Biosecurity Management Plan for the Wester Ross and Loch Alsh areas 2010 – 2015







Final Version 1 August 2010

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The Scottish Government

RIVERS & FISHERIES TRUSTS OF SCOTLAND
Safeguarding Scotland's Rivers & Lochs

The Highland Council
Comhairle na Gaidhealtachd

SCOTTISH NATURAL HERITAGE

Esmée Fairbairn FOUNDATION

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.

Where can find more background information about Invasive non-native species?

Please visit www.invasivespeciesscotland.org.uk

Acronyms

Acronym	
CBD	Convention on Biological Diversity
FCS	Forestry Commission Scotland
HC	The Highland Council
HBRC	Highland Biological Recoding Centre
ISF/HISF	Highland Invasive Species Forum
NNSS	Non-native Species Secretariat
NTS	National Trust for Scotland
RAFTS	Rivers and Fisheries Trusts Scotland
REFMG	River Ewe Fisheries Management Group
RSPB	Royal Society of the Protection of Birds
SAC	Special Area of Conservation
SEPA	Scottish Environment Protection Agency
SFCC	Scottish Fisheries Co-ordination Centre
SG	Scottish Government
SLEF	Skye and Lochalsh Environment Forum
SNH	Scottish Natural Heritage
SPA	Special Protected Area
SWT	Scottish Wildlife Trust
TFL	Trees For Life
TWG	Tripartite Working Group
WRASFB	Wester Ross Area Salmon Fishery Board
WREN	Wester Ross Environment Network
WRFT	Wester Ross Fisheries Trust

Contents

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Executive Summary

The Wester Ross & Lochalsh Biosecurity Management Plan will be 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 (RAFTS) with backing and support from the Scottish Government, Scottish Natural Heritage, Scottish Environment Protection Agency, and the Esmeé Fairbairn Foundation.

The vision of this plan is: 'To establish a sustainable framework that will lead to the prevention, detection, control and eradication of invasive non-native species within Wester Ross and adjacent areas. This will be undertaken through the application of appropriate management activities, data collection, liaison, education and legislation '. The plan focuses on species of concern to aquatic environments and fisheries.

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

- **Objective 1:** Prevent the introduction and spread of new invasive non-native species and fish diseases within the Wester Ross area;
- **Objective 2:** Establish optimum surveillance, detection, monitoring and rapid response systems for the identified invasive non-native species and fish diseases which pose significant threats to local biodiversity and economy;
- **Objective 3:** Effective control and eradication programmes for existing invasive non-native species and fish diseases are operational and sustainable.

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

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

The objectives of this plan will be implemented through agreed actions. The key actions and timetables are:

Objective 1 Prevent the introduction and spread of new invasive non-native species and fish diseases within the Wester Ross area

A. Establish programme to raise awareness with stakeholders
B. Encourage use of good practice within key stakeholder groups
C. Establish and extend disinfection programme to cover likely pathways of entry

Key: ▬ Solid line indicates continuous action ▪▪▪▪ Dotted line indicates ongoing / wide timescale effort

Action	Lead Partner	Partners	Timescale						
			2010	2011	2012	2013	2014	2015	2016
Launch of Wester Ross & Lochalsh Biosecurity plan through national and local press - create press release.	WRFT /ISF	All & RAFTS	▬						
Raise awareness of legislation: produce leaflet on legislation including waste management & planning regulations	Highland Council	SNH, AAG	▬	▬	▬	▬	▬	▬	▬
Raise awareness of biosecurity: produce leaflet on biosecurity risks and reporting systems	ISF / WRFT	AAG, SNH	▬	▬	▬	▬	▬	▬	▬
Establish disinfection facilities: expand facilities	DSFB / Marine Scotland	WRFT / landowners	▪▪▪▪	▪▪▪▪	▪▪▪▪	▪▪▪▪	▪▪▪▪	▪▪▪▪	▪▪▪▪
Develop interim code of practice with port authorities	Port Authority		▬	▬					
Engage retail outlets and clubs at open days and events such as agricultural shows	ISF / WRFT /	SNH	▪▪▪▪	▪▪▪▪	▪▪▪▪	▪▪▪▪	▪▪▪▪	▪▪▪▪	▪▪▪▪
Meeting with landowners and angling clubs to promote awareness with tenants, resource users, members and visitors.	WRFT / ISF	DSFB	▪▪▪▪	▪▪▪▪	▪▪▪▪	▪▪▪▪	▪▪▪▪	▪▪▪▪	▪▪▪▪
Engage environmental groups of schools & communities	WRFT /ISF		▪▪▪▪	▪▪▪▪	▪▪▪▪	▪▪▪▪	▪▪▪▪	▪▪▪▪	▪▪▪▪
Expand Classroom projects to include INNS	WRFT /ISF	RAFTS	▪▪▪▪	▪▪▪▪	▪▪▪▪	▪▪▪▪	▪▪▪▪	▪▪▪▪	▪▪▪▪

Objective 2 Establish optimum surveillance, detection, monitoring and rapid response systems for the identified invasive non-native species and fish diseases which pose significant threats to local biodiversity and economy:

A. Establish an 'early warning system' for detecting new threats

B. Develop rapid response protocols for new significant threats to local biodiversity and economy

Action	Lead Partner	Partners	Timescale						
			2010	2011	2012	2013	2014	2015	2016
A. Early Warning system									
Agree 'Early warning system' protocol	WRFT	ISF							
Train WRFT personnel in identification of INNS	WRFT	RAFTS, SNH, SEPA							
Train WRFT as INNS identification trainers	WRFT	RAFTS, SNH							
Work with stakeholder groups to identify and train 'eyes'	WRFT	ISF							
Develop reporting system for notification of INNS sightings	WSFT/ RAFTS	ISF, SEPA National							
Produce database to record and manage INNS sightings	RAFTS								
Monitoring of non-native fish & non native genotypes	WRFT	MS							
B Rapid response protocol									
Formulate contingency plans for 'High priority local' INNS	RAFTS,	ISF, SNH, SEPA							
Formulate contingency plans for key species	, RAFTS WRFT	Highland Council, SEPA and SNH							
Identification of personnel for response teams	WRFT,	Highland Council, SEPA and SNH							
Training of personnel to execute contingency plans	WRFT,	Highland Council, SEPA and SNH							
Refresher training	WRFT	RAFTS, SNH							
Monitor populations/treated areas	WRFT	SNH, SEPA							

Objective 3 Effective control and eradication programmes for existing invasive non-native species and fish diseases are operational and sustainable.

A. Collect data on distribution and abundance of existing threats;

B. Develop and initiate control and eradication programmes to tackle threats.

Action	Lead Partner	Partners	Timescale						
			2010	2011	2012	2013	2014	2015	2016
A. Collect data									
WRFT Habitat surveys to include INNS	WRFT	SFCC							
Conduct INNS surveys in priority areas R. Ewe-Loch Maree Catchment	WRFT	ISF							
Liaison between WRFT and ISF re. Current distribution and abundance of INNS within Wester Ross and nearby areas	WRFT	ISF							
Create INNS GIS data base	ISF	WRFT / RAFTS, SFCC, SEPA National							
B. Develop and initiate control and eradication programmes									
Identify and attain funding for programmes	ISF / WRFT								
Develop & Initiate a River Ewe-Loch Maree biosecurity programme	WRFT	Ewe FMG, SEPA[1]							
Continuation of American mink programme	RAFTS/	WRFT/ISF SNH							
Continuation of existing Japanese knotweed programmes	SCLEF / ISF/ Landowners	SEPA[2]							
Extension of existing Japanese knotweed programmes to eradicate it from Wester Ross & Lochalsh	ISF	SEPA[3]							
Continuation and extension of existing Rhododendron programmes	NTS/ ISF/FCS Landowners								
Development of Himalayan balsam eradication programme	ISF	SEPA[4]							
Monitor and evaluate efficacy and control and eradication programmes	WRFT/ ISF	SNH, SEPA							
Identify and develop opportunities for future funding of eradication projects	WRFT	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

[3] May be eligible for funding from the Restoration Fund

[4] May be eligible for funding from the Restoration Fund

Part 1 Purpose and Scope of Biosecurity Plan

This plan describes the biosecurity issues of the county of Wester Ross and adjacent parts of the Lochalsh – Loch Hourn area. The area of coverage is shown in Figure 1. Priority actions are proposed for the prevention, early detection, control and mitigation of the introduction and spread of selected invasive non-native species (INNS) and fish diseases.

Although preparation of the plan has been initiated from a freshwater fisheries management perspective, it is recognised that a co-ordinated, all-inclusive approach to invasive-non-native species is vital to achieve success in eradicating and sustaining control of problem species.

