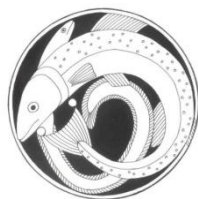


Lochaber Rivers and Lochs Biosecurity Plan

2009-2015

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 plant 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
DSFBs	District Salmon Fisheries Boards
FCS	Forestry Commission Scotland
HISF	Highland Invasive Species Forum
LBAP	Lochaber Biodiversity Action Plan
LBG	Lochaber Biodiversity Group
LFT	Lochaber Fisheries Trust
MS	Marine Scotland
NNSS	Non Native Species Secretariat
RAFTS	Rivers and Fisheries Trusts of Scotland
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

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Executive Summary

This plan describes the biosecurity issues of Lochaber 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 invasive species (INNS), fish diseases and parasites. The vision of this plan is:

‘To develop a sustainable framework to prevent, detect, control and eradicate invasive non-native species within the Lochaber region through the coordination of data collection, management, liaison, and education’

Objective 1: Prevent the introduction and spread of INNS within Lochaber.

- 🌿 Output 1.1 – All key stakeholders aware of;
 1. The ecological and economic impacts of INNS
 2. The potential pathways for introduction and spread of INNS.
 3. Management best practices to prevent introduction and spread of INNS.

Objective 2: Establish framework for the detection and surveillance of INNS, linked to a protocol to ensure a rapid management response.


- 🌿 Output 2.1 - ‘Reporting system’ established for INNS in Lochaber.
- 🌿 Output 2.2 – Develop strategic monitoring of INNS in Lochaber.
- 🌿 Output 2.3 – Rapid response mechanism established for new INNS which pose significant threats to local biodiversity and economy.

Objective 3: Develop coordinated control and eradication programmes for INNS.



- 🌿 Output 3.1 – Coordinated control, eradication and habitat restoration programmes established and operational.

The implementation of this biosecurity plan will bring many socio-economic and environmental benefits and a summary of these are described below:

- 🌿 Prevention of the deadly salmon parasite *Gyrodactylus salaris* from entering Lochaber, which would cause catastrophic economic and environmental loss.
- 🌿 Increased biodiversity and the conservation of important natural habitats for native species such as Atlantic salmon, sea trout, otter, European eel and freshwater pearl mussel.
- 🌿 Protection of the endangered water vole from American Mink.
- 🌿 Improved stability of riverbanks through the removal of annual, non-native plant species.
- 🌿 Maintenance of access to riverbanks for recreation and angling through the removal and control of invasive plant species such as Japanese knotweed and giant hogweed.
- 🌿 Prevention of significant economic loss that INNS could cause for local hydroelectric, water abstraction and aquaculture industries.

 Conservation and increased amenity value of local landscapes.

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.

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

Action	Lead	Partners	TIMEFRAME								
			2010	2010	2011	2011	2012	2013	2014	2015	2016
Objective 1: Prevent the introduction and spread of INN species within the Cromarty Firth fisheries district.											
Launch of Lochaber Biosecurity plan through national and local press release	LFT			—							
Produce leaflet on legislation including waste management & planning regulations	Highland Council	SNH, AAG		—	—						
Produce leaflet(s) on biosecurity issues and the reporting system	RAFTS	AAG, SNH		—							
Produce posters on biosecurity issues and distribute to the general public	RAFTS	LFT AAG Highland Council			.....	.....	.....	.....	.....	.....
Continue to promote and install disinfection facilities for anglers at all angling proprietors fishing huts/parking points	LDSFB				.....	.....	.....	.....	.....	.....
Develop interim code of practice with Harbour Authority	Port Authorities	LFT		—	—						
Distribute Codes and posters to relevant retail outlets and clubs at open days and events such as agricultural shows	HISFI	LFT, AAG members			.....	.....	.....	.....	.....	.....
Engage with Landowners and angling clubs to promote awareness of measures to tenants, resource –users, members and visitors	LFT LDSFB	SEPA, SNH		—	—						
Work with environmental groups and local schools to enhance awareness of INNS	LFT	SNH Highland Council Ranger Service			.....	.....	.....	.....	.....	.....
Objective 2: Establish framework for the detection and surveillance of INN species, linked to a protocol to ensure a rapid management response.											
Output 2.1 - 'Reporting system' established for INN species in Lochaber.											

Action	Lead	Partners	TIMEFRAME								
			2010	2010	2011	2011	2012	2013	2014	2015	2016
Train LFT personnel in the identification of INNS	LFT /RAFTS			—————	—————						
Train LFT as trainers	LFT /RAFTS			—————							
Work with user and interest groups to identify “reporting network”	LFT	LDSFB Highland Council SNH AAG SEPA LBG		—————	—————						
Training of “reporting network”	LFT	RAFTS LBAP SEPA		—————			———	———	———	———	———
Establish, test and refine communication mechanisms within ‘early warning’ system	LFT Highland Council	RAFTS, SEPA (National)		—————	—————						
Produce database to record and manage INNS sightings	RAFTS			—————							
Monitor and periodically evaluate efficacy of system	LFT & other partners			.....	.....	.....	.....	.....	.....	.....	.....
Output 2.2 – Develop strategic monitoring of INN species in district.											
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	LFT	SFCC/RAFTS SEPA Highland Council, LBG		.....	.....	.....	.....	.....	.....	.....	.....
Develop monitoring manual	SFCC	RAFTS, SEPA (National)	—————								
Output 2.3 – Rapid response mechanism established for new INN species which pose significant threats to local biodiversity and economy.											
Formulate contingency plans for key species	RAFTS and LFT	Highland Council, SEPA, SNH		—————							
Identification of personnel for response teams	LFT and SNH	Highland Council, SEPA		—————							
Training of personnel to execute contingency plans	LFT and SNH	Highland Council, SEPA		—————							
Refresher training	LFT	Highland Council, LBG					———	———	———	———	———
Monitor populations/treated areas	LFT	SNH, SEPA, LBG		.....	.....	.....	.....	.....	.....	.....	.....
Objective 3: Develop coordinated control and eradication programmes for INNS											
Output 3.1- Collect data on the distribution and abundance of existing threats											

Action	Lead	Partners	TIMEFRAME									
			2010	2010	2011	2011	2012	2013	2014	2015	2016	
Initiate and complete catchment wide surveys by trained personnel	LFT	SFCC		—————								
Develop GIS database for recording and mapping INNS	LFT	SFCC, RAFTS, SEPA		———								
Objective 3.2 – Develop and initiate control and eradication programmes												
Phase 1 - continuation of knotweed control programme on Lochy	River Lochy Association	LFT Esmée Fairbairn Foundation, SEPA	—————									
Implementation of Phase 2 of control/eradication programme for INNS plants	LFT	SEPA, Local volunteers, RAFTS		- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -
Monitor the effectiveness of control programmes	LFT			- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -
FRS monitoring of Notifiable fish diseases and red vent syndrome	MSS			—————	—————	—————	—————	—————	—————	—————	—————	—————
Objective 3.3 – Coordinate partnerships to source future funding and develop projects												
Complete draft Biosecurity plan	LFT		———									
Consultation with all stakeholders to agree Biosecurity plan	LFT		———									
Identify and develop opportunities for future funding of eradication projects	LFT	Highland Invasive Species Forum SEPA AAG FC SNH		- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -	- - - - -

1. Scope and Purpose

This plan describes the biosecurity issues of Lochaber 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 invasive species (INNS), fish diseases and parasites. The vision of this plan is:

‘To establish a sustainable framework that will prevent, detect, control and eradicate invasive non-native species within the Lochaber region through appropriate management, data collection, liaison, and education’




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

Objective 1: Prevent the introduction and spread of identified INNS within the Lochaber region.

Objective 2: Develop systems to ensure the detection and surveillance of identified INNS and rapid response to the threat.

Objective 3: Develop effective control and eradication programmes for identified INNS present in Lochaber.


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 for Great Britain](#)¹:

-  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 summarised below:

-  Prevention of the deadly salmon parasite *Gyrodactylus salaris* from entering Lochaber, which would cause catastrophic economic and environmental loss.

