



River Dee Biosecurity Plan

January 2010.



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.

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EXECUTIVE SUMMARY

This plan, prepared by the River Dee Trust (RDT), describes biosecurity issues for the Aberdeenshire River Dee District Salmon Fishery Board (DDSFB) area and presents actions that have been agreed with stakeholders for the prevention, early detection, control and mitigation of the introduction and spread of invasive non native species (INNS) and fish diseases. The vision of this plan is:

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

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

Objective 1: Reduce the INNS introduction risk within the Dee district.

Output 1.1: Key stakeholders aware of INNS impacts and measures required to prevent introduction and spread

Objective 2: Establish optimum surveillance, detection, monitoring and rapid response systems for identified INNS which pose significant threats to local biodiversity and economy.

Output 2.1 Establish early warning systems for surveillance, detection and monitoring of identified new species and those currently existing in the district






Output 2.2 Rapid response mechanism (RRM) established for identified species and functioning




Objective 3: Develop effective control and eradication programmes for identified existing INNS which are operational and sustainable.

Output 3.1 Effective, sustainable control/eradication programmes within the Dee district are established and fully functional for identified species

Output 3.2 Establish local groups to implement non-government actions specified within the Dee district Biosecurity Plan (DBP) under control of DDSFB/ RDT.

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

-  Prevention of the salmon parasite *Gyrodactylus salaris* from entering the district, avoiding catastrophic economic and environmental loss.
-  Conservation of important natural habitats for native species such as otter, Atlantic salmon, freshwater pearl mussel, European eel.
-  Maintain and enhance biodiversity – invasion by non native species is one of the top five drivers for global biodiversity loss and is increasing with globalisation and tourism.
-  Protection of endangered aquatic and riparian life from INNS predators such as American mink.
-  Control of expanding Grey squirrel populations, and protection of native Red squirrels from devastation by squirrel pox virus.

-  A holistic, cost effective control programme for INNS plants such as Giant hogweed, Japanese knotweed and Himalayan balsam will be established in partnership with key stakeholders.
-  Ensure INNS management is cost effective, strategic and sustainable.
-  Preventing entry of INNS species such as zebra mussel will help protect vital local businesses (e.g. potable water supply) from expensive mitigation measures.

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

ACTION	LEAD	PARTNERS	TIMEFRAME									
			2009	2010	2011	2012	2013	2014	2015	2016	2017	
Objective 1: Reduce the risk of introduction of new INNS within the Dee district.												
Output 1.1: Key stakeholders aware of INNS impacts and measures required to prevent introduction and spread												
Launch RDT Biosecurity plan both nationally and locally through press release	RDT			————								
Produce leaflet on legislation including waste management & planning regulations	AC*	SNH*, SEPA *		.....							
Produce leaflet on biosecurity risks and the reporting system	CNPA *, RDT	SNH, SEPA		————								
Produce posters on biosecurity risks and distribute to target groups and general public	RDT, CNPA	RAFTS*, SNH, SEPA, Plantlife		.....							
Continue to promote and install disinfection facilities for anglers at appropriate locations	DDSB/RDT		————	————	————	————	————	————	————	————	————	————
Develop interim code of practice with Aberdeen Harbour Authority	AHA*	RDT		.....							
Distribute codes and posters to relevant retail outlets and clubs, at open days and events such as agricultural shows	DDSF/ RDT; AC	SNH, SEPA		————	————	————	————	————	————	————	————	————
Engage with Landowners and angling clubs to promote awareness amongst tenants, resource –users, members and visitors through leaflets	RDT	SNH, SEPA, CNPA		.....							
Work with environmental groups and local schools to enhance awareness of INNS	RDT	SNH		————	————	————	————	————	————	————	————	————
Objective 2: Establish optimum surveillance, detection, monitoring and RRM for identified INNS posing significant threats to local biodiversity and economy												
Train RDT/ DDSFB personnel in the identification of INNS	RDT	SNH, RAFTS		.....							
Train RDT/ DDSFB as trainers	RDT	SNH, RAFTS		————								
Work with user and interest groups to identify and train “alien spotters”	RDT/ DDSFB	NESBReC*, SNH, CNPA, SEPA, DGG*		.....							
Produce database to record and manage INNS sightings	RDT	RAFTS, NESBReC		————								
Establish, test and refine communication mechanisms within surveillance system	RDT/ DDSFB	RAFTS		.....							
Monitor and periodically evaluate efficacy of surveillance system	RDT	RAFTS		————	————	————	————	————	————	————	————	————
Output 2.2 Rapid response mechanism (RRM) established and functioning.												
Formulate contingency plans	RDT/ DDSFB	AC, SEPA, SNH, CNPA		.....							

