, detection, monitoring and rapid response systems for identified INNS

Output 2.1 *Early warning systems for surveillance, detection and monitoring of new and existing INNS in the region established*

The "eyes" of the early warning system (Box 1) will be trained members of the public, bailiffs, ghillies, canoeists and walkers, with reported sightings verified by trained OHFT personnel. A sighting of a GB or local high priority species (Table 6) will be verified as soon as practical, preferably within 48 hours. If confirmed, it will initiate the appropriate GB or local high priority response (see Output 2.2 below). Reports of priority species will be verified as time permits. All verified sightings will also be entered onto the OHFT Geographic Information System to monitor INNS distributions within the Outer Hebrides Region.

Box 1. Early warning system



Output 2.2 *Rapid response mechanism (RRM) established and functioning*

The type of response will depend on the severity of the species detected (Table 6) and is proportionate to the threat posed. There are three levels of response:

- a GB level response that will be undertaken by national governmental institutions as part of the GB INNS strategy
- a high priority local rapid response
- a priority local rapid response

Table 6: Response level for the selected Invasive Non Native Species

GB Response	High Priority Local Response	Priority Local Response
Gyrodactylus salaris	North American Signal Crayfish	American Mink
Asian Topmouth Gudgeon	Mitten Crab	Canadian Pond Weed
Ruddy Duck	Slipper Limpet	Nuttal's Pond Weed
Didemnum spp	Zebra Mussel	Japanese Knotweed
Wireweed	Ruffe	Rhododendron
Water primrose	Bullhead	Rainbow Trout
	Australian Swamp Stonecrop	Minnow
	Large flowered waterweed	Red Vent Syndrome
		Himalayan Balsam
		Giant Hogweed
		Water fern
		Parrot's feather
		Curly Waterweed
		Orfe
		Common cord grass
		Fanwort
		Floating pennywort

There are likely to be some species which will not qualify for a GB rapid response which are considered priorities at a Scottish level and action may therefore be instigated by Scottish agencies for the Scottish Government. There is no agreed species list at present; this work is being taken forward by the Scottish Working Group on Invasive Non-Native Species and once agreed, will be circulated to all interested.

A confirmed sighting of a GB priority species will trigger the GB contingency plan for that species e.g. *Gyrodactylus salaris*. However, there is still a need for local level protocols to link with the GB response, as well as for local level contingency plans for local priority species. The elements to be included in the response to detection of a GB priority species or the contingency plans for local priority species are outlined in Table 7.

Table 7 Elements of contingency plans or protocols for response to GB priority, local high priority and priority species

GB Response	Local High Priority Response	Local Priority Response
-Report to local and GB institutions -Determine the extent of infestation -Isolate area where practical and desirable	-Report to local and GB institutions -Determine the extent of infestation - Isolate area where practicable Establish source and check related sites - Closure of all pathways -Decide on appropriate action eradication/containment. - Approve eradication methodology -Monitor	-Report to local and GB institutions -Determine the extent of infestation -Survey in course of normal work to establish and map distribution -Include new areas in existing eradication/control programmes - Identify and close all pathways - Monitor as part of planned catchment monitoring programme

Output 2.3 *– Develop strategic monitoring of INN species in region.*

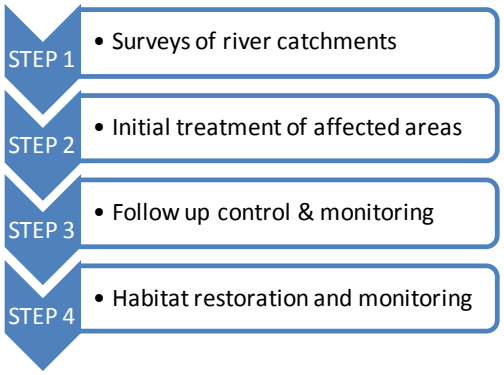
The OHFT will work with Scottish Fisheries Coordination Centre, SEPA and SNH to develop and agree national protocols for INNS surveying and monitoring as well as ensuring that INNS data is stored in a format which can readily be shared using GIS. A standardised SFCC recording sheet and data storage protocol would ensure compatibility with existing SFCC habitat data. Manuals on methodologies will be produced and staff trained to ensure that high quality data is collected, stored and shared between agencies.