¹ www.nonnativespecies.org

- 🌿 Increased biodiversity and the conservation of important natural habitats for native species such as Atlantic salmon, sea trout, otter, European eel and freshwater pearl mussel.
- 🌿 Protection of the endangered water vole from American Mink.
- 🌿 Improved stability of riverbanks through the removal of annual, non-native plant species.
- 🌿 Maintenance of access to riverbanks for recreation and angling through the removal and control of invasive plant species such as Japanese knotweed and giant hogweed.
- 🌿 Prevention of significant economic loss that INNS could cause for local hydroelectric, water abstraction and aquaculture industries.
- 🌿 Conservation and increased amenity value of local landscapes.

2. Background

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

The need for action on biosecurity issues has been identified in the Trust's new Fisheries Management Plan ([Lochaber Fisheries Management Plan²](#)). This biosecurity plan provides 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. As such the successful implementation of this plan will rely on the formation of strong local partnerships founded on solid legal and policy principles by a range of interested parties.

The plan was produced using a participatory planning process coordinated by the LFT 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 LFT, stakeholders and appropriate local regulatory for the prevention, early detection and control of non native invasive species, fish diseases and parasites. The spread of INNS is a risk throughout Scotland and this plan is one 25 providing coverage across most of the country. The plan will facilitate coordination and communication with the neighbouring fisheries Trusts, Boards, local authorities and other stakeholders of neighbouring areas

² http://www.rafts.org.uk/FileLibrary/FMPPProject/LochaberFisheriesManagementPlan_2_.pdf

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 well as intentional introduction, establishment and spread of INNS, 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 considered in relation to the potential introduction and spread of a priority list of INNS and fish diseases.

A [survey](#)³ commissioned by Scottish Natural Heritage in 2000, shows 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 \(2006\)](#)⁴, **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 the 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 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:

- 🌿 [DEFRA](#)⁵ have estimated that INNS cost the UK economy £2 billion per year
- 🌿 In the UK Japanese Knotweed is thought to affect an area roughly the size of London and the [Review of Non-Native Species Policy \(2003\)](#)⁶ has estimated the total cost of its removal using current techniques at £1.56bn.

³ www.snh.org.uk/pdfs/publications/review/139.pdf

⁴ <http://www.cbd.int/gbo2>

⁵ <http://www.defra.gov.uk/wildlife-countryside/wildlife-manage/non-native/index.htm>

⁶ <http://www.defra.gov.uk/wildlife-countryside/pdf/wildlife-manage/non-native/review-report.pdf>

- 🌿 A Scottish Government [report](#)⁷ 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](#)⁸ 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.
- 🌿 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 a 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 the first step 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. This local plan and its implementation is also part of a strategic and coordinated approach to INNS management being undertaken across Scotland by RAFTS members.

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 to prevent introductions and 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 Lochaber region. These approaches are consistent with, and support, the [GB Invasive Non Native Species Framework Strategy](#)⁹ and the [Species Action Framework](#)¹⁰ both of which have been approved by the Scottish Government.

⁷ www.scotland.gov.uk/resource/doc/1062/0042434.pdf

⁸ [http://www.forestresearch.gov.uk/pdf/Argyll_Bute_rhododendron_2008_costs.pdf/\\$FILE/Argyll_Bute_rhododendron_2008_costs.pdf](http://www.forestresearch.gov.uk/pdf/Argyll_Bute_rhododendron_2008_costs.pdf/$FILE/Argyll_Bute_rhododendron_2008_costs.pdf)

⁹ www.nonnativespecies.org

¹⁰ www.sng.org.uk/speciesactionframework

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 invasive non native species, fish diseases and parasites:

- 🌿 Section 14 of [The Wildlife and Countryside Act \(1981\)](#)¹¹ 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](#)¹² 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](#)¹³ regulates the use of pesticides and herbicides for the control and eradication of INNS.
- 🌿 [Environmental Protection Act 1990](#)¹⁴ 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](#)¹⁵ 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”.
- 🌿 [Controlled Waste \(Registration of Carriers and Seizure of Vehicles\) Regulations 1991](#)¹⁶ and the [Environmental Protection \(Duty of Care\) Regulations 1991](#)¹⁷ provide guidance for the handling and transfer of controlled waste.
- 🌿 [The Aquaculture & Fisheries \(Scotland\) Act 2007](#)¹⁸ that regulates against the unauthorised introduction of fish to inland waters.
- 🌿 The [Prohibition of Keeping or Release of Live Fish \(Specified Species\) Order 2003](#)¹⁹ requires that a licence be obtained for the keeping or release of species listed on Schedules 1 and 2.

¹¹ www.opsi.gov.uk/RevisedStatutes/Acts/ukpga/1981/cukpga_19810069_en_1

¹² www.opsi.gov.uk/acts/acts1997/ukpga_19970008_en_1

¹³ www.opsi.gov.uk/legislation/scotland/ssi2005/20050066.htm

¹⁴ www.opsi.gov.uk/acts/acts1990/ukpga_19900043_en_1

¹⁵ http://www.opsi.gov.uk/si/si1994/uksi_19941056_en_1.htm

¹⁶ www.opsi.gov.uk/si/si1991/Uksi_19911624_en_1.htm

¹⁷ www.opsi.gov.uk/si/si1991/uksi_19912839_en_1.htm




¹⁸ http://www.opsi.gov.uk/legislation/scotland/acts2007/asp_20070012_en_1

 The [NetRegs](http://www.netregs.gov.uk)²⁰ website contains useful guidance on INNS and their control

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

-  The Lochaber Fisheries Management Plan,
-  The Argyll and Lochaber and West Highland Area and Scotland River Basin Management Plans,
-  The Lochaber Biodiversity Action Plan.

Furthermore, it supports the conservation objectives of designated conservation areas (SAC, SPA and SSSI) in the Lochaber region.

Table 1 Identified actions in the Lochaber Biosecurity Plan supporting provisions or requirements of other relevant plans

Provision or Requirement of Existing Plan	Action in Lochaber Biosecurity Plan
<p>Lochaber Fisheries Management Plan Provision: Continue project to eradicate Japanese knotweed from the banks of the River Lochy. Prepare contingency plans detailing the actions to be taken in the event of non-native species arriving in Lochaber. Raise awareness of the damaging effects of non-native species amongst river managers, anglers and the wider public to provide an early warning system and reduce deliberate or accidental introductions</p>	<p>This plan will fulfil the aims of the Lochaber FMP by setting out a strategy to raise awareness of INNS, control existing INNS and providing a framework for the early detection and rapid response to new introductions.</p>
<p>Gyrodactylus salaris (Gs) Contingency Plan²¹: Provision: A strategy to rapidly contain and eradicate Gs if introduced to Scotland.</p>	<p>This plan will raise awareness amongst the public and encourage early detection. The plan reinforces the need for disinfection of equipment moved between catchments.</p>

¹⁹ <http://www.scotland.gov.uk/resource/doc/47133/0009766.pdf>

²⁰ <http://www.netregs.gov.uk/netregs/default.aspx>

²¹ www.scotland.gov.uk/Topics/Fisheries/Fish-Shellfish/18610/diseases/g-salaris/GsCGrev

Provision or Requirement of Existing Plan	Action in Lochaber Biosecurity Plan
<p>The RBMP for Scotland and the The Argyll and Lochaber and West Highland Area Management Plans²²</p> <p>Provision:</p> <ul style="list-style-type: none"> • 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 	<p>RBMPs can help facilitate a coordinated and widespread response to biosecurity issues through the area advisory groups (AAGs) and the implementation of the area management plans by:</p> <ul style="list-style-type: none"> • Raising awareness of biosecurity issues • Acting as a conduit for national initiatives into the local management sphere • Develop and encourage catchment-based approach to control and eradication • Ensure control methods do not impact on the water environment • Monitoring and reporting progress <p>This plan will provide a mechanism by which the acknowledged threat of INNS to freshwater environments can be controlled or prevented within Lochaber. It suggests a partnership approach that is consistent with the Area Management Plan process.</p>
<p>The Lochaber Biodiversity Action Plan²³</p> <p>Provision: The Lochaber LBAP identifies Rhododendron, Japanese knotweed, mink and brown rats as the major threats in the region. A training programme for land managers and road maintenance workers and a mink and rat trapping project are proposed.</p>	<p>This plan will enable the survey and effective control of the INNS identified in the LBAP and, through the LFT and RAFTS provide a means of training land managers and spreading best practice in control measures.</p>
<p>Plans supporting designated conservation areas (SACs and SSSIs).</p> <p>Scotland's Biodiversity: A strategy for the conservation and enhancement of biodiversity in Scotland²⁴.</p>	<p>This plan supports the conservation of biodiversity target species through the control and eradication of INNS detrimental to their ecology</p>
<p>Objectives of the Highland Invasive Species Forum</p> <p>Provision: 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.</p>	<p>This plan identifies lead organisations and mechanisms by which the aims of the forum to raise awareness, spread good practice and initiate control measures can be achieved.</p>