The vision of this plan is therefore:

'To establish a sustainable framework which will lead to the prevention, detection, control and eradication of invasive non-native species within the Wester Ross area through the application of appropriate management, data collection, liaison, education and legislation"

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

- **Objective 1:** Prevent the introduction and spread of new invasive non-native species and fish diseases within the Wester Ross area.
- **Objective 2:** Establish optimum surveillance, detection, monitoring and rapid response systems for the identified invasive non-native species and fish diseases which pose significant threats to local biodiversity and economy.
- **Objective 3:** Effective control and eradication programmes for existing invasive non-native species and fish diseases are operational and sustainable.

These objectives are in accordance with established protocols for fish diseases and with the three key elements of the **Invasive Non Native Species Framework Strategy**[5]**:**

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

The aims and 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 and strengthening of local awareness, capacity and partnerships to ensure the success and long-term sustainability of the presented actions.

[5] http://www.nonnativespecies.org/documents/Invasive NNS_Framework_Strategy_GB_E.pdf

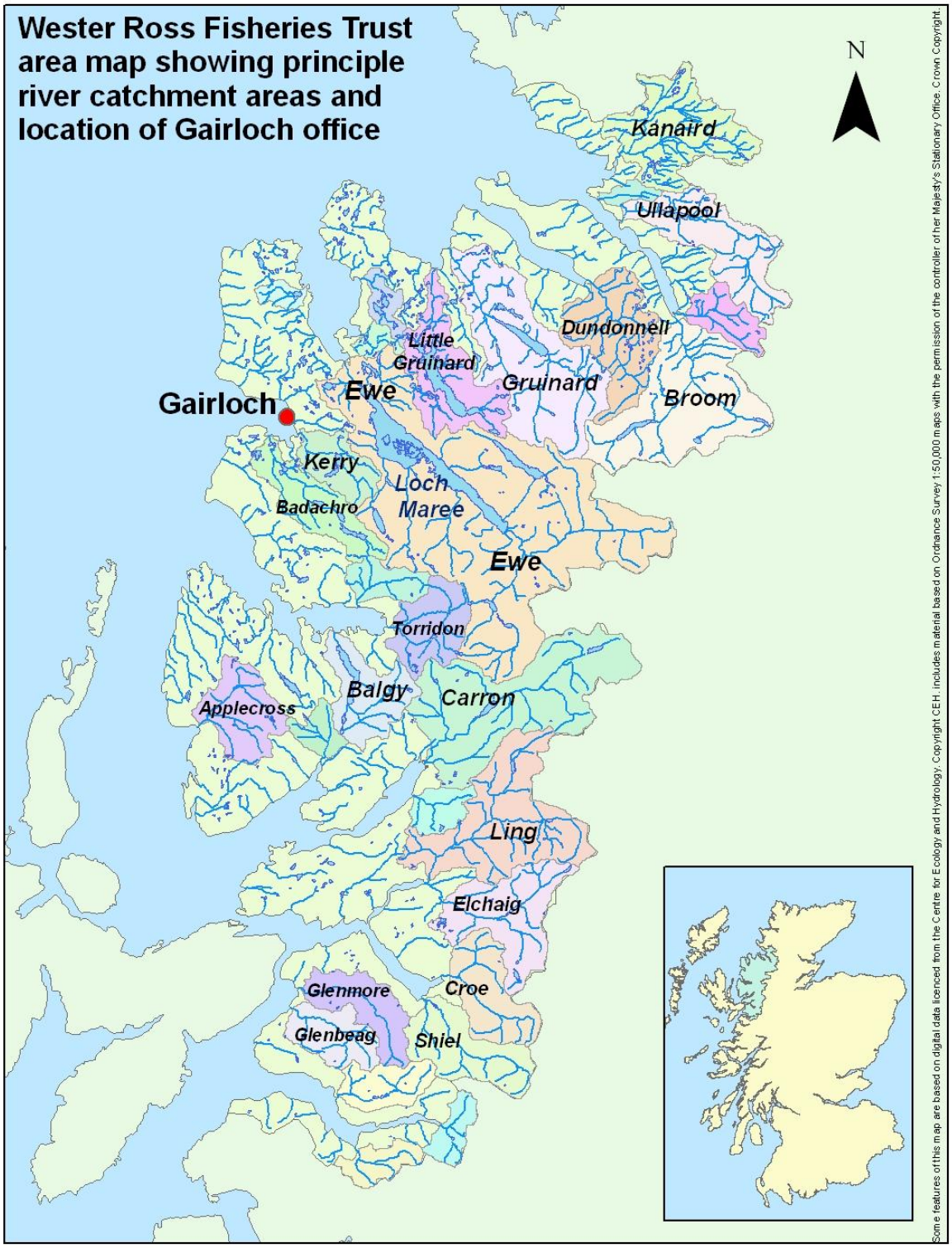
Progress towards the eradication of invasive non-native species from specific areas will be made most efficiently (in terms of resources and time) where all stakeholders are able to collaborate and combine their efforts in a co-ordinated way.

The implementation of this plan will bring many broad benefits to the area:

- Conservation and enhancement of biodiversity.
- The restoration and improvement of riverine habitats for a wide range of flora and fauna.
- The increased contribution of fisheries, farming, forestry, sporting estates and beekeeping, to the local economy.
- Maintenance of ecosystem services.
- The protection of native-genotypes of fish and other wildlife.

Wireweed (*Sargassum muticum*) *has been recorded in the sea off southern Skye and may already be present within the Lochalsh area.*

Figure 1. Map of the area covered by this Biosecurity plan showing major river catchments and the location of the WRFT office



Part 2 Introduction

Prepared by the Wester Ross Fisheries Trust (WRFT)[6] this draft 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[7] with backing and support from the Scottish Government[8], Scottish Natural Heritage[9] (SNH), Scottish Environment Protection Agency[10] (SEPA) and the Esmeé Fairburn Foundation[11].

The WRFT is a registered Scottish charity, the purpose of which is to maximise and sustain the productivity of wild salmonid fisheries in the rivers and lochs of Wester Ross. The main objectives of WRFT are:

- Conservation of wild salmonid populations.
- Restoration of sea trout production in the River Ewe – Loch Maree system.
- Restoration of salmon and sea trout production in areas where there is potential to support larger wild populations.

The Trust also carries out a range of project work on Brown Trout, Arctic Charr and other fish species and the habitats in which they live. Outreach to people – the engagement and participation of diverse stakeholders, including members of the public, school children, government and non-government organisations is therefore an over-arching core activity of the WRFT programme.

The WRFT considers the preparation and implementation of this biosecurity management plan as an essential component in the protection and enhancement of the environment, which will help to conserve biodiversity in the area and, ultimately, improve conditions for wild fish and the ecosystems which support them.

The need for action on biosecurity issues has been identified in the Wester Ross Fisheries Trust's Fisheries Management Plan[12], the Wester Ross Local Biodiversity Action Plan[13], and the draft West Highland River Basin Management Plan[14]. This biosecurity plan is a platform for local action to address those biosecurity issues. The final plan will have 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.

[6] http://www.wrft.org.uk/
[7] http://www.rafts.org.uk/home/home.asp
[8] http://www.scotland.gov.uk/Home
[9] http://www.snh.org.uk/
[10] http://www.sepa.org.uk/default.aspx
[11] http://www.esmeefairbairn.org.uk/
[12] http://www.wrft.org.uk/news/newsitem.cfm?id=65
[13] http://www.highlandbiodiversity.com/htm/counties/wester_ross/wester_ross.php
[14] http://www.sepa.org.uk/water/river_basin_planning.asp

The final plan is to be produced using a participatory planning process coordinated by the Wester Ross Fisheries Trust through which stakeholders are asked to agree the aims, outputs and actions presented in this draft plan. The plan aims to strengthen partnerships of differing groups of stakeholders to implement the actions required to address the complex issues associated with biosecurity. This draft plan therefore represents an approach of the Wester Ross Fisheries Trust and Rivers and Fisheries Trusts Scotland, to be agreed with other stakeholders and appropriate regulatory agencies in the Wester Ross and Lochalsh area, 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 Wester Ross, this plan will also facilitate coordination and communication with the neighbouring fisheries Trusts, Boards, local authorities and other stakeholders of neighbouring areas e.g. West Sutherland, Lochaber, and Cromarty Firth.

Alder seedlings competing with R. ponticum and spruce seedlings by the River Carron near Achnashellach. The Forestry Commission presented ambitious plans for establishing native woodland from the floodplain to the hill sides. Stands of mature Caledonian (Scots) pine remain. However, unless a catchment-based approach to R. ponticum control is instigated and bushes in upstream areas are eradicated, it is hard to see how 'native' woodland establishment could be achieved.