Objective 3: Develop effective control and eradication programmes for existing INNS that pose significant threats to local riparian and aquatic biodiversity and the island's economy

Output 3.1 *Effective sustainable control/eradication programmes within the Outer Hebrides region are established and fully functional*

Surveys will identify INNS distributions within the Outer Hebrides region. Survey information will be entered onto GIS and analysed to target nascent and "upstream or source" populations of INNS that are potential sources of spread and re-infestation. Control and eradication programmes will be phased with treatment commencing at the upstream point of distribution and then systematically progressing downstream. A combination of specialist contractors, volunteers and OHFT/WISFB staff will be used depending on the management requirements of the area involved.

Box 2. Control and Mitigation



Output 3.2 *Outputs and proposed activities associated with the plan are reported to and discussed with the West Highland Area Advisory Group (WHAAG) and the Local Biodiversity Action Plan (LBAP) Steering Group*

The sustainable and effective implementation of biosecurity measures at the local level would be facilitated by using existing groups, such as the WHAAG and the LBAP Steering Group. The actions outlined in this plan are directly related to the objectives of both the WHAAG and LBAP and therefore the implementation of this Biosecurity Plan for the local region would be appropriately run through these groups.

5.2. Monitoring

Biosecurity planning has been initiated within the Outer Hebrides Region by the OHFT through the preparation of this plan. Progress in implementing the plan will be determined by the level of engagement, support and commitment of the stakeholders and partners to deliver action against shared priorities. That is now the challenge for all parties as we seek to deliver the objectives this plan.

To ensure the effective implementation of this plan, it is vital that the outcomes and impacts of the actions are monitored and reviewed to ensure that the objectives are being met. Thus a coordinated monitoring programme must be established to ensure efficacy and sustainable treatment initiatives and include:

- Assessment of efficacy of surveillance and rapid response systems
- Occurrence and distribution of the selected INNS within the Outer Hebrides region
- Effectiveness of control/eradication programme including:
    - Application/delivery of effective concentrations of biocides
    - Checking that treatments have been effective

- Re-treating immediately where there is doubt
- Monitoring any apparent resistance to treatments and investigate
- Surveying the area for signs of dormant plants becoming activated

- Assessment of the ability to close established pathways of transmission
- Monitoring the effectiveness of all legislation and codes of practice especially those which are aimed at restricting/closing pathways
- Monitoring general activities within the region and assessing them in terms of risk for the introduction of INNS.

Monitoring activities will be undertaken by OHFT staff in conjunction with stakeholder representatives who will be aware of local initiatives and priorities for action.

5.3. Action and Timetables

This section presents the actions required to realise the objectives and outputs described in section 5.1 – 5.3, along with the lead agency, key partners and timeframe required for their implementation.

Table 8: Required actions, lead agency, key partners and timeframe according to the objective and output.

ACTION	LEAD	PARTNERS	TIMEFRAME						
			2009	2010	2011	2012	2013	2014	2015
Objective 1: Reduce the risk introduction and spread of identified INNS, within the Outer Hebrides Region.									
Output 1.1: Key stakeholders aware of the impacts and measures required to prevent their introduction and spread									
Launch of OHFT Biosecurity plan through national and local – create press release	OHFT	RAFTS, SG, NNSS, SEPA, SNH		—					
Produce leaflet on legislation including waste management & planning regulations	CnES	SNH, AAG		——					
Produce leaflet(s) on biosecurity issues and the reporting system	OHFT	SNH, AAG		—					
Produce poster(s) on biosecurity issues and distribute to the general public	OHFT	RAFTS, SNH, AAG, Plantlife		·····	·····	·····	·····	·····	·····
Promote and install disinfection facilities for anglers at all angling proprietors fishing huts/parking points	WISFB	OHFT		·····	·····	·····	·····	·····	·····
Develop interim Code of Practice with Local Port Authorities	Port Authorities, CnES	OHFT, SEPA		——	——				
Distribute Codes and posters to relevant retail outlets and clubs at open days and events such as agricultural shows	Highland Invasive Species Forum	CnES, SNH, SEPA		·····	·····	·····	·····	·····	·····
Engage with Landowners and angling clubs to promote awareness measures to tenants, resource –users, members and visitors	OHFT	SNH, SEPA		——	——				
Work with environmental groups and local schools to enhance awareness of INNS	OHFT	SNH , CnES		·····	·····	·····	·····	·····	·····