²² www.sepa.org.uk/water/river_basin_planning.aspx

²³ <http://www.highlandbiodiversity.com/htm/counties/lochaber/lochaber.php>

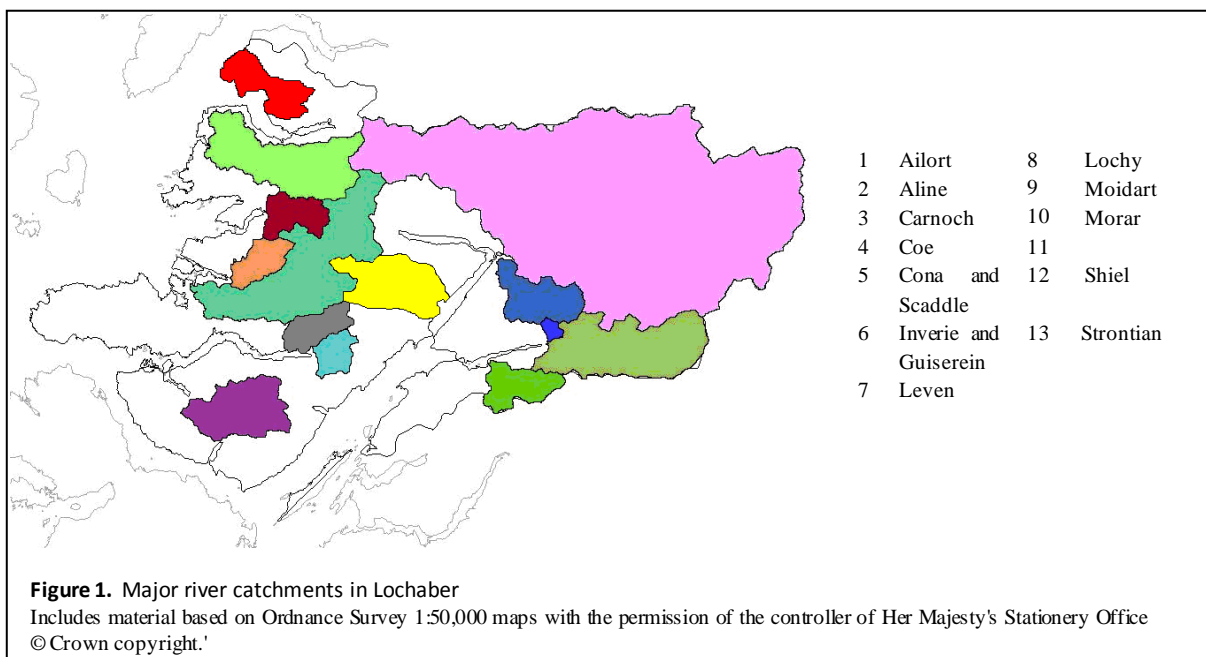
²⁴ www.scotland.gov.uk/Publications/2004/05/19366/37239

4. Scope of the Plan

4.1 The Lochaber region

Lochaber is a region of superlatives. It has the tallest mountain, deepest loch and highest rainfall in Britain. The result of the steep terrain and wet weather is numerous small spate rivers that rise and fall rapidly and have rocky, often unstable substrates. Lochaber has few large rivers and no extensive catchments on the scale of those in the east of Scotland. The underlying geology of the region is largely composed of Moine schists and Granitic gneisses that produce nutrient poor soils and run off, and result in oligotrophic lochs and rivers.

The Lochaber region covers 13 major river catchments and numerous other smaller rivers and burns.



The major catchments are shown in Figure 1. The majority of Lochaber's rivers have been classified as high or good according to SEPA's WFD scheme. There are a number of large, deep oligotrophic lochs in the region, two of which (Lochs Shiel and Morar) are designated as Sites of Special Scientific Interest. In addition, there are numerous smaller hill lochs, many of which are remote and little accessed. Most of the lochs in Lochaber are classified as high or good status by SEPA.

The Lochaber coastline is heavily indented forming long, sheltered sea lochs with numerous small islands. Sub-tidal reefs and Maerl beds have developed on the west coast and extensive mudflats are exposed at low tide around Kentra Bay and Loch Moidart.

There are three rivers within the region designated as Special Areas of Conservation for their freshwater pearl mussel populations. A number of UKBAP priority species are also present in the freshwater habitats of Lochaber: Atlantic salmon, sea trout, arctic charr, eel, brook lamprey, otter, black-throated diver and common scoter.

4.2 Summary of land use in Lochaber

The poor soils and steep terrain of Lochaber limit agriculture, and in many areas land use is limited to rough grazing and stalking on moorland heath. Improved grassland and crops are present along river edges and coasts, but even here management is relatively extensive.

Non-native conifers have been planted across Lochaber, but forestry is concentrated in Glen Nevis, the upper reaches the Lochy catchment (Glen Spean, Glen Pean, Glen Dessary, Loch Arkaig), Glen Finnan and Glen Hurich (Shiel catchment) and Lochaline. Sitka spruce, lodgepole pine and larch are the most common species planted. Native broadleaves are also widespread across the region and many rivers and burns are well-wooded along their banks.

Lochaber is marketed as the “Outdoor Capital of the UK” and tourism is the mainstay of the local economy. Large numbers of people from across the globe visit each year to take part in activities such as hill-walking, canoeing, rafting, sailing, fishing, mountain biking and skiing. Some activities are controlled, and organised tours and events are popular, but many people bring their own equipment and travel independently.

Recreational fishing is a popular activity in Lochaber with salmon, sea trout, brown trout and pike all exploited by anglers. Declines in salmon and sea trout catches occurred in all of Lochaber’s rivers from the late 1980s and few have recovered. The River Lochy is the most productive salmon river in the region and the only one run on a truly commercial basis. Most salmon and sea trout fisheries are not run commercially, and fishing is either included in holiday packages or reserved for the private use of owners and long-term tenants. Brown trout fishing is more accessible and all of the large lochs and many of the smaller hill lochs are regularly fished by local and visiting anglers. Pike and rainbow trout have been introduced into Lochs Arkaig and Lochy and a fishery exists for both species. There are many angling clubs within the region some of which play an active role in managing rivers. The artificial stocking of native salmon and sea trout is a widely used fisheries management tool across Lochaber.

Commercial fishing is still an important part of the local economy. Mallaig was once the most important herring port on Scotland’s west coast. Herring catches, and hence fishing activity, declined from the 1960s, but Mallaig remains an important port primarily for prawn and herring fishing vessels. Mallaig is also a major route through which farmed salmon are brought ashore for processing. Numerous small vessels operate out of Corpach, Glen Uig, Lochaline and other sites down the coast mainly creeling inshore waters for prawns. Barges also regularly dock at Corpach to service the nearby timber yard.

The ports of Mallaig, Lochaline and Kilchoan are used by Caledonian MacBrayne ferries running to Skye and the Small Isles and Mull respectively. Other recreational vessels from small yachts to cruise ships also use these ports and moorings along the coast notably at Glen Uig, Corpach, Strontian and Arisaig. The Caledonian Canal was built in the 1820s to link the lochs of the Great Glen and allow navigation between Fort William and Inverness. It is heavily used by recreational vessels, which commonly cross between the Lochy and Ness catchments.

There are a number of marine salmon farms in the sheltered sea lochs of Lochaber. Atlantic salmon, usually of Norwegian origin, are farmed on a two year production cycle. All the farms in Lochaber are covered by Area Management Agreements that encourage synchronous fallow periods and co-ordinated lice treatments across neighbouring farms. Freshwater salmon smolt farms are present in Loch Shiel, Loch Lochy, Loch Arkaig and Loch Arianas. A land-based salmon hatchery operates on the banks of the lower River Moidart. The rainbow trout farm on Loch Lochy closed in 2008 and the site has now been converted into a large salmon smolt rearing facility. Shellfish farming is expanding in the region. Mussel farms are present in Loch Eil, Loch Ailort and Loch Leven. A small oyster farm operates in Loch Ailort near the mouth of the river.