Part 3 **Context**

3.1 Biosecurity: The Nature of the Problem

Invasive Species, Biosecurity and You

Invasive non-native species (INNS) and fish diseases damage our environment, the economy, our health and the way we live. They already cost the Scottish economy and therefore us upwards of £500 million per year and the UK economy £2-£6 billion per year. The expansion of world trade and the tourism market to include more destinations coupled with the impacts of climate change have led to the increased introduction, establishment and spread of INNS and fish 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 INNS and fish diseases.

If nothing is done, the costs to our environment, economy and health will only increase. There is a need to increase awareness and understanding of Invasive Non Native Species and Biosecurity issues and impacts and what can be done about them.

What are Invasive Non Native Species?

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.

Non native species have long been introduced and used as ornamental plants or pets, and only a small minority of them are or will become invasive (SNH, 2000)[15]. Invasive non-native species (INNS) are not just of concern to salmon and sea trout fisheries. According to CBD (2006)[16], 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; hence fisheries trust interest and concerns. 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 INNS 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:

[15] http://www.snh.org.uk/pdfs/publications/review/139.pdf
[16] http://www.cbd.int/

- DEFRA[17] 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 report of the Review of Non-Native Species Policy (2003)[18] has estimated the total cost of its removal using current techniques at £1.56bn.
- A Scottish Government report[19] estimated the potential Net Economic Value loss to Scotland of the introduction of *Gyrodactylus salaris* at £633 million with severe consequences for rural communities.
- 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[20].
- 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. In Wester Ross, the pike (*Esox luscious*) and minnow are regarded as translocated species and may have altered fish communities in the lochs they now inhabit.

What is Biosecurity?

Scotland's Environment and Rural Services (SEARS) in their Biosecurity Guidance[21] states that "Good biosecurity practice refers to a way of working that minimises the risk of contamination and the spread of animals and plant pests and diseases, parasites and non-native species".

The Need for Action

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**[22] that significantly impact freshwater fisheries and the aquatic environment. This local plan and its implementation is also a part of a strategic and coordinated approach to INNS management being undertaken across Scotland by RAFTS members.

[17] http://www.defra.gov.uk/wildlife-countryside/wildlife-manage/non-native/index.htm
[18] http://www.defra.gov.uk/wildlife-countryside/pdf/wildlife-manage/non-native/review-report.pdf
[19] www.scotland.gov.uk/resource/doc/1062/0042434.pdf
[20] http://www.forestresearch.gov.uk/pdf/Argyll_Bute_rhododendron_2008_costs.pdf/$FILE/Argyll_Bute_rhododendron_2008_costs.pdf
[21] http://www.sears.scotland.gov.uk/DocumentView.aspx?id=28
[22] http://www.invasivespeciesscotland.org.uk/biosecurity_programme/invasive_non_native_species.asp

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 species *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 Wester Ross area. These approaches are consistent with the GB Invasive Non Native Species Framework Strategy[23] and the Species Action Framework[24] both of which have been approved 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 INNS, fish diseases and parasites:

- Section 14 of The Wildlife and Countryside Act (1981)[25] makes it an offence to allow any animal (including hybrids) which is not ordinarily resident in Great Britain, to escape into the wild; or release it into the wild; or to release or to allow to escape from captivity, any animals that is listed on Schedule 9 of the 1981 Act. It is also an offence to plant or otherwise cause to grow in the wild any plant listed on schedule 9 of the 1981 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.

- Section 179 of the Town and Country Planning (Scotland) Act 1997[26] 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 Possession of Pesticides (Scotland) Order 2005[27] regulates the use of pesticides and herbicides for the control and eradication of INNS.

- Environmental Protection Act 1990[28] contains a number of legal provisions concerning "controlled waste", which are set out in Part II. Any Japanese knotweed or giant hogweed contaminated soil or plant material discarded is likely to be classified as controlled waste. This means that offences exist with the deposit, treating, keeping or disposing of controlled waste without a licence.

- The Waste Management Licensing Regulations 1994[29] define the licensing requirements which include "waste relevant objectives". These require that waste is recovered or

[23] www.nonnativespecies.org
[24] www.sng.org.uk/speciesactionframework
[25] www.opsi.gov.uk/RevisedStatutes/Acts/ukpga/1981/cukpga_19810069_en_1
[26] www.opsi.gov.uk/acts/acts1997/ukpga_19970008_en_1
[27] www.opsi.gov.uk/legislation/scotland/ssi2005/20050066.htm
[28] www.opsi.gov.uk/acts/acts1990/ukpga_19900043_en_1
[29] http://www.opsi.gov.uk/si/si1994/uksi_19941056_en_1.htm

disposed of "without endangering human health and without using processes or methods which could harm the environment".

- Controlled Waste (Registration of Carriers and Seizure of Vehicles) Regulations 1991[30] and the Environmental Protection (Duty of Care) Regulations 1991[31] provide guidance for the handling and transfer of controlled waste.
- The Aquaculture & Fisheries (Scotland) Act 2007[32] that regulates against the unauthorised introduction of fish to inland waters.
- The Prohibition of Keeping or Release of Live Fish (Specified Species) Order 2003[33] requires that a licence be obtained for the keeping or release of species listed on Schedules 1 and 2.
- The NetRegs[34] website contains useful guidance on INNS and their control

The procedures for the detection, notification and control of fish diseases are already well defined by the fisheries legislation. This stipulates that Marine Scotland acts on behalf of the Government with 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 links Government led policy, legislation and strategic action with local actions and reflects, implements and/or supports the provisions and requirements of the following existing plans (Table 1):

Table 1. Identified Actions in the Wester Ross and Lochalsh area Biosecurity Plan supporting provisions or requirements of other relevant plans

Provision or Requirement of Existing Plan	Action in This Biosecurity Plan
Wester Ross Local Biodiversity Action Plan **Skye and Lochalsh Biodiversity Action Plan**	These plans address the issues associated with the effect of INNS on many native species within respective areas and support and enhance the aims of the Wester Ross Environment Network (WREN), Skye and Lochalsh Environment Forum (SKEF) and the Highland Invasive Species Forum (HISF)
Conservation objectives of **Special Areas of Conservation and Special Protection Areas (SACs and SPAs**) and targets for **Sites of Special Scientific** Interest (**SSSIs**). Scotland's Biodiversity: A strategy for the conservation and enhancement of biodiversity in Scotland.	This plan will support the conservation objectives and designated conservation areas in the Wester Ross area.

[30] www.opsi.gov.uk/si/si1991/Uksi_19911624_en_1.htm
[31] www.opsi.gov.uk/si/si1991/uksi_19912839_en_1.htm
[32] http://www.opsi.gov.uk/legislation/scotland/acts2007/asp_20070012_en_1
[33] http://www.scotland.gov.uk/resource/doc/47133/0009766.pdf
[34] http://www.netregs.gov.uk/netregs/default.aspx

Provision or Requirement of Existing Plan	Action in This Biosecurity Plan
The RBMP for Scotland and the **West Highland River Basin Management Plan (RBMPs).** **Provision:** • identification of appropriate actions to manage species that threaten high and good status sites, together with identification of potential sources of re-infestation in the surrounding area; • establishment of detection /surveillance /control strategies for problem species; • risk assessment of pathways for entry of problem species into the Scotland river basin district; • research and development to define species causing deterioration of good ecological status/ potential and to identify new methods of control; and • development of biosecurity plans to prevent movement of species between catchments and respond quickly to new infestations	RBMPs are likely to provide a framework and cross-sector approach to biosecurity planning through Area Advisory Groups (AAGs). This plan will assist and facilitate a coordinated and widespread response to biosecurity issues: • Raising awareness of biosecurity issues • Act as a conduit for national initiatives into the local management sphere • Develop catchment-based approach to control and eradication • Ensure control methods do not impact on the water environment
The Wester Ross Fisheries Trust Fisheries Management Plan 2009+ aims to prescribe activities identified as being beneficial to the performance of fisheries and that promote biodiversity while delivering economic benefit to the wider community. It includes proposals for additional riparian habitat surveys and builds on earlier river-specific WRFT fishery management plans including that of the rivers Ullapool, Broom and Carron where the control of non-native species, particularly *R. ponticum*, was identified as a concern for priority actions.	This biosecurity plan has been formulated as part of the implementation of the Wester Ross Fisheries Management Plan and addresses the specific elements of: • Raising awareness of biosecurity issues • Implementing effective mechanisms to prevent introduction of *Gyrodactylus salaris* • Assisting government agencies to monitor presence of diseases and parasites • Developing and supporting plans for control and eradication of alien flora and fauna • Working with fish farmers to prevent escapes of farmed fish • Prevention/detection/rapid response INNS
***Gyrodactylus salaris* (Gs) Contingency Plan** A 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 response protocols.
Highland Invasive Species Forum (HISF) Strategy	This plan will support the HISF strategy which prioritises five species for action: *Rhododendron ponticum,* Japanese knotweed, Giant Hogweed, Himalayan balsam, and North American Mink.