ACTION	LEAD	PARTNERS	TIMEFRAME								
			2009	2010	2011	2012	2013	2014	2015	2016	2017
Identification and training of personnel	RDT	AC, SEPA, SNH, CNPA, DGG		—	—						
Refresher training	RDT					—		—	—	—	—
Establish local communications systems	RDT	AC, SEPA, SNH, CNPA		.....						
Monitor riparian and aquatic habitats	RDT		—	—	—	—	—	—	—	—	—
Objective 3: Develop effective control and eradication programmes for existing INNS which are operational and sustainable.											
Output 3.1 Effective sustainable control/eradication programmes within the Dee District are established and fully functional											
Initiate and complete catchment INNS plant surveys by trained personnel	RDT	DDSFb	.....							
Establish "upper limit" removal programme of INNS plants	RDT/ DDSFB	SNH, SEPA, Landowners		—	—	—	—	—	—	—	—
Remove aquatic INNS plants from vulnerable spawning habitat and pearl mussel beds	RDT/ DDSFB	SNH, SEPA, Landowners		—	—	—	—	—	—	—	—
Continue catchment wide raft surveys and control of American mink	Mink Project, RDT	DDSFb, DGG, AU*, RAFTS, Landowners		—	—	—	—	—	—	—	—
Expand monitoring and trapping programme for Grey squirrels	SWT	DGG, DDSFB/ RDT		—	—	—	—	—	—	—	—
Continue monitoring for presence of American signal crayfish	RDT	DDSFb, DGG, Landowners		—	—	—	—	—	—	—	—
Continue fish monitoring programme to detect INNS impacts	RDT	MS*	—	—	—	—	—	—	—	—	—
Establish local and national GIS database for recording and mapping INNS	RDT, RAFTS, NESBReC	DGG, volunteers		—	—						
Monitor the effectiveness of control programmes	RDT		—	—	—	—	—	—	—	—	—
MS monitoring of disease and parasite outbreaks in district	MS	RDT/ DDSFB, DGG	—	—	—	—	—	—	—	—	—
Output 3.2 Establish local groups to implement non-government actions specified within the Dee District Biosecurity Plan under control of DDSFB/ RDT.											
Complete draft biosecurity plan	RDT		—	—							
Consult with all stakeholders to agree biosecurity plan	RDT	All	—	—							
Consult with representatives from all stakeholder groups to form Dee Biosecurity Group	RDT	All		—	—	—					

*AC- Aberdeenshire Council.

*AHA- Aberdeen Harbour Authority.

*AU- Aberdeen University.

*CNPA- Cairngorms National Park Authority.

*DGG- Dee Ghillies Group.

*MS- Marine Scotland.

*NESBReC- North East of Scotland Biological Recording Centre.

*RAFTS- River and Fishery Trusts of Scotland.

*SNH- Scottish Natural Heritage

*SEPA- Scottish Environmental Protection Agency.

*SWT- Scottish Wildlife Trust.

SECTION 1 PURPOSE AND SCOPE

This plan describes biosecurity issues in the Aberdeenshire River Dee district and presents actions agreed with stakeholders for the prevention, early detection, control and mitigation of the introduction and spread of identified INNS. The vision of this plan is:

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

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

Objective 1: Reduce the risk of INNS introduction within the Dee district.

Objective 2: Establish optimum surveillance, detection, monitoring and rapid response mechanisms for identified INNS which pose significant threats to local biodiversity and the economy

Objective 3: Develop effective control and eradication programmes for existing INNS which 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 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 agreed actions.

The ultimate key to the plan’s effectiveness is building 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:

- 🌿 Prevention of the salmon parasite *Gyrodactylus salaris* from entering the district, avoiding catastrophic economic and environmental loss.
- 🌿 Conservation of important natural habitats for native species such as otter, Atlantic salmon, freshwater pearl mussel, European eel.
- 🌿 Maintain and enhance biodiversity – invasion by non native species is one of the top five drivers for global biodiversity loss and is increasing with globalisation and tourism.
- 🌿 Protection of endangered aquatic and riparian life from predation by American mink.
- 🌿 Control of expanding Grey squirrel populations, and protection of native Red squirrels from devastation by squirrel pox virus.

¹ www.nonnativespecies.org

- 🌿 A holistic, cost effective control programme for INNS plants such as Giant hogweed, Japanese knotweed and Himalayan balsam will be established in partnership with key stakeholders.
- 🌿 Ensure INNS management in the district is cost effective, strategic and sustainable.
- 🌿 Preventing entry of INNS species such as zebra mussel will help protect vital local businesses (e.g. potable water supply) from expensive mitigation measures.