The fast-flowing rivers of Lochaber have for many years been harnessed to produce energy. The Laggan dam at the top of the River Spean was installed in 1919 to provide electricity for the Fort William Alcan plant. The scheme includes a pipe that discharges into the upper reaches of the Spey system, creating a potential link between the two catchments. Large hydroelectric dams operated by Scottish and Southern Energy are sited at Morar, Kingairloch and the top of the River Lochy. An increasing number of small, run-of-the-river schemes are being built or are proposed in the area.

Fort William is the only major urban area in Lochaber and most settlements are small and scattered. The gardens and ponds of many houses contain non-native species, some with the potential to spread into the wild. Sporting estates are common in Lochaber and the large houses and gardens associated with them are a source of non-native plants such as *Rhododendron* introduced in the 19th century.

4.3 Biosecurity: Current and potential threats

This subsection presents the current and potential threats from INNS and fish diseases in Lochaber.

4.3.1 Current biosecurity issues

A number of invasive non-native species are established in Lochaber. Their known distribution, impacts and potential means of spread are discussed below. Distributions are based on the best information available, but since few systematic studies have been undertaken, it is likely many species are more widespread than is indicated.

🌿 **Japanese knotweed** (*Fallopia japonica*) stands and those of the closely related giant knotweed (*Fallopia sachalinensis*) are present across Lochaber. This discontinuous distribution probably results from numerous separate introductions. Knotweed spreads quickly through the vegetative reproduction of cut plant parts. The more extensive stands along the shores of Loch Linnhe and the banks of the River Lochy (Figure 2) suggest natural spread of the plant has occurred along these waterbodies.

Dense stands of knotweed suppress riparian woodland regeneration and outcompete native vegetation, resulting in vulnerable bare banks when the plants die back in winter. The banks of the River Lochy are largely composed of soft sediment and prone to erosion in flood events. The presence of Japanese knotweed has exacerbated this problem. Knotweed also restricts access to the river for anglers. In other areas knotweed is currently not as widespread and its present impact is more limited.

Awareness of the damage that knotweed can cause has increased dramatically in recent years. That coupled with the legislation governing the species greatly reduces the risk of deliberate planting in the future. The main risk is from the spread of existing stands. Floods, trampling and wind damage could all break stems of the plant and allow it to spread naturally. Inappropriate cutting and dumping speeds the colonisation of new areas. Cut fragments of plants along riverbanks are transported downstream by the river.

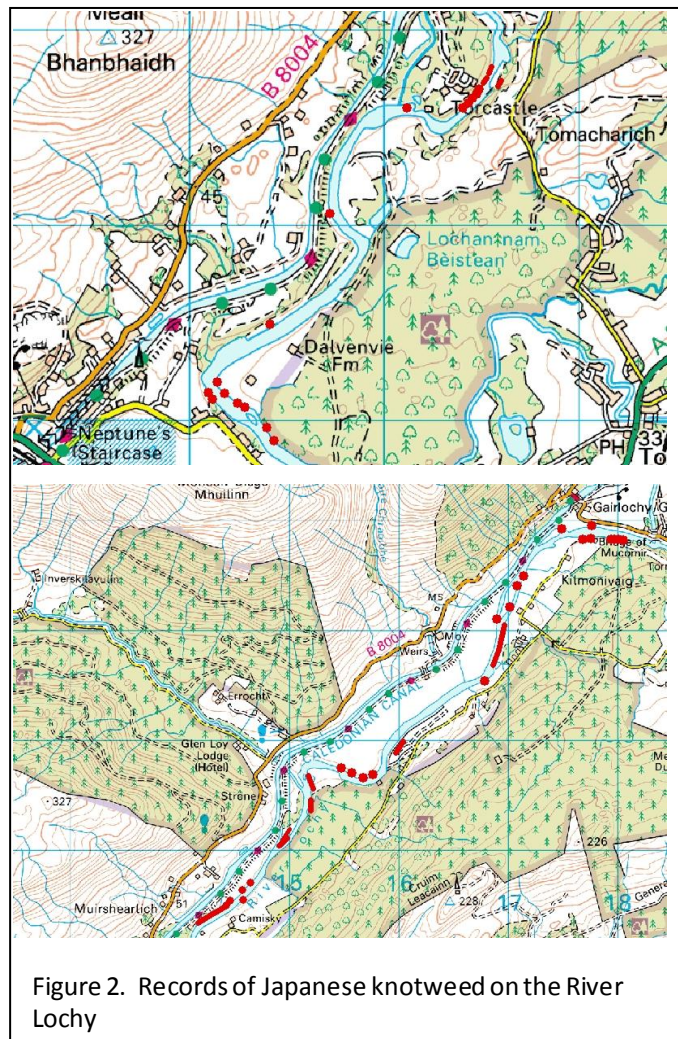


Figure 2. Records of Japanese knotweed on the River Lochy

🌿 ***Rhododendron ponticum*** were popular in the gardens of large Victorian houses and soon spread beyond the garden wall. The west coast of Scotland seems to provide ideal growth conditions and no woodland in Lochaber within a few miles of a big old house has escaped colonisation. River corridors are often badly affected but the species is not confined to this habitat and forms an understorey in all types of woodland and even thrives on open ground. The plant regenerates vegetatively and from seed and the widespread presence of small plants in Lochaber indicates that natural regeneration is occurring readily.

Rhododendron forms a closed canopy and acidifies the surrounding soil preventing other plants establishing. Its presence will destroy the native ground flora of woodlands and prevent tree regeneration. The rapid growth of Rhododendron along watercourses can lead to shading and reduced nutrient input. Stretches of the Rivers Slatach are particularly badly affected.

Rhododendron continues to be sold and planted as an ornamental garden plant. However, the present wide distribution and abundance of Rhododendron ensures that there is already sufficient seed and plant material to allow its further natural spread into suitable habitats across Lochaber.

- 🌿 **Himalayan balsam** (*Impatiens glandulifera*) Records of this plant in Lochaber are concentrated around the Lochy catchment and generally confined to road verges. The plant is usually in small isolated clumps, but larger stands are evident along Loch Eil.

Himalayan balsam grows quickly and excludes native plants. It is an annual and dies back in winter leaving bare banks vulnerable to erosion. Most of the stands present in Lochaber currently cause little impact due to their small size. However, the extensive areas of bare soil exposed on the side of Loch Eil in winter demonstrate the problems this species could cause if left to spread unchecked.

The seeds of Himalayan balsam remain viable for many years so natural spread of seeds or soil tipping are the most likely means of spread. The presence of balsam in a number of catchments mean there is the potential for this species to become a region-wide problem. It continues to be sold as a garden plant allowing the possible introduction to new areas where it is currently absent.

- 🌿 **Sitka spruce** (*Picea sitchensis*) **and other** non-native conifers have been planted across Lochaber for commercial forestry or shelter belts. In most cases the conifers are restricted to areas where they have been planted and ground conditions and grazing levels are modified to promote growth. However, sitka spruce appears able to seed out of plantations and establish on heath, moorland and native woodland in western Scotland. Most self-seeded sitka is close to forestry plantations, although records of the species in Lochaber indicate its ability to spread greater distances.

Sitka are fast growing, resistant to browsing and capable of outcompeting natural vegetation. They are capable of shading watercourses and preventing access to banks. The Forestry Commission's Forest Water Guidelines advise a 20m buffer zone free of conifers along watercourses. The ability of sitka to seed into such a buffer zone reduces their effectiveness.

Forestry plantations will remain the most likely seed source of invasive sitka. The edges of forestry tracks seem to provide ideal conditions for seedlings and it is likely sitka will spread along these corridors. The presence of isolated sitka trees in remote places suggest seeds can be dispersed for many miles so there is some potential for sitka to spread over greater distances. Grazing and browsing by livestock and deer will prevent sitka seedlings establishing and fenced areas close to existing plantations will be the most vulnerable to invasion.

- 🌿 **Mink** (*Mustela vison*) Although there has been no systematic survey of mink across Lochaber, mink are present in most of the major river catchments in the region. The Great Glen is thought to be a major dispersal route for the expansion of mink from the west coast to the highlands and

Moray Firth. Mink are a generalist predator. They can depress fish stocks and are capable of decimating water vole and ground-nesting bird populations. The original mink populations were the result of deliberate and accidental escapes from farms. No mink farms currently operate in the area, so the future spread will be the result of the natural dispersal of juveniles.