Part 4 Scope of the Plan

4.1 The Natural Resources of Wester Ross and adjacent areas

The river systems of Wester Ross and the Lochalsh area drain some of the most spectacularly rugged mountainous terrain within the British Isles. The area is rocky, peaty (especially between 10m and 500m altitude), and has relatively small areas of fertile soil in the river valleys. Scotland's largest 'National Scenic Area' [NSA] is the Wester Ross NSA, with an area of 145,300Ha.

Wester Ross has a wide range of terrestrial, freshwater, coastal and marine habitats. These habitats support a wide range of biota of both economic and biodiversity conservation importance .The Local Biodiversity Action Plans [35] and a series of Biodiversity Posters[36] both produced by local biodiversity action groups provide further information.

Terrestrial resources

Land coverage in the Wester Ross area currently consists of a complex mosaic of mountains, moorland, peatland, forests and improved or semi-improved farm grassland. Soils are thin, eroded or poorly developed over much of the area, especially the higher ground. Peaty gleys, peat and peaty podsols predominate.

The ecology, fertility and productivity of terrestrial habitats within the area have been heavily influenced by human intervention. Keystone species that have a major influence on floral composition and woodland cover currently include red deer, sheep and cattle.

Freshwater resources

There are over 25 river systems within the area with juvenile salmon populations. Lochs that are accessible to salmon and / or sea trout are present within the following river systems: Ullapool, Gruinard, Little Gruinard, Tournaig, Ewe, Sguod, Badachro, Torridon, Balgy, Shieldaig, Carron, Elchaig and Shiel. The largest freshwater loch is Loch Maree. Several smaller systems also have lochs that are accessible to sea trout. However, there are many more lochs that are inaccessible to salmon and sea trout above waterfalls. These include Loch a' Bhraoin (River Broom catchment area), Lochan Fada (River Ewe catchment area), Loch a Bheallach (Badachro River), Loch Lundie (Inverbain River), and hundreds of smaller waters. Species of conservation importance include Freshwater pearl mussel, Otter, Atlantic salmon, Brown Trout (including sea trout) and Arctic Charr.

Marine and coastal habitats

The convoluted nature of the coastline supports a wide diversity of coastal and marine habitats, including internationally important Flameshell reefs, Eel grass beds and Maerl beds. A variety of

[35] http://www.highlandbiodiversity.com/htm/counties/local_biodiversity_action_plans.php
[36] http://www.highlandbiodiversity.com/htm/local_biodiv_groups/wr/posters/wr_posters.php

other marine habitats are associated with sheltered sea lochs or more exposed headlands. Important species include many commercial shellfish and finfish, Common Skate (IUCN Critically Endangered), Porpoise, Grey Seal and Harbour Seal, and a variety of birds and other animals.

4.2 Use of Land and Water Resources

Due to the rugged landscape of Wester Ross, there is a limited range of land use practices within the region that provide economic benefits to the local economy. Levels of biological productivity, like those of 'rainforest' areas elsewhere in the world, are limited by nutrient availability. Heavy rainfall leaches soils of nutrients. Nutrient retention and recycling, crucially that of phosphorus [P], are dependent upon a healthy ecosystem. The productivity of streams and lochs is heavily influenced by land management practices.

4.2.1 Land resources

Wester Ross has a mix of land uses including deer stalking, forestry, agriculture, natural woodland and urban development. Tourism is a major over-riding economic activity: visitors are attracted by deer stalking, fishing and increasingly by opportunities for walking, water sports and wildlife encounters in spectacular semi-natural landscapes.

Deer stalking

Red deer populations are present in all upland areas, and many estates are managed with deer stalking (and associated tourism) as the principle economic land use activity. Some areas are subject to periodic moorburn of heather aimed at improving grazing for red deer.

Agriculture

Rough pasture for upland livestock farming is the most significant form of agriculture due to the relatively low production of large areas of land. Much of the livestock is on the 'Common Grazing' areas of crofting townships, where red deer also graze. Stocking densities are significantly lower in the uplands compared to the more productive lower lying areas of improved or semi-improved grassland. There is relatively little arable farming undertaken in the area.

Forestry

Commercial forestry is a significant land use in the Wester Ross and Lochalsh area and is managed by both public (Forestry Commission) and private sectors. Forestry interests now have a mix of objectives including commercial, recreational and conservation and therefore have a significant role in biosecurity, particularly in the control of non-native invasive plants. A number of forests have significant *Rhododendron* infestation (e.g. Achnashellach, Inverlael). Over the past 10 years, several large native woodland restoration projects have been initiated, including the Baile Mor woodland on Gairloch Estate, Scotland's largest 'Woodland Grant Scheme'. The community woodland at

Laide[37] provides a wide range of hands-on opportunities for community participation in management and related activities. The Applecross Trust[38] provides similar opportunities, working in partnership with the local community to improve woodlands and other semi-natural habitats.

Natural woodland

There are several important areas of native broadleaf and semi-natural woodland. These include Oak woods (e.g. Letterewe Estate), Ash woods (e.g. Raasal Wood NNR), Scots pine woodland (e.g. Beinn Eighe NNR). These types of woodland are highly valuable from a biodiversity perspective as they can support a comprehensive array of native flora and fauna. Some of these woodlands have been given extra protection due to their international importance in terms of species diversity. INNS such as *Rhododendron ponticum* are a major threat to these woodlands.

Urban development

Larger conurbations include Ullapool, Gairloch, Lochcarron, Plockton and Kyle of Lochalsh. While covering relatively small areas of land, the concentration of human activities such as gardening provides significant potential for the translocation of invasive non native plants.

4.2.2 Water resources

Wester Ross has significant water resources which are of international importance for wildlife. They are utilised for fisheries, aquaculture, hydroelectric generation and domestic water supply, and provide sheltered harbours for boats from outwith the area.

Wildlife conservation and tourism

Under the EU Species and Frameworks Directive[39], Special Areas for Conservation (SACs) of the Atlantic salmon, Otter and Freshwater pearl mussel, and Special Protected Area (SPAs) for Black-throated diver have been designated within the area. Inshore waters are of outstanding interest for marine wildlife; wildlife tourism businesses based in Ullapool, Gairloch, Shieldaig, Plockton and Kyle of Lochalsh provide opportunities for visitors to see Grey and Common seals, Porpoises, Minke whale, Basking shark, many birds and an amazing diversity of underwater wildlife. Tourism is the major economic activity of the area, and is increasingly based on healthy and productive wildlife habitats. To date, few INNS have spread within freshwater and marine habitats within the area, though several species pose a threat for the future.

Fisheries

There are significant fisheries for native species including migratory Atlantic salmon (*Salmo salar*) and sea-trout [sea-going brown trout (*Salmo trutta*)] that utilise both marine and freshwater habitats. Atlantic Salmon are a priority species supporting sport fisheries. Sea-trout were formerly as

[37] http://www.laidewood.org.uk/
[38] http://www.applecrosstrust.org.uk/index.html
[39] http://www.snh.org.uk/about/directives/ab-dir07.asp

important though sea-trout fisheries (including the Loch Maree sea trout fishery) have yet to fully recover after collapsing in the 1990s. There are also many fisheries for brown trout in the numerous lochs in the region. Although Wester Ross is a stronghold for Arctic charr (*Salvelinus alpinus*) in the UK, this species is seldom fished for. Two loch systems support fisheries for pike (*Esox lucius*) which were introduced during the 19th Century.

Angling activity is assumed to have led to the spread of the common minnow (*Phoxinus phoxinus*) into a number of freshwater catchments in the region, most recently recorded for the first time in the Little Gruinard (Atlantic salmon SAC) catchment in 2009.

Aquaculture

This is a major economic significant activity in both marine and freshwaters, primarily cage and tank-based culture of Atlantic salmon, and shellfish culture in sea lochs.

Several salmon farming companies are currently involved in Area Management Agreements (AMAs) with wild fish interests and Scottish Government through the Tripartite Working Group. This initiative has focused on addressing fish health issues of both wild and farmed fish. AMAs have been signed for the Loch Ewe, Loch Torridon, Lochcarron – Kishorn; and Loch Alsh-Duich-Hourn areas. In these areas, Area Management Group (AMG) meetings are held two or three times per year. Aquaculture is particularly vulnerable to the impact of INNS such as *Didemnum vexillum* that can foul cages and other hard substrates and fish diseases such as Gyrodactylosus and Infectious Salmon Anaemia.