ACTION	LEAD	PARTNERS	TIMEFRAME						
			2009	2010	2011	2012	2013	2014	2015
Objective 2: Establish optimum surveillance, detection, monitoring and rapid response systems for identified INNS									
Output 2.1 Early warning systems for surveillance, detection and monitoring of new and existing INNS in the region established									
Train OHFT personnel in the identification of INNS	SNH, RAFTS	OHFT							
Train OHFT as trainers	SNH, RAFTS	OHFT							
Work with user and interest groups to identify "eyes"	OHFT	All							
Training of "eyes"	OHFT	SNH, SEPA							
Produce database to record and manage INNS sightings	OHFT	RAFTS							
Establish, test and refine communication mechanisms within 'early warning' system	OHFT	RAFTS , SEPA (National)							
Monitor and periodically evaluate efficacy of surveillance system	OHFT	RAFTS							
Output 2.2 Rapid Response Mechanism (RRM) established and functioning									
Formulate contingency plans for specific species	OHFT	CnES, SEPA and SNH							
Identification of personnel for response teams	OHFT	CnES, SEPA and SNH							
Training of personnel to execute contingency plans	OHFT	CnES, SEPA and SNH							
Identification of funding resources	OHFT, RAFTS	CnES, AAG, HISF and SNH							
Refresher training	OHFT	SNH, RAFTS							
Establish local communications systems	OHFT	CnES, SEPA and SNH							
Monitor population(s)	OHFT	SNH, SEPA							
Output 2.3 Develop strategic monitoring of INNS within region									
Develop and agree protocols	SFCC	SEPA/SNH							
Produce database to manage INNS survey data	SFCC	SEPA SNH							
Training of Trust and other agency staff in monitoring methods	OHFT SEPA Highland Council	SFCC/RAFTS SEPA Highland Council							
Develop monitoring manual	SFCC	RAFTS, SEPA (National)							
Objective 3: Develop effective control and eradication programmes for existing INNS that pose significant threats to local riparian and aquatic biodiversity and the islands' economy									
Output 3.1 Effective sustainable control/eradication programmes within the Outer Hebrides region are established and fully functional									
Initiate and complete catchment wide surveys by trained personnel	OHFT								

ACTION	LEAD	PARTNERS	TIMEFRAME						
			2009	2010	2011	2012	2013	2014	2015
Establish GIS database for recording and mapping INNS within Outer Hebrides region	OHFT	RAFTS, SFCC, SEPA							
Continuation of mink eradication programme	SNH	CnES, OHFT, HIE, RSPB							
Implementation of phase 1 of control/ eradication programme	OHFT	Angling clubs, Landowners, SNH, SEPA[38]							
Implementation of habitat restoration scheme within successful control areas taking into account all relevant species	OHFT	Angling clubs, Landowners, SNH, SEPA[39]							
Monitor the effectiveness of control programmes	OHFT	SEPA							
Marine Scotland monitoring Red Vent Syndrome	MS								
Output 3.2 Outputs and proposed activities associated with the plan are reported to and discussed with the West Highland Area Advisory Group (WHAAG) and the Local Biodiversity Action Plan (LBAP) Steering Group									
Complete draft biosecurity plan	OHFT								
Consult with all stakeholders to agree biosecurity plan	OHFT	All							
Report to WHAAG and LBAP	OHFT	WHAAG & LBAP members							
Identify and develop opportunities for future funding of eradication projects	OHFT	Highland Invasive Species Forum SEPA AAG FC SNH							

[38] May be eligible for funding from the Restoration Fund
[39] May be eligible for funding from the Restoration Fund

6. Abbreviations used

General Terms:

INNS – Invasive Non Native Species
CBD – Convention on Biological Diversity
DEFRA – Department for Environment, Food and Rural Affairs
SAC – Special Area of Conservation
SPA – Special Protection Areas
SSSI – Sites of Special Scientific Interest
NBN – National Biodiversity Network
RET – Road Equivalent Tariff
RRM – Rapid Response Mechanism
GIS – Geographic Information System

Organisations:

OHFT – Outer Hebrides Fisheries Trust
WISFB – Western Isles Salmon Fisheries Board
RAFTS – Rivers And Fisheries Trusts of Scotland
SG – Scottish Government
NNSS – Non Native Species Secretariat
CnES – Comhairle nan Eilean Siar
SNH – Scottish Natural Heritage
SEPA – Scottish Environment Protection Agency
SFCC – Scottish Fisheries Coordination Centre
HIE – Highlands & Islands Enterprise
MS – Marine Scotland
RSPB – Royal Society for the Protection of Birds
SGRPID – Scottish Government Rural Payments and Inspectorate Division