- 🐟 **Rainbow trout** (*Onchorhynchus mykiss*) are regularly seen and caught by anglers on Lochs Lochy and Arkaig and the Caledonian Canal. They predate juvenile salmonids and smolts and can also compete with native salmonids for food and shelter. The only rainbow trout farm in Lochaber ceased to operate in 2008. Escapes from this farm are the original source of the rainbow trout in the Lochy catchment. Only a few of the many rainbow trout escapes in Britain have resulted in self-sustaining populations, and no evidence of spawning has been seen in Lochaber. It is likely the population in Lochs Arkaig and Lochy will gradually decline through natural wastage. Life expectancies for rainbow trout in Britain are around three or four years so, in the absence of new introductions, it is predicted the rainbow trout population in Lochaber will die out by 2012.

- 🐟 **Minnow** (*Phoxinus phoxinus*) are known to be present in the Aline, Ailort, Leven, Lochy, Morar, Corrou and Shiel catchments. Large numbers have been seen in the Caledonian Canal. Minnow occupy broadly the same habitat as juvenile salmon and trout and may compete with them for food and shelter sites. Minnow are believed to have colonised Scottish catchments through deliberate introduction or discarded live bait. Improved awareness amongst anglers has probably decreased the risk of introduction, but live bait is still used and the risk remains. Reproduction and natural dispersion will allow minnow to spread to suitable, accessible areas within the catchments in which they are already present.

- 🐟 **Pike** (*Esox lucius*) are found in Lochs Lochy, Arkaig and Ossian. Reports of spawning activity and young pike provide evidence that pike are breeding in these lochs. There is insufficient evidence to establish if numbers are increasing, decreasing or remaining constant. Pike are piscivorous and they will predate native fish species including trout and salmon. Pike were commonly introduced to provide fishing opportunities and to small lochs to thin out trout populations and result in fewer, larger trout. It is unclear whether the presence of pike in large lochs such as Lochy and Arkaig would be capable of altering the population dynamics of trout or other native fish species. The introduction of pike into Lochs Lochy and Arkaig appears to have occurred many decades ago. There are no reports of recent introductions into other lochs in Lochaber. However, pike angling is a popular sport and future deliberate introductions are not impossible. Pike have already moved through the Caledonian Canal and are present in all the Great Glen lochs. However, it is difficult to see how pike could spread naturally from their current strongholds into other lochs in Lochaber.

4.3.2 Potential biosecurity issues

The invasive non native species listed below are not currently present within the Lochaber region. They have been classified as High or Medium level threats depending on their likely impact on the local economy and biodiversity 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 land use within Lochaber.

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

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

There are six High Threat level species that could be introduced into Lochaber. They include one fish parasite, one riparian plant, one marine and three freshwater invertebrates.

Table 2 High threat level species their impacts and risk of introduction

SPECIES	RISK OF INTRODUCTION	LOCAL IMPACTS
<i>Gyrodactylus salaris</i> (Freshwater external parasite of salmon)	High- Through unintentional introduction from anglers and water sport enthusiasts through: <ul style="list-style-type: none"> ▪ Contaminated fish ▪ Clothing/equipment which has been in contact with infected water including canoes ▪ Ballast water 	<ul style="list-style-type: none"> ▪ Predicted catastrophic impact on salmon (<i>Salmo salar</i>) populations throughout Scotland. (It has largely exterminated <i>S. salar</i> in 41 Norwegian rivers)
Giant hogweed (<i>Heracleum mantegazzianum</i>)	High – present in neighbouring regions. Possibility of introduction from contaminated soil or garden escape.	<ul style="list-style-type: none"> ▪ Forms dense stands that exclude native vegetation ▪ Sap causes skin irritation.
North American signal crayfish (<i>Pacifasticus leniusculus</i>)	High- Through intentional introduction or unintentional introduction through fish movements. Population on the Nairn could reach the Ness catchment and spread south via the Caledonian Canal.	<ul style="list-style-type: none"> ▪ Burrows into river banks causing destabilisation ▪ Diet include small fish, fish ova and invertebrates ▪ Competes with juvenile salmonids for shelters
<i>Didemnum tunicates</i> (<i>Didemnum spp</i>)	High- Present in Scotland, Ireland and Wales. Possibility of unintentional introduction from marine fishing boat hulls or contaminated aquaculture equipment	<ul style="list-style-type: none"> ▪ Marine habitat changes through overgrowth of sedentary benthic organisms such 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.

SPECIES	RISK OF INTRODUCTION	LOCAL IMPACTS
Zebra mussel (<i>Dreissena polymorpha</i>) Freshwater Bivalve	Medium -through unintentional introduction from contaminated boat/canoe hulls and engines and bilge water.	<ul style="list-style-type: none"> ▪ Major economic impact on all subsurface water structures e.g. blocking pipes and impacting upon hydro-electric schemes ▪ Varied and unpredictable ecological impacts including changes to freshwater nutrient cycles, extinction of local mussels and changes to stream substrate affecting spawning areas
Chinese mitten crab (<i>Eriocheir sinensis</i>) Resides in freshwater but migrates to the sea for breeding.	Medium -through unintentional introduction from boat hulls and live food trade.	<ul style="list-style-type: none"> ▪ Burrowing in high density populations damages river banks ▪ Concern over impacts on local species ▪ Intermediate host for the mammalian lung fluke <i>Paragonimus ringer</i>, known to infect humans

There are also 14 Medium Threat level species of which there is a medium risk for eight species and a low risk for six species (see Table 3 below).

Table 3 The risk of introduction of Medium Threat level INNS.




SPECIES	RISK OF INTRODUCTION
Water primrose (<i>Ludwigia grandiflora</i>)	Medium
Water fern (<i>Azolla filiculoides</i>)	Medium
Slipper limpet (<i>Crepidula fornicate</i>)	Medium
Curly waterweed (<i>Lagarosiphon major</i>)	Medium
Wireweed (<i>Sargassum muticum</i>)	Medium
Ruffe (<i>Gymnocephalus cernuus</i>)	Medium
Bullhead (<i>Cottus gobio</i>)	Medium
Common cord grass (<i>Spartina anglica</i>)	Medium
Large flowered waterweed (<i>Egeria densa</i>)	Low
Floating pennywort (<i>Hydrocotyle ranunculoides</i>)	Low
Parrot's feather (<i>Myriophyllum aquaticum</i>)	Low
Fanwort (<i>Cabomba caroliniana</i>)	Low
Asian topmouth gudgeon (<i>Pseudorasbora parva</i>)	Low
Ruddy duck (<i>Oxyura jamaicensis</i>)	Low

4.3.3 Fish Health and Genetic Issues

The presence of farmed salmon in Lochaber and the movement of fish and equipment associated with the aquaculture industry increase the threat of fish diseases spreading through the region. Such diseases can have devastating effects on wild and farm fish stocks. Escapes from fish farms could also introduce non-native salmon genotypes into wild populations.

Parasites & diseases

The Fish Health Regulations introduced in 1997 create a legal obligation to notify any suspicion of the presence of certain fish diseases. This legislation recognises three categories of [Notifiable Diseases in Fish](#)²⁵ depending on their status and potential impact on farm and wild fish stocks.

-  **List I** diseases are exotic to the EU and eradication measures are mandatory where the disease is detected, e.g. Infectious Salmon Anaemia
-  **List II** diseases are present in some EU member states and controls on the import of fish between infected and non-infected areas are in place, e.g. Viral Haemorrhagic Septicaemia and Infectious Haematopoietic Necrosis. Great Britain is currently a disease free zone for VHS and IHN.
-  **List III** diseases are more widespread and control measures are at the discretion of individual EU member states, e.g. Infectious Pancreatic Necrosis, Bacterial Kidney Disease, Furunculosis and *Gyrodactylus salaris*. Great Britain currently has control and eradication plans in place for BKD and *Gyrodactylus*.

The Fish Health Inspectorate undertakes regular checks of all fish farm sites and has the power to impose restrictions on fish movements and fallow sites if diseases are detected. In 2009 an ISA outbreak occurred on salmon farms in Shetland. Movement restrictions and fallowing were successful in preventing the spread of this disease and no cases were reported from Lochaber or surrounding regions.