Hydroelectric generation schemes

There are an increasing number of hydroelectric generation schemes within the region. The establishment of INNS such as zebra mussels could have a major impact on the hydroelectric industry through colonisation of pipes and intakes. Clean up costs in the USA run into tens of millions of dollars. Two older schemes transfer water from the River Ewe headwaters and River Broom headwaters into the River Conon catchment. The inter connections between schemes have implications for the translocation of biosecurity threats, such as fish diseases and parasites from one catchment into other connected catchments

Water supply

Scottish Water provide a supply of drinking water to domestic settlements from many river systems, including the Broom, the Allt Beith (Aultbea river), Naast burn, Ewe (Allt a' Chuirn), Strath burn (Allt a' Mhullinn) and Duirinsh Burn. Again zebra mussels are a major threat to this industry (see hydroelectric generation).

Harbours and ports

The main harbours and piers are at Ullapool, Aultbea, Gairloch, Shieldaig, Kishorn, Plockton and Kyle of Lochalsh. Of these, Ullapool Harbour is the busiest with ferry service to Stornoway, and cargo vessels, passenger ships and fishing boats from foreign waters visiting the harbour. The Ullapool

Harbour Trust[40] manages the port. Inshore fishing boats and recreational boats operate from many other smaller jetties and moorings in the area.

4.3 Biosecurity: Current and Potential Threats

4.3.1 Threats from INNS which already occur in the Wester Ross and Lochalsh areas

The invasive non-native species of main concern to aquatic environments which are known to occur within the Wester Ross – Lochalsh area are presented in Table 2.

Table 2 Threats from INNS which already occur in the Wester Ross - Lochalsh area

Species	Impact	Risk of continued spread
Rhododendron *(Rhododendron ponticum & hybrids)*	**High** Out-competes native plants for space and resources, especially sunlight with impacts on fish and invertebrate communities as well as preventing site access.	**High** Spreads by natural seed and vegetative dispersal after intentional planting in gardens, parks and other land. Significant problems exist around almost every sea loch and river system within the area . . .
Japanese knotweed *(Fallopia japonica)*	**High** forms dense thickets excluding native plants and prohibiting regeneration and access, reducing biodiversity and altering the habitat for wildlife.	**High** Spreads along rivers and the coast by movement of plant fragments by water. It is found in many other areas through the movement of plant debris in soil and on vehicles. It can There are significant problems along the River Broom and in the Lochalsh area . . .
Himalayan balsam (*Impatiens glandulifera*)	**High** Has invaded river banks elsewhere in Scotland – usually where soils are more fertile than in Wester Ross.	**High** Can spreads rapidly through seed dispersal especially along watercourses.
American Mink *(Mustela vison)*	**High** Kills water fowl, small mammals and juvenile salmon and trout. Within the area covered by this plan, reports suggest that the biggest problems are in the Lochalsh - Loch Carron areas, where breeding tern colonies were devastated[41].	**High** Spread by migration. In some areas mink may be partly repelled by Pine marten. A collaborative SHN, SWT, RAFTS Mink control programme is underway in the Ullapool – Dornoch Firth area with support from landowners and estates[42].
N. American pondweeds *(Elodea spp.)*	**High** Can out-compete native aquatic plant species.	**High** Not yet recorded but probably in area. Introduced into garden ponds from water centres or other ponds.
Minnow (*Phoxinus phoxinus*)	**Medium** Can out-compete juvenile trout in lochs, and known to eat charr eggs.	**High** Has spread rapidly over the past 10 years and now present in nearly all major lochs. Introductions by anglers using livebait now illegal; it's possible that it can also spread by natural means.

[40] http://www.ullapool-harbour.co.uk/client/homePage.jsp
[41] Roger Cottis *pers comm* 2009
[42] http://www.wrft.org.uk/news/newsitem.cfm?id=98

Species	Impact	Risk of continued spread
Pike (*Esox lucius*)	**High** Feeds on other fish, including smaller trout and salmon and water birds, including juvenile ducks and divers.	**High** Only two river systems known to support pike at present. Main risk of further spread associated with transfer into new waters.
New Zealand Flatworm (*Arthurdendyus triangulates*)	**High** Can decimate earthworm populations, with knock on effects for birds, moles, badgers and fish. Soils then become compacted and water-logged with consequences for agricultural production.	**High** Spread in soil of pot plants as eggs or worms. It is present in many parts of Wester Ross including many gardens and croftland, except where you still see molehills . . .

4.3.2 Potential Threats from INNS not yet recorded in the area

Potential threats of introduction of INNS into the Wester Ross & Lochalsh area come from those species that are not currently found in Scotland but are present in neighbouring countries and could have access through one or more pathways to Scotland, and those species that are already present in Scotland but not yet in Wester Ross. There are a number of INNS that are not known to be present in Wester Ross area, but their current distribution indicates that they may soon become a threat.

Two levels of threat have been defined depending on the impact each of the new species pose to the local economy and biodiversity, in combination with the risk of their introduction:

- **High:** Species with Severe consequences for local biodiversity and economy with a Medium to High risk of introduction.

- **Medium:** Species with Moderate consequences for local biodiversity and economy with a Low to High risk of introduction.

INNS that pose a high threat to Wester Ross and Lochalsh are presented in Table 3a and medium threat INNS are presented in Table 3b.

Table 3a INNS posing a high threat to Wester Ross and Lochalsh.

Species	Risk of Introduction	Impact
Wireweed (*Sargassum muticum*)	**High** Already present in the West of Scotland to the south of the isle of Skye	Can out-compete native sea weeds and choke structures. Possible impact on aquaculture
Australian swamp stonecrop (*Crassula helmsii*)	**High** Not yet recorded but possibly in area. Introduced into garden ponds from water centres or other ponds.	Can out-compete native aquatic plant species.
Zebra mussel (*Dreissena polymorpha*)	**High** Already present in Ireland. Possible introduction through boat hulls and bilge waters.	Can choke pipes and add significant cleaning costs to hydro and water supply industries as well as affecting spawning areas.

Species	Risk of Introduction	Impact
North American signal crayfish (*Pacifasticus leniusculus*)	**High** Already present in the River Nairn. Spreads through deliberate introduction or in contaminated water with fish or water plant transfer.	Devastating impact on juvenile fish populations and aquatic invertebrates and habitats.
***Didemnum* Tunicates** (Sea Squirts)	**High** Present in Ireland and Wales, can be transferred by boat hulls.	Overgrows seaweeds, and shellfish beds, fouls underwater structures. Would have significant impact on aquaculture
Gyrodactylus salaris	**Medium – High** Not present in UK; a major awareness raising programme has been launched to ensure it never gets here.	Would lead to collapse of wild salmon populations.
Perch (*Perca fluviatilis*) [included here because of high risk of introduction!]	**High** Present in watersheds that flow to the east, including the Conon system and lochs.	Will have impact on juvenile fish populations, perhaps especially in sea trout systems.
Ruffe (*Gymnocephalus cernuus*)	**Medium** Present in Loch Lomond and could be introduced as discarded live bait, this is now illegal.	Will have impact on juvenile fish populations, perhaps especially in sea trout systems.
Asian topmouth gudgeon *(Pseudorasbora parva)*	**Medium** Currently only recorded from 5 locations in England but could be introduced as live bait, in contaminated water for aquaculture trade.	Severely impacts other aquatic species.
Chinese mitten crab *(Eriocher sinensis)* Resides in freshwater but migrates to the sea for breeding.	**Low** Present in NE England. Possibility of unintentional introduction from boat hulls and intentional introduction for live food trade.	Burrows damages river banks and native species.

Table 3b INNS consider to pose a medium or low threat to Wester Ross and Lochalsh.

Species	Risk of Introduction	
Slipper limpet *(Crepidula fornicate)*	**Medium**	Through unintentional introduction, hull fouling and contaminated oyster spat.
Water primrose *(Ludwigia grandiflora)*	**Medium**	Unintentional introduction from boat hulls and from sales from pond and garden trade.
Stone loach (*Barbatula barbatula*)	**Medium –**	Stone loach have been introduced to the neighbouring Kyle of Sutherland district probably by visiting Trout anglers. High densities of loach sampled alongside juvenile salmonids in the Awe catchment indicate that they compete for limited resources with native fish.
Roach (*Rutilus rutilus*	**Medium.**	One of several species of cyprinid that may be introduced into the area, spreading elsewhere in Scotland (e.g. Argyll) Concern that they may compete with vulnerable native species such as charr.
Water fern *(Azolla filiculoides)*	**Low**	Through intentional/ unintentional introduction from numerous locations throughout Scotland, especially central belt.
Bullhead *(Cotus gobio)*	**Low**	Translocated species recorded in central Scotland that could be introduced deliberately or as live bait.

Species	Risk of Introduction	
Curly waterweed *(Lagarosiphon major)*	**Low**	Present in southern and central Scotland and spreads by fragmentation via wind dispersal, boat movement, angling equipment and, possibly waterfowl. Also sold in Garden Centres and aquarium trade.
Parrot's feather *(Myriophyllum aquaticum)*	**Low**	Through intentional/ unintentional introduction from two existing populations in the south of Scotland.
Common cord grass *(Spartina anglica)*	**Low**.	One location near St Andrews
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.