SECTION 2 BACKGROUND

This RDT prepared plan is one of 20 biosecurity plans being produced throughout Scotland as part of a national programme of action implemented through RAFTS with backing and support from the Scottish Government, SNH, SEPA and the Esmeé Fairbairn Foundation.

RDT is a registered Scottish Charity with the following objectives:

- 🌿 Monitoring health of fish populations and providing scientific advice on management of fish stocks.
- 🌿 Practical restoration of riparian and aquatic ecosystems.
- 🌿 Providing education on environmental and fish related topics to groups and individuals.

In supporting its role of protecting, rehabilitating and enhancing aquatic and riparian environments, RDT considers the preparation and implementation of this biosecurity plan as an essential component of a programme of survey and control of INNS in the area. Invasive species and their impacts are highlighted in the Dee Catchment Management Plan ([Dee Catchment Management Plan](#)²), which has several Action Cards devoted to their management.

The need for action on biosecurity issues has been identified in the Trust's [Aberdeenshire Dee and District Fisheries Management Plan](#)³, being prepared as part of the [River Basin Management Plan](#)⁴ for the Scotland River Basin District. 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 into the next generation plan. Although this plan is not a legal instrument in itself it utilises existing legal and regulatory instruments to support implementation of actions and in pursuance of its objectives. As such the successful implementation of this plan will rely on 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 RDT 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 actions required to address the complex issues associated with biosecurity. This plan therefore represents the agreed approach of

² <http://www.theriverdee.org/>

³ <http://www.riverdee.org.uk/publications&policies/publications.asp>

⁴ http://www.sepa.org.uk/water/river_basin_planning.aspx

RDT/ DDSFB, stakeholders and appropriate regulatory agencies in the Dee district for prevention, early detection and control of INNS, fish diseases and parasites.

SECTION 3 THE CONTEXT

3.1 Biosecurity: The Nature of the Problem


Biosecurity issues are of increasing economic and ecological significance. Globalisation has expanded the extent and complexity of world trade, and growth of the tourism market has expanded the number of destinations for activity holidays and travellers. This is particularly true in the Dee district, with large numbers of anglers visiting from overseas every year. These trends have led to the increased probability of intentional and unintentional introduction, establishment and spread of INNS, parasites and diseases in Scotland and the UK. In the context of this plan, biosecurity issues in Scottish rivers and lochs are considered in relation to the potential introduction and spread of a priority list of INNS and fish diseases.

According to a [survey](#)⁵ commissioned by SNH in 2001, there are approximately 1000 non-native species currently 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 are those that have been transported outside their natural range and that damage our environment, the economy, our health and the way we live.

Invasive non native species are the second greatest threat to biodiversity, being capable of rapidly colonising a wide range of habitats and excluding native flora and fauna ([CBD, 2006](#)⁶). Furthermore, over the last 400 years INNS have contributed to 40% of animal extinctions where the cause 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 their introduction, spread and impact. Ecological changes wrought by INNS can further threaten already endangered native species and reduce natural productivity and amenity value of riverbanks, shorelines and water bodies.

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](#) have estimated that INNS cost the UK economy at least £2 billion per year

⁵ www.snh.org.uk/pdfs/publications/review/139.pdf

⁶ <http://www.cbd.int/gbo2/>

- 🌿 In the UK, Japanese Knotweed is thought to affect an area roughly the size of London and a report of the [Review of Non-Native Species Policy \(2003\)](#)⁷ has estimated the total cost of its removal using current techniques at £1.56bn.
- 🌿 A Scottish Government [report](#)⁸ 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](#)⁹ estimates the current cost of clearing 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 water bodies in Scotland, reducing the amenity value of those areas.

There is also a growing recognition of the impacts of **translocated species**. Translocated species are those native to Great Britain that have been transported outside their natural range. They can have severe ecological impacts. Examples of translocated species that are impacting the ecology of Scotland's waters are Minnow (*Phoxinus phoxinus*) and Ruffe (*Gymnocephalus cernuus*). Translocated species were originally introduced for a variety of reasons, ranging from those escaping from environments where they have been stocked as ornamentals to deliberate introduction for angling or aquaculture.

Without a coordinated, systematic approach to preventing introduction and spread of INNS, it is likely that the ecological, social and economic impacts will continue to increase, as will costs for mitigation, control and eradication. This plan attempts to set out and implement such an approach at a local level for [selected species](#)¹⁰ that significantly impact riparian and aquatic environments. This 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 of mitigation, control and eradication of INNS once established, this plan emphasises the need