Non-native genotypes

Fish farms are found in both sea and freshwater lochs across Lochaber. The salmon strains used vary between farms but most are derived from Norwegian stock. None are native to the region and all have reduced allelic diversity due to drift, inbreeding and selection. Large-scale escapes are not common but have been reported from both marine and freshwater sites in Lochaber recent years. The most frequently cited causes of farm escapes are predator damage, storm damage or human error. Efforts to improve containment through better equipment and processes have generally reduced the numbers of escapes but failed to prevent them occurring. Farm fish are regularly caught by anglers suggesting there is also more frequent leakage from farm cages. Given the current position of fish farms, the Rivers Lochy, Nevis, Cona, Scaddle, Leven, Coe, Strontian and Inverie are most vulnerable to escaped farm fish. Smolt farms located on Loch Shiel, Arkaig, Lochy and Arienas

²⁵http://www.marlab.ac.uk/Delivery/Information_resources/information_resources_view_document.aspx?resourceId=23697&documentId=1922

could affect these catchments. The introgression of farm fish genes will reduce the fitness and productivity of wild salmon populations (McGinnity et al. 2003)²⁶.

Stocking of salmon and trout from native wild broodstock is used as a fisheries management tool in many of Lochaber’s rivers. The use of native broodstock and the need to maintain genetic diversity within the stocked fish are crucial to these programmes.

4.3.4 Pathways of Introduction

From Tables 3 and 4, the main pathways or means of introduction of both high and medium threat level species into Lochaber are:

- 🌿 Intentional introduction or planting
- 🌿 Movement of fish and fish eggs for aquaculture, stocking and live bait
- 🌿 Fouling and ballast water of marine vessels
- 🌿 Fouling and ballast water of freshwater vessels
- 🌿 Escapes from garden ponds
- 🌿 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.
- 🌿 Natural dispersal by seeds, vegetative spread or migration.

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

4.4 Stakeholders

There are a numbers of organisations and individuals with an interest in INNS in Lochaber. The engagement of key stakeholders is imperative for the success of this plan. Regulatory agencies and other bodies with an interest in INNS include:

Policy and Legislation	Land Resources	Water Resources
Scottish Government Scottish Natural Heritage Scottish Environment Protection Agency Marine Scotland Association of Salmon Fishery Boards Rivers and Fisheries Trusts Scotland	Forestry Commission Highland Council Highland Invasive Species Forum Landowners Association	Argyll and Lochaber Area Advisory Group West Highland Area Advisory Group Scottish Water Scottish and Southern Energy British Waterways Aquaculture Tripartite Working group Scottish Salmon Producer’s Organisation Aquaculture Industry

²⁶ 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)

Fisheries Management	Recreation	Conservation and Biodiversity
Lochaber District Salmon Fishery Board Shiel District Salmon Fishery Sub-board Morar District Salmon Fishery Sub-board Lochaber Fisheries Trust Commercial Fisheries Industry	Fort William Canoe Club Mallaig Canoe Club Ramblers Association Local Angling Associations RYA	Scottish Wildlife Trust Royal Society for the Protection of Birds Scottish Native Woods Lochaber Biodiversity Action Group Plant Life Highland Biological Recording Group

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: British Waterways; local garden centres; landowners, local water sport organisations; local angling clubs; local quarries; farmers and members of the public.

The [Highland Invasive Species Forum](#)²⁷ is developing projects to map and coordinate control measures for five priority species namely: Rhododendron, Japanese knotweed, Himalayan balsam, giant hogweed and mink.

Stakeholders have been identified from an analysis of possible routes of introduction, spread or control of non-natives presented in Table 4.

Table 4 Pathways and stakeholder groups in Lochaber.

Pathway	Stakeholders
Intentional introduction or planting	Plantlife, riparian landowners, members of the public, Marine Scotland, local councils
Movement of fish and fish eggs for aquaculture, stocking and live bait	Aquaculture Industry, SSPO, Scottish Government, Marine Scotland, LDSFB, Angling associations
Fouling and ballast water of marine vessels	Local harbour authorities, SEPA
Fouling and ballast water of freshwater vessels	Port Authority, SEPA, UK Government; local canoe and water sports organisations
Escapes from garden ponds	Horticultural Trade Association, Ornamental Fish Producers, Marine Scotland, SEPA, Plantlife, public
Contaminated water sports equipment (e.g. from anglers, canoeists)	LDSFB, local canoe/water sports organisations, anglers, angling clubs and associations and tackle shops.
Movement of contaminated soils or vehicles	Highland Council, SEPA, quarries, building contractors, landscape contractors
Improper control and disposal measures e.g. cutting and dumping without treatment	Local councils, SEPA, environmental health, Plantlife, riparian owners/members of the public

This plan identifies key actions required to change the behaviour and practices of the above groups so as to reduce the opportunities for the introduction and spread of INNS and fish diseases.

²⁷²⁷ <http://www.highlandbiodiversity.com/htm/invasive-species/invasive-species.php>

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 LDSFB have distributed signs and disinfectant to local riparian owners. These are now displayed prominently on the region's major rivers. The LDSFB and LFT have distributed leaflets and attended meetings to raise awareness of this species amongst angling associations and canoeists.

Invasive Plant Species

A three year project funded by the Esmée Fairbairn Foundation is underway to clear Japanese knotweed from the banks of the River Lochy. River Lochy Association staff have undertaken biannual spraying of knotweed with glyphosate in an effort to eradicate knotweed from the upper catchment and control more extensive stands in the lower reaches of the river. Monitoring suggests the spraying has been effective in some areas, but that the project will need to be extended beyond 2011 to achieve sustainable control of the knotweed along the river.

Cutting, spraying, burning and 'lever and mulch' have all been used to control *Rhododendron* in the region. The most sustained effort has been a collaboration between Forestry Commission, SNH and Highland Birchwoods to remove *Rhododendron* from the Sunart Oakwoods. The Scottish Wildlife Trust and RSPB have achieved some success in controlling their species at their reserves at Doire Donn and Glenborrodale respectively.

Knotweed, skunk cabbage and self-seeded sitka are all controlled by cutting and spraying on Forestry Commission land in Glen Hurich at Sunart. Less coordinated attempts to control knotweed and *Rhododendron* have been carried out by other landowners throughout Lochaber.

Mink

Trapping and destruction of mink occurs regularly on the Lochy, Morar, Shiel, Aline and Strontian catchments. This has achieved temporary, local reductions in the mink population, but proper control or eradication of this species will require a co-ordinated approach over a much larger area than is currently taking place in Lochaber.

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 including Lochaber.

Lochaber Biodiversity Group

Members of the Lochaber Biodiversity Group in a series of pilot sites have developed the “lever and mulch” method for Rhododendron clearance which is now being used more widely in Northern Scotland.

5. Biosecurity management strategy

The objectives of this plan are based on three elements:

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

The involvement and participation of the stakeholders identified in section 4.4 will be essential to achieve the objectives of this plan.

5.1 Objectives and outputs of Lochaber Biosecurity Plan

This section describes the expected outputs from implementation of the three plan objectives 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 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 activities will be undertaken in a coordinated and systematic manner to eradicate identified INNS where feasible.

Objective 1: Prevent the introduction and spread of INNS within Lochaber.

Key Actions

- 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

Lochaber is currently relatively free from INNS and preventing the colonisation of new INNS offers the most efficient and effective means of control. Awareness-raising activities will be focussed on addressing local priorities as well as supporting the GB Awareness and Communication strategy and its key messages to the general public. The local priorities are associated with disrupting the pathways for the introduction and spread of INNS in Lochaber identified in section 4.3.4 of this plan. The key stakeholders, the identified areas of priority and the proposed mechanisms for delivery are

presented in Table 5 below. The roles and actions of key government agencies and non government bodies in promoting awareness of INNS issues is presented in Table 6.