4.3.3 Fish Health and genetic issues

There are a number of diseases and parasites that have potential to cause catastrophic 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 as the potential biological and ecological impacts 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 depending on their potential impact on the Scottish aquaculture industry and wild fish stocks[43].

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

- Infectious Salmon Anaemia (ISA)

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

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

List III diseases are those for which individual Member States 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)

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

- *Gyrodactylus salaris* (Gs)
- Enteric 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.

One non notifiable fish disease whose occurrence should be noted and reported to your local Trust is Red Vent Syndrome (RVS).

Non-native genotypes

Fishery and aquaculture activities utilise non-native genotypes of Atlantic salmon, brown trout and the non-native species rainbow trout for angling amenity and production of fish for the table market. It is now well understood that as well as being a potential vector for disease, stocking of fish from non-native sources can undermine the short and long-term productivity of fisheries. Breeding and competitive interaction between native and introduced fish is likely to produce offspring that have reduced survival and lower reproductive success[44]. Preventing release on non-native genotypes likely to interact with wild populations is essential to avoid biosecurity issues and short and long term biological (genetic) and ecological (competition) impacts on wild fish populations.

4.3.4 INNS and Fish Diseases Pathways

From Tables 2 and 3 and section 4.3.3, the main pathways or means of introduction of both high and medium level threat species into the Wester Ross and Lochalsh area catchments 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 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 canoeists)
- Contaminated angling equipment
- Movement of contaminated soils or vehicles
- Improper control and disposal measures e.g. cutting and dumping without treatment.

[44] 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)

To prevent the spread of these INNS and diseases these pathways need to be restricted. Where possible and feasible existing populations must be controlled or eradicated and their impacts mitigated.

Scotland's freshwater fish are protected by legislation including the Diseases of Fish Acts 1937 and 1983. These Acts make it a legal requirement to notify the Ministers of the suspicion of the presence of certain diseases in all species of fish. These are known as NOTIFIABLE DISEASES. It is an offence not to report incidences of these fish diseases. In Scotland the Fisheries Research Services (FRS) act on behalf of the Scottish Ministers and if you suspect the presence of a Notifiable Disease or if you require more information please contact the Fish Health Inspectorate by telephone on 01224 295525 or by email: FishHealth@marlab.ac.uk .

The information presented here was sourced from the Fisheries Research Services (FRS) and Centre for Environment Fisheries and Aquaculture Science websites via the RAFTS Invasive species website[45]. Further information on notifiable fish diseases is available through these website and leaflets produced by the FRS and CEFAS.

4.4 The Stakeholders

It will be important to ensure that the actions recommended are well informed and the progress of the plan assessed and adapted accordingly. Steerage and effective implementation of the plan will require a wider ownership and participation by interested parties.

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:

Policy & legislation

- Scottish Government, Edinburgh
- Scottish Natural Heritage, Portree, Kinlochewe, Ullapool, Golspie, Inverness
- Scottish Environment Protection Agency, Dingwall
- Marine Scotland

Land resources

- Forestry Commission, Inverness
- Crofting Foundation
- National Farmers Union
- The Highland Council
- Landowners Association
- National Trust for Scotland
- Local Garden Centres

[45] http://www.invasivespeciesscotland.org.uk/biosecurity_programme

Water resources

- West Highland Area Advisory Groups (River Basin Plans)
- Scottish Water
- Scottish & Southern Energy Plc
- Ullapool Harbour Trust
- Gairloch, Kishorn and Kyle of Lochalsh harbour offices
- Gairloch Boat Club
- Lochcarron Boat Club

Fisheries

- Wester Ross Fisheries Trust
- Wester Ross Area Salmon Fishery Board

Aquaculture

- Tripartite Working Group & local area management groups
- Scottish Salmon Producers' Organisation
- Scottish Shellfish Growers Association

Conservation & biodiversity

- Scottish Wildlife Trust including local groups
- National Trust for Scotland
- Royal Society for the Protection of Birds
- Scottish Native Woods
- Trees for Life
- Wester Ross Environment Network
- Skye and Lochalsh Environment Forum
- Plantlife
- Highlands Invasive Species Forum
- Gairloch Wildlife Group
- Ullapool Field Club

Schools

- Plockton High School
- Gairloch High School
- Ullapool High School
- Primary schools

The plan also seeks to engage with all members of the community who have an interest and/or a role to play in preventing the introduction or spread of INNS. These include: local garden centres; landowners, local water sport organisations; local angling clubs; local quarries; terrestrial and fish farmers and members of the public.

4.5 Existing INNS control activities

Gyrodactylus salaris

The Scottish Government has drawn up a National Contingency Plan and provided resources to prevent the introduction and spread of *Gyrodactylus*. To implement this locally, the DSFB have disrtibuted signs and disinfectant to local riparian owners. These are now displayed prominently on the region's major rivers.

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.

Skye and Lochalsh Action Forum

The Skye and Lochalsh Action forum have initiated projects to promote the control of *Rhododendron ponticum* and Japanese knotweed in the southern part of the WRFT area. In 2010, SLEF launched an initiative to locate and eradicate North American mink from the Skye and Lochalsh area. This programme is to run from August 2010 to April 2011.

The National Trust for Scotland

Within the area covered by this plan, the NTS own properties at Corrishallach, Inverewe, Torridon, Balmacara and Kintail. WRFT has worked with NTS to promote the control of invasive species, including *Rhododendron ponticum.*

Private landowners.

Many of the landowners within the WRFT have undertaken action to control and eradicate problem species within their ground. To achieve a sustainable outcome, it is important that their work is extended to other neighbouring areas.

Part 5 Biosecurity Management Strategy

The objectives of this plan will be achieved through a partnership approach to implement the following crucial actions:

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

5.1 Objectives and Outputs of Wester Ross and Lochalsh Biosecurity Plan

This section describes the proposed implementation of the plan and the actions required for their realisation. Actions for prevention are focused on the disruption of the pathways for the introduction and spread of INNS, translocated species and fish diseases and include a mixture of awareness raising and practical measures. 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.

The delivery mechanisms form the basis of the activities required to realise the objectives of this biosecurity management plan. Timetables for the activities relating to all objectives will be provided in Part 5.5, tables 9, 10 and 11.

Objective 1 Prevent the Introduction and Spread of INN species within the Wester Ross and Lochalsh areas

Key Actions

- Establish programme to raise awareness with stakeholders
- Encourage use of good practice within key stakeholder groups
- Establish and extend disinfection programme to cover likely pathways of entry

Awareness activities will be focused 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 and £6 billion pounds each year

- Can threaten our health

The local priorities are associated with disrupting the pathways for the introduction and spread of INNS in the Wester Ross – Lochalsh area and activities should be focused on the stakeholders involved. Priority areas and mechanisms for delivery for the key target stakeholders are presented in Table 5, while Table 6 presents the proposed delivery stakeholders for the priority areas and their roles in the prevention programme.

Table 5 Proposed priority areas for awareness and delivery mechanisms for target stakeholder groups.

Stakeholders	Suggested Priority areas	Suggested Mechanisms of Delivery
Aquaculture (SSPO, TWG) and local fish farmers	• Impact of INNS. • Use of biosecurity measures. • Dangers of importing from contaminated areas. • Controls on movement of stock and water.	• WRFT / RAFTS to liaise with local industry and trade associations to advise members regularly of good practice of INNS. • Incorporation of INNS codes of good practice into TWG agreement. • Incorporation of INNS codes of good practice into SSPO/BTA industry codes of practice.
Ullapool Harbour Trust and harbour offices	• Need to avoid pumping out of non sterilised ballast water in harbour. • Hull fouling.	• Promote implementation of code of practice requiring non-sterilised ballast water to be discharged away from harbour
Local Garden Centres	• Promote existing codes of practice covering the security and disposal of NNS to all garden centres • Target gardeners specifically	• All to work with garden centres to encourage distribution of codes and posters (available from Plantlife) and to advise the general public of INNS issues.
Water User associations (canoeists, sailing clubs)	• Promote awareness to clubs and participants of the dangers arising from INNS.	• WRFT/RAFTS to work with associations to promote disinfection of equipment and provide appropriate facilities to eliminate the risk of accidental transfer of INNS.
Local loch and river improvement associations	• Continue to promote awareness of the threat of INNS through improved communication.	• WRFT to work with associations to promote best practice and provide appropriate guidance.
Landowners and Fishery Proprietors	• Ensure that all tenants and resource-users are aware of biosecurity issues • Recommend suitable persons to act as “eyes” for the WRFT.	• WRFT/WREN/SLEF to ensure dissemination of good practice and appropriate signage to reduce threats from INNS. • WRFT/WREN others to offer training for “eyes”.
Angling Clubs (Ullapool, Gairloch, Kinlochewe, Shieldaig, Glenelg)	• Ensure all anglers are aware of biosecurity issues. • Ensure the distribution of information and signage in fishing huts and recognised car parks. • Recommend suitable members to act as “eyes”.	• WRFT to ensure dissemination of good practice and appropriate signage to reduce threats from INNS. • WRFT/RAFTS to work with associations to promote disinfection of equipment and provide appropriate facilities to eliminate the risk of accidental transfer of INNS. • WRFT to offer training for “eyes”.
General Public	• General awareness of impacts and measures to prevent/control INNS. • Promote the Biosecurity Plan to all retail outlets who deal with NNS e.g. pet shops, garden shops.	• Local Media Campaigns. • Use of websites (RAFTS, NNSS, Argyll & Bute Invasive Species Forum). • WRFT to develop a leaflet to promote Biosecurity dangers and reporting system.
Schools	• General awareness of impacts and measures to prevent/control INNS.	• School visits focusing on ecological clubs and encouraging appropriate field trips • Extend Salmon in the Classroom to include threats from INNS.
Contractors / Ground Maintenance Workers	- General awareness of impacts and measures to prevent/control INNS	- Work with WRFT to ensure dissemination of best practices - LFT to offer training for ‘‘eyes’’ • Invasive Species Scotland website