Table 5. Priority areas for awareness and delivery mechanisms according to stakeholder group

Stakeholders	Priority Areas	Mechanism of Delivery
Aquaculture (SSPO, TWG) and local fish farm companies	<ul style="list-style-type: none"> - Impact of INNS - Use of biosecurity measures - Dangers of importing fish and water from contaminated areas - Controls on movement of stock and water 	<ul style="list-style-type: none"> - LFT to liaise with local industry and trade associations to advise members regularly of good practice 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 website
Port Authorities / British Waterways	<ul style="list-style-type: none"> - Need to avoid pumping out of non sterilised ballast water in harbour - Hull fouling 	<ul style="list-style-type: none"> - Promote implementation of code of practice requiring non-sterilised ballast water to be discharged away from harbour - Invasive Species Scotland website
Local garden centres	<ul style="list-style-type: none"> - Prevent introduction of non-native plants through garden escapes. - Target gardeners specifically to avoid planting and disposal of INNS 	<ul style="list-style-type: none"> - LFT to encourage distribution of codes and posters (available from Plantlife) and to advise the general public of INNS issues - Invasive Species Scotland website
Ornamental Fish Trade and Pond Alert	<ul style="list-style-type: none"> - Prevent introduction of non-native fish through pond escapes or poor disposal. - Promote code of practice to all pet shops and suppliers of ornamental fish 	<ul style="list-style-type: none"> - LFT to work with retailers to encourage distribution of codes and posters (available from Plantlife) and advise the general public of INNS issues - Invasive Species Scotland website
Water User associations (canoeists, sailing clubs)	<ul style="list-style-type: none"> - Prevent introduction of INNS through contaminated equipment. - Promote awareness to clubs and participants of the dangers arising from INNS 	<ul style="list-style-type: none"> - LFT to work with associations to promote disinfection of equipment and provide appropriate facilities to eliminate the risk of accidental transfer of INNS - Invasive Species Scotland website
Landowners	<ul style="list-style-type: none"> - Ensure that all tenants and resource-users are aware of biosecurity issues and potential pathways of introduction. - Recommend suitable persons to act as “eyes” for the LFT. - Display appropriate signage and provide disinfection facilities where appropriate. 	<ul style="list-style-type: none"> - LFT to ensure dissemination of good practice and appropriate signage to reduce threats from INNS - LFT to offer training for “eyes” - Invasive Species Scotland website

Stakeholders	Priority Areas	Mechanism of Delivery
Angling clubs	<ul style="list-style-type: none"> - Ensure all anglers are aware of biosecurity issues and damage live bait, fish introductions and movement of contaminated equipment can cause. - Ensure the distribution of information and signage in fishing huts and river access points. -Recommend suitable members to act as “eyes” 	<ul style="list-style-type: none"> - LFT to work with associations to promote disinfection of equipment and provide appropriate facilities to eliminate the risk of accidental transfer of INNS - LFT to ensure dissemination of good practice and appropriate signage to reduce threats from INNS -LFT to offer training for “eyes” -Invasive Species Scotland website
General Public	<ul style="list-style-type: none"> -General awareness of impacts and measures to prevent/control INNS -Promote the Biosecurity Plan to all retail outlets who deal with INNS e.g. pet shops, garden shops 	<ul style="list-style-type: none"> -Local Media Campaigns -Use of websites (RAFTS, NNSS, LFT) -LFT to promote Biosecurity dangers and reporting system -Invasive Species Scotland website
Schools	<ul style="list-style-type: none"> - General awareness of impacts and measures to prevent/control INNS 	<ul style="list-style-type: none"> -School visits focusing on ecological clubs and encouraging appropriate field trips Extend Salmon in the Classroom to include threats from INNS -Invasive Species Scotland website
Contractors / Ground Maintenance Workers	<ul style="list-style-type: none"> - General awareness of impacts and measures to prevent/control INNS 	<ul style="list-style-type: none"> - Work with LFT to ensure dissemination of best practices - LFT to offer training for “eyes” -Invasive Species Scotland website

Table 6. Roles and/or actions of key government and non government agencies in promoting awareness of INNS issues

Organisation	Role and/or action	Delivery Mechanisms
LFT	<ul style="list-style-type: none"> - Promote awareness to general water users promoting the Biosecurity Plan and highlighting the dangers from INNS 	<ul style="list-style-type: none"> - Promote and launch of Biosecurity Plan -Distribute information leaflets to stakeholders and members of the public -Promote reporting system
Lochaber DSFB	<ul style="list-style-type: none"> -Continue to promote awareness to anglers and angling clubs of the dangers arising from INNS. 	<ul style="list-style-type: none"> -Continue to promote disinfection of equipment and provide appropriate facilities -Highlight potential risks of fish movements between catchments.
Highland Council	<ul style="list-style-type: none"> - Promote use of codes of best 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 	<ul style="list-style-type: none"> - Councils to promote codes of best practice at every opportunity e.g. including them with planning applications and building warrants - 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

Organisation	Role and/or action	Delivery Mechanisms
SEPA	<ul style="list-style-type: none"> - Clarify SEPA responsibilities for INNS to both staff and customers - Incorporate INNS issues into relevant guidance documents (as they are developed or updated) 	<ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> - 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

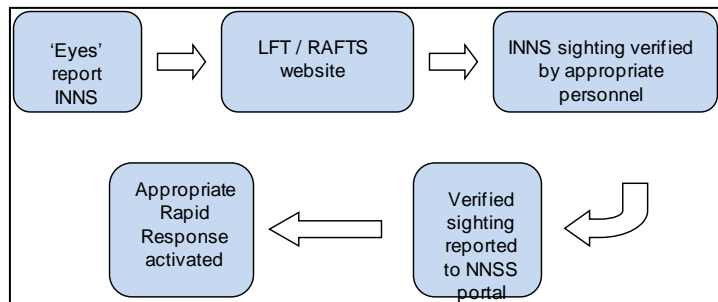
Objective 2: Develop systems to ensure the detection and surveillance of INNS and rapid response to the threat.

Key Actions

- A. Establish an ‘early warning system’ for detecting new threats
- B. Develop strategic monitoring of INNS in Lochaber
- B. Develop rapid response protocols for new significant threats to local biodiversity and economy

 **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 LFT or via the RAFTS website. 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 LFT Geographic Information System (GIS) database to monitor INNS distributions within the region.



 **Develop strategic monitoring of INNS in Lochaber.**

The LFT 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.

 **Establish rapid response mechanism for new high risk INNS**

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

Table 7. Response level for the invasive non native species

GB Response	High Priority Local Response	Priority Local Response
<i>Gyrodactylus salaris</i>	Giant hogweed	American Mink
Asian topmouth gudgeon	North American signal crayfish	Canadian pond weed
Ruddy duck	Australian swamp stonecrop	Nuttall's pond weed
<i>Didemnum</i> spp	Chinese mitten crab	Japanese knotweed
Water primrose	Slipper limpet	Himalayan balsam
	Zebra mussel	Rhododendron
	Common cord grass	Rainbow trout
	Wireweed	Minnow
	Fanwort	Red vent syndrome
	Large flowered waterweed	
	Floating pennywort	
	Escaped farm salmon	

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 species

GB Response	Local High Priority Response	Local Priority Response
-Report to local and GB institutions	-Report to local and GB institutions	-Report to local and GB institutions
-Determine the extent of infestation	-Determine the extent of infestation	-Determination of the extent of infestation
-Isolation of area where practicable	- Isolation of area where practicable	-Surveys in course of normal work to establish and map distribution
	Establish source and check related sites	-Inclusion of new areas in existing eradication/control programmes
	- Closure of all pathways	- Identification and closure all pathways
	-Decision on appropriate action eradication/containment.	- Monitor as part of planned catchment monitoring programme
	- Approved eradication methodology	
	-Monitor	





Objective 3: Develop effective control and eradication programmes for INNS present in Lochaber.

Key Actions

- A.** Collect data on distribution and abundance of existing threats
- B.** Develop and initiate control and eradication programmes to tackle threats
- C.** Coordinate partnerships with other organisations to source future funding and develop projects to ensure long-term control and eradication

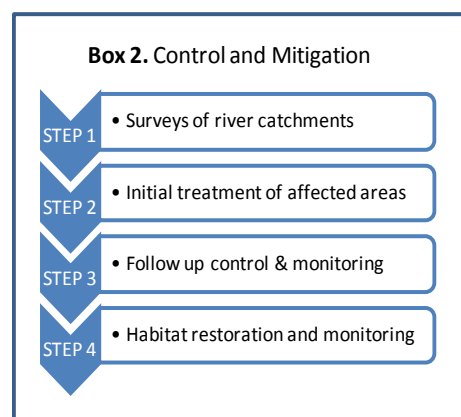
 **Collect data on distribution and abundance**

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:

-  LFT to modify existing habitat surveys to include presence and abundance of INNS;
-  Specific surveys for INNS are carried out to fully address the question of INNS within Lochaber;
-  Liaison with SNH, Highland Council, SEPA, local BSBI recorder and other groups to Standardise survey methods and combine current knowledge of distribution and abundance of existing INNS in Lochaber.
-  Enter data into LFT’s GIS database that will be regularly updated and readily shared with other agencies.