Table 6 Proposed priority areas for awareness and delivery mechanisms by delivery stakeholder group.

Stakeholders	Priority areas	Mechanisms of Delivery
The Highland Council	• Promote use of codes of good practice for construction, haulage, horticulture, aquaculture amongst local business and relevant departments particularly construction, garden and pet trade. • Promote awareness of planning, waste disposal and transport regulations amongst local business. • Promote awareness of the GB communications strategy to the general public.	• Councils to promote codes of good practice, e.g. including them with appropriate planning applications and building warrants. • Continue work of Highland Invasive Species Forum (HISF). • Production (by Council's legal department) and distribution of information leaflets on all relevant legislation relevant to INNS. • Holding of awareness event/open days to promote biosecurity issues. • Distribute leaflets with council tax bills. • Display posters (produced by RAFTS) in council offices, libraries and other public places.
WREN (Wester Ross Environment Network) & **SLEF** (Skye and Lochalsh Environment Forum)	• Identification and Recording of INNS within the area. • Local eradication and control programmes where there is manpower and volunteer support.	• Training for identification and reporting through local Biodiversity group (WREN). • Some of other actions as above. • Initiate local eradication and control programmes as and where appropriate.
Wester Ross Area Salmon Fishery Board **Fishery proprietors**	• Continue to promote awareness to anglers and angling clubs of the dangers arising from INNS through open days, field visits and demonstrations. • Signage & disinfection.	• Continue to promote disinfection of equipment and provide appropriate facilities. • Provision of leaflets and other info for angling guests and other visitors to estate land.
WRFT	• Continue to promote awareness to anglers and angling clubs of the dangers arising from INNS through open days, field visits and demonstrations. • Incorporate INNS issues into relevant guidance documents (as they are developed or updated).	• Page on website with links to relevant RAFTS-ISS and SEPA information and other sites e.g. Non-Native Species Secretariat, and Scottish Canoe Association. • Awareness raising at public events through displays, seminars and provision of related information with Newsletters and Annual Review.
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, and Scottish Canoe Association. • Digital documents available for download on SEPA Website.
SNH	• National: Promotion of good practice in the prevention, control and eradication of INNS. • Local: Text in preparation.	• Holding of SNH Sharing Good Practice events.
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 Ensure Optimum Detection and Surveillance of New Biosecurity Threats

Key Actions

- Establish an 'early warning system' for detecting new threats
- Develop rapid response protocols for new significant threats to local biodiversity and economy

A. Early Warning System

The "eyes" of the early warning system will be trained members of the public, fish farmers, bailiffs, ghillies, canoeists and walkers, with reported sightings verified by trained personnel. The 'eyes' can report a suspected INNS sighting to either the WRFT or Highlands Invasive Species Forum. A sighting of a GB or local high priority species (Table 7) will be verified within 48 hours by appropriate personnel. If confirmed, it will initiate the appropriate GB or local high priority response. Reports of priority species will be verified as time permits. All verified sightings will also be entered onto the WRFT, HBRC or HISF Geographic Information System (GIS) database to monitor INNS distributions within the Wester Ross and Lochalsh area.

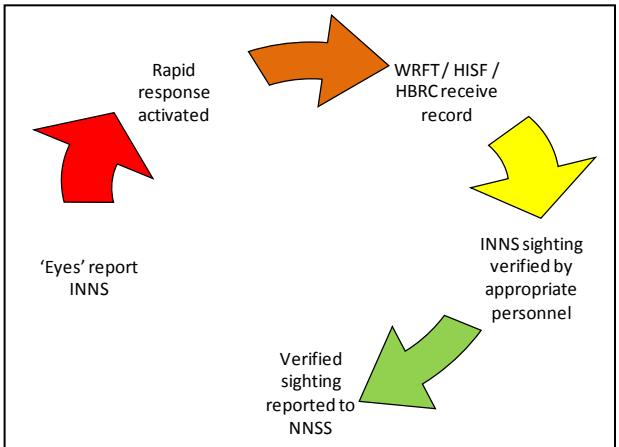


Figure 2. Pictorial representation of Proposed Early Warning System

B. Rapid Response Protocols

The type of response will depend on the severity of the species detected (Table 7) 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

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 or 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 interests.

Table 7 Proposed Response level for the invasive non-native species

GB Response	High Priority Local Response	Priority Local Response
Gyrodactylus salaris Asian topmouth gudgeon Ruddy duck *Didemnum* spp Water primrose	Pike Perch Australian swamp stonecrop North American signal crayfish Mitten crab Slipper limpet Zebra mussel Wireweed Ruffe Bullhead	American Mink Canadian pond weed Nuttal's pond weed Japanese knotweed Himalayan balsam Giant hogweed Rainbow trout Minnow New Zealand Flatworm Common cord grass Water fern Curly waterweed Parrot's feather *R. ponticum* Fanwort Large flowered waterweed Floating pennywort

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 8.

Table 8 Elements of contingency plans or protocols for response to GB priority, local high priority and priority local species Response as appropriate to INNS.

GB Response	High Priority Local Response	Priority Local Response
• Report to local and GB institutions. • Determine the extent of infestation. • Isolate area where practicable. • Subsequent action led by Government agencies.	• 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.

Note that for High priority and Priority responses, this plan proposes that local organisations including the Wester Ross Fisheries Trust play a key role in determining and taking the action that is needed to address problems.

Objective 3 Ensure Effective Control and Eradication Programmes for Threats are Operational, Sustainable and Effective

Key Actions

- Collect data on distribution and abundance of existing threats
- Develop and initiate control and eradication programmes to tackle threats

A. Collect data on distribution and abundance

For effective INNS control and eradication programmes, it is essential that the current distribution and abundance of INNS is known. To collect accurate and up-to-date on INNS distribution, the following actions are required:

- WRFT / other groups to modify existing habitat surveys to include presence and abundance of INNS;
- Specific INNS surveys for INNS are developed to fully address the question of INNS within the Wester Ross and Lochalsh area;
- WRFT and Highlands Invasive Species Forum will liaise to combine current knowledge of distribution and abundance of existing INNS with Wester Ross and Lochalsh area.

All collected and collated data will be copied to the HISF / HBRC / WRFT / RAFTS databases.

B. Develop and initiate control and eradication programmes

Control and eradication programmes will be developed in conjunction with key stakeholders using up-to-date advice on good practice for each INNS present. The WRFT will liaise with other practitioners including other Rivers and Fisheries Trusts for current good practice with regard to control and eradication programmes. Different stakeholders will be involved in and lead different programmes contingent upon which INNS are present. A combination of specialist contractors, volunteers, loch and river improvement associations, WRFT / DSFB staff and members of the Highlands Invasive Species forum are being and will be used depending on the management requirements of the area involved.

Gordon French of Morvern Community Woodland demonstrating the 'Lever and Mulch' method of dismantling a R. ponticum bush at the SLEF Lever & Mulch day at Kyle of Lochalsh, 5th November 2009. R. ponticum was the main focus of discussions at the WRFT Biosecurity debate at Poolewe on 21st January 2009. The control and eradication of ponticum within the area will require a co-ordinated and collaborative approach.

Existing and Proposed control and eradication programmes for Wester Ross and Lochalsh:

1. Mink

The Northwest Highland Mink Project is establishing a '*cordon sanitaire*' to prevent the spread on Mink north of line from the coast at Ullapool to Dornoch. Mink rafts, tunnels and traps are monitored by volunteers supported by a project officer. Further information can be obtained from Lois Canham lcanham@swt.org.uk or Wester Ross Fisheries Trust.

2. *Rhododendron ponticum*

R. ponticum established in many catchments. The proposal is to build on work to eradicate *ponticum* from the River Ewe – Loch Maree catchment, extending work at Coulin Estate and Beinn Eighe NNR.
A River Ewe – Gairloch *R. ponticum* eradication programme (one phase initiated per year):

- Phase 1: catchment areas to south of Loch Maree (Coulin, Cromasaig, Beinn Eighe NNR, Kinlochewe)
- Phase 2: Loch Maree Islands and shores, including Grudie, Talladale – Slattadale, ?Letterewe
- Phase 3: River Ewe, Inverewe, Tournaig and Loch Ewe (e.g. Inverasdale)
- Phase 4: Loch Gairloch: Flowerdale, River Kerry, Shieldaig, River Badachro

To address the widespread problem of this species there needs to be concerted effort involving landowners and Government agencies. The SRDP aims to support this approach. Some estates have already carried out a great deal of work and large areas have been cleared e.g. Coulin Estate. For gains to be sustained, complete eradication is required, this requires several years of follow up work.

3. Japanese knotweed

In some catchment areas, riparian stands of Japanese knotweed are still small in extent; these may offer relatively 'easy win' targets for initial actions, e.g. river catchment areas from Dundonnell – Poolewe & the River Ewe. However there are more challenging catchments such as the Broom and some rivers in the Lochalsh area. Additional distributional data is required to eradicate Japanese knotweed from the area.

4. Himalayan Balsam

Although poorly recorded it is considered not to have become established within Wester Ross. Only small areas known, mostly in domestic gardens and any populations in the wild may be relatively easily eradicated from the area.

5.2 Monitoring

Progress in the implementation of this plan will be determined by the level of engagement, support and commitment of the stakeholders and partners to deliver actions for 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 Wester Ross and Lochalsh area
- 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 priority areas 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 district and assessing them in terms of risk for the introduction of INNS.
- Monitoring activities will be undertaken by the Invasive Species Forum and WRFT ad other relevant groups in conjunction with stakeholder representatives who will be aware of local initiatives and priorities for action. A timetable for monitoring the implementation of the plan will be agreed following the consultation period and launch of the plan.

5.3 Timetable of Activities

The tables below presents the actions required to realise the objectives and outputs described in Section 5.1 along with the lead agency, key partners and timeframe required for their implementation.

Please note that the Invasive Species Forum (ISF) for the Highlands and Islands works in partnership with the Wester Ross Environment Network (WREN) and Skye and Lochalsh Environment Forum (SLEF).

Objective 1 Prevent the introduction and spread of new invasive non-native species and fish diseases within the Wester Ross area

A. Establish programme to raise awareness with stakeholders

B. Encourage use of good practice within key stakeholder groups

C. Establish and extend disinfection programme to cover likely pathways of entry

Key: ▬ Solid line indicates continuous action ┈┈ Dotted line indicates ongoing / wide timescale effort

Action	Lead Partner	Partners	Timescale						
			2010	2011	2012	2013	2014	2015	2016
Launch of Wester Ross & Lochalsh Biosecurity plan through national and local press - create press release.	WRFT /ISF	All & RAFTS	▬						
Raise awareness of legislation: produce leaflet on legislation including waste management & planning regulations	Highland Council	SNH, AAG	▬	▬	▬	▬	▬	▬	▬
Raise awareness of biosecurity: produce leaflet on biosecurity risks and reporting systems	ISF / WRFT	AAG, SNH	▬	▬	▬	▬	▬	▬	▬
Establish disinfection facilities: expand facilities	DSFB / Marine Scotland	WRFT / landowners	┈┈	┈┈	┈┈	┈┈	┈┈	┈┈	┈┈
Develop interim code of practice with port authorities	Port Authority		▬	▬					
Engage retail outlets and clubs at open days and events such as agricultural shows	ISF / WRFT /	SNH	┈┈	┈┈	┈┈	┈┈	┈┈	┈┈	┈┈
Meeting with landowners and angling clubs to promote awareness with tenants, resource users, members and visitors.	WRFT / ISF	DSFB	┈┈	┈┈	┈┈	┈┈	┈┈	┈┈	┈┈
Engage environmental groups of schools & communities	WRFT /ISF		┈┈	┈┈	┈┈	┈┈	┈┈	┈┈	┈┈
Expand Classroom projects to include INNS	WRFT /ISF	RAFTS	┈┈	┈┈	┈┈	┈┈	┈┈	┈┈	┈┈

Objective 2 Establish optimum surveillance, detection, monitoring and rapid response systems for the identified invasive non-native species and fish diseases which pose significant threats to local biodiversity and economy:

A. Establish an 'early warning system' for detecting new threats

B. Develop rapid response protocols for new significant threats to local biodiversity and economy

Action	Lead Partner	Partners	Timescale						
			2010	2011	2012	2013	2014	2015	2016
A. Early Warning system									
Agree 'Early warning system' protocol	WRFT	ISF							
Train WRFT personnel in identification of INNS	WRFT	RAFTS, SNH, SEPA							
Train WRFT as INNS identification trainers	WRFT	RAFTS, SNH							
Work with stakeholder groups to identify and train 'eyes'	WRFT	ISF							
Develop reporting system for notification of INNS sightings	WSFT/ RAFTS	ISF, SEPA National							
Produce database to record and manage INNS sightings	RAFTS								
Monitoring of non-native fish & non native genotypes	WRFT	MS							
B Rapid response protocol									
Formulate contingency plans for 'High priority local' INNS	RAFTS,	ISF, SNH, SEPA							
Formulate contingency plans for key species	, RAFTS WRFT	Highland Council, SEPA and SNH							
Identification of personnel for response teams	WRFT,	Highland Council, SEPA and SNH							
Training of personnel to execute contingency plans	WRFT,	Highland Council, SEPA and SNH							
Refresher training	WRFT	RAFTS, SNH							
Monitor populations/treated areas	WRFT	SNH, SEPA							

Objective 3 Effective control and eradication programmes for existing invasive non-native species and fish diseases are operational and sustainable.

A. Collect data on distribution and abundance of existing threats;

B. Develop and initiate control and eradication programmes to tackle threats.

Action	Lead Partner	Partners	Timescale						
			2010	2011	2012	2013	2014	2015	2016
A. Collect data									
WRFT Habitat surveys to include INNS	WRFT	SFCC							
Conduct INNS surveys in priority areas R. Ewe-Loch Maree Catchment	WRFT	ISF							
Liaison between WRFT and ISF re. Current distribution and abundance of INNS within Wester Ross and nearby areas	WRFT	ISF							
Create INNS GIS data base	ISF	WRFT / RAFTS, SFCC, SEPA National							
B. Develop and initiate control and eradication programmes									
Identify and attain funding for programmes	ISF / WRFT								
Develop & Initiate a River Ewe-Loch Maree biosecurity programme	WRFT	Ewe FMG, SEPA[46]							
Continuation of American mink programme	RAFTS/	WRFT/ISF SNH							
Continuation of existing Japanese knotweed programmes	SCLEF / ISF/ Landowners	SEPA[47]							
Extension of existing Japanese knotweed programmes to eradicate it from Wester Ross & Lochalsh	ISF	SEPA[48]							
Continuation and extension of existing Rhododendron programmes	NTS/ ISF/FCS Landowners								
Development of Himalayan balsam eradication programme	ISF	SEPA[49]							
Monitor and evaluate efficacy and control and eradication programmes	WRFT/ ISF	SNH, SEPA							
Identify and develop opportunities for future funding of eradication projects	WRFT	Highland Invasive Species Forum SEPA AAG FC SNH							

[46] May be eligible for funding from the Restoration Fund
[47] May be eligible for funding from the Restoration Fund
[48] May be eligible for funding from the Restoration Fund
[49] May be eligible for funding from the Restoration Fund

Acknowledgements

Dr James Merryweather, Rob Dewar (NTS Inverewe), Barbara McRitchie (NTS Blamacara), Nicola Tallach & Mary Gibson (SNH Kinlochewe Area Office), Janet Bromham & Jonathan Willet (The Highland Biodiversity Partnership), Lindsey Duncan (The Highland Council Countryside Ranger), Dr Brian Boag (Scottish Agricultural College), Prof Barry Blake, Roger Cottis, Lois Canham (SWT-SNH-RAFTS Mink Project Officer), Dr Jock and Margie Ramsay (Beekeepers), Norman Thomas .

Dr Chris Horrill (RAFTS Invasive Species Project Officer), Alan Kettle-Whyte (Argyll Fisheries Trust), Simon McKelvie (Cromarty Firth Fisheries Trust), Jim Raffell (FRS Shieldaig Sea trout Project).