 **Develop and initiate control and eradication programmes**

As surveys reveal the distribution and extent of INNS in Lochaber, control and eradication programmes will be developed in conjunction with key stakeholders using up-to-date NNS advice on good practice for each INNS present. The LFT will liaise with the NNS for current good practice and with other RAFTS members on their practical experiences with control and eradication programmes. Control and eradication programmes will depend upon the nature of the INNS threat and different stakeholders will be involved in and lead different programmes depending on the threat. A combination of specialist contractors, volunteers, river managers, local estate staff and LFT staff forum will be used depending on the management requirements of the area involved.




Phase 1 of the control and eradication of non-native plants along Lochaber’s watercourses is already underway. The River Lochy Association and the Esmee Fairbairn Foundation have funded a three-year project targeting the extensive stands of knotweed along the banks of the River Lochy. Biannual spraying with glyphosate in the first two years of this project has already achieved significant reductions in the extent of knotweed and restricted the growth and spread of the largest

stands. It is anticipated that the situation will improve further in 2010, the final year of the project, but that eradication will not be achieved. To consolidate the benefits already seen and achieve long-term control of knotweed on the Lochy further spraying will be necessary in Phase 2 of the strategy.

Phase 2 of the control and eradication strategy is currently being developed and will build on the experience of knotweed control on the Lochy and other non-native plant control undertaken in the region. The scope of the project will be extended to cover the Lochy, Morar, Leven, Strontian, Hurich and Aline catchments and target Himalayan balsam as well as Japanese knotweed. The aim is to provide funding to train and equip local estate staff, fisheries managers and anglers to identify and eradicate through spraying any stands of these species within their catchments. Current knowledge of these catchments suggests that, aside from the Lochy, knotweed and balsam are present in small isolated stands that will all be included from the beginning of the project. Knotweed on the Lochy is more extensive and a phased approach beginning at the top of the catchment and systematically moving down the river will be required. Phase 2 will run for 5 years with funding being sought from the SEPA restoration fund and local fisheries interests.

By training local staff in the identification and treatment of non-native plants, Phase 2 will build long-term sustainability into the control and eradication of non-native plant species in Lochaber. The requirement for further formalised, phased projects will be assessed from the results of monitoring from Phase 2.

 Coordinate partnerships to source future funding and develop projects

Any progress made in the control of INNS can be quickly undermined and resources wasted if continued, long-term commitment is not present. There are many organisations with a remit and desire to control INNS. The LFT will seek to form and coordinate partnerships with these organisations and neighbouring fisheries trusts to identify funding sources and potential projects that ensure sustainable control of INNS in Lochaber. Such partnership working will be essential to bring about large-scale resource-intensive projects like the mink eradication programme that has been successful on Outer Hebrides. Existing structures including the Highland Invasive Species Forum and SEPA AAGs will be used to develop coalitions of the willing.

5.2 Actions and Timeframes

The table 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.

Action	Lead	Partners	TIMEFRAME								
			2010	2010	2011	2011	2012	2013	2014	2015	2016
Objective 1: Prevent the introduction and spread of INN species within the Cromarty Firth fisheries district.											
Launch of Lochaber Biosecurity plan through national and local press release	LFT	SEPA		—							
Produce leaflet on legislation including waste management & planning regulations	Highland Council	SNH, AAG		—	—						
Produce leaflet(s) on biosecurity issues and the reporting system	LFT /RAFTS	AAG, SNH		—							
Produce posters on biosecurity issues and distribute to the general public	RAFTS	LFT AAG Highland Council		.....	.....	.....	.....	.....	.....	.....
Continue to promote and install disinfection facilities for anglers at all angling proprietors fishing huts/parking points	LDSFB		.....	.....	.....	.....	.....	.....	.....	.....
Develop interim code of practice with Harbour Authority	Port Authorities	LFT		—	—						
Distribute Codes and posters to relevant retail outlets and clubs at open days and events such as agricultural shows	HISFI	LFT, AAG members		.....	.....	.....	.....	.....	.....	.....
Engage with Landowners and angling clubs to promote awareness of measures to tenants, resource – users, members and visitors	LFT LDSFB	SEPA, SNH		—	—						
Work with environmental groups and local schools to enhance awareness of INNS	LFT	SNH Highland Council Ranger Service		.....	.....	.....	.....	.....	.....	.....

Action	Lead	Partners	TIMEFRAME								
			2010	2010	2011	2011	2012	2013	2014	2015	2016
Objective 2: Establish framework for the detection and surveillance of INN species, linked to a protocol to ensure a rapid management response.											
Output 2.1 - 'Reporting system' established for INN species in Lochaber.											
Train LFT personnel in the identification of INNS	LFT /RAFTS			—————	—————						
Train LFT as trainers	LFT /RAFTS			—————							
Work with user and interest groups to identify "reporting network"	LFT	LDSFB Highland Council SNH AAG SEPA		—————	—————						
Training of "reporting network"	LFT	RAFTS LBAP SEPA		—————	—————	—	—	—	—	—	—
Establish, test and refine communication mechanisms within 'early warning' system	LFT Highland Council	RAFTS, SEPA (National)		—————							
Produce database to record and manage INNS sightings	RAFTS			—————							
Monitor and periodically evaluate efficacy of system	LFT & other partners			.....	.....	.....	.....	.....	.....	.....	.....
Output 2.2 – Develop strategic monitoring of INN species in district.											
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	LFT	SFCC/RAFTS SEPA Highland Council		.....	.....	.....	.....	.....	.....	.....	.....
Develop monitoring manual	SFCC	RAFTS SEPA (National)		—————							
Output 2.3 – Rapid response mechanism established for new INN species which pose significant threats to local biodiversity and economy.											
Formulate contingency plans for key species	RAFTS LFT	Highland Council, SEPA, SNH,		—————							
Identification of personnel for response teams	LFT SNH	Highland Council, SEPA		—————							
Training of personnel to execute contingency plans	LFT, SNH	Highland Council, SEPA		—————							

Action	Lead	Partners	TIMEFRAME								
			2010	2010	2011	2011	2012	2013	2014	2015	2016
Identification of funding resources	RAFTS, LFT	HISF AAG and SNH, RAFTS		.....	.....	.....	.....	.....	.....	.....
Refresher training	LFT	RAFTS, SNH					—	—	—	—	—
Monitor populations/treated areas	LFT	SNH, SEPA		.....	.....	.....	.....	.....	.....	.....
Objective 3: Develop coordinated control and eradication programmes for INNS											
Output 3.1- Collect data on the distribution and abundance of existing threats											
Initiate and complete catchment wide surveys by trained personnel	LFT	SFCC		—————	—————	—————	—————	—————			
Develop GIS database for recording and mapping INNS	LFT	SFCC, RAFTS, SEPA		——							
Objective 3.2 – Develop and initiate control and eradication programmes											
Phase 1 - continuation of knotweed control programme on Lochy	River Lochy Association	LFT Esmée Fairbairn Foundation SEPA ²⁸		——							
Implementation of Phase 2 of control/eradication programme for INNS plants	LFT/	SEPA ²⁹ Local volunteers RAFTS		- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -
Monitor the effectiveness of control programmes	LFT	SEPA		- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -
FRS monitoring of Notifiable fish diseases and red vent syndrome	MS			—————	—————	—————	—————	—————	—————	—————	—————
Objective 3.3 – Coordinate partnerships to source future funding and develop projects											
Complete draft Biosecurity plan	LFT			——							
Consultation with all stakeholders to agree Biosecurity plan	LFT			——							
Identify and develop opportunities for future funding of eradication projects	LFT	Highland Invasive Species Forum SEPA AAG FC SNH		- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -

²⁸ May be eligible for funding from the Restoration Fund

²⁹ As above

6. Monitoring

Biosecurity is being initiated within Lochaber by the LFT. It must be recognised that if current resources are not increased that progress will be limited. However, despite limitations, any work completed by the LFT will be monitored and the results evaluated particularly in the light of changing circumstances e.g. climate change. In this respect, the LFT will endeavor to evaluate its work and strategy on a 5-year basis.

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 fully 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 district
- 🌿 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 district and assessing them in terms of risk for the introduction of INNS.

A monitoring programme will be developed based on the agreed objectives and outputs of this plan. Monitoring activities will be undertaken by LFT staff in conjunction with stakeholder representatives who by virtue of their work are out in the catchment on a regular basis e.g. roads department and access officers employed by local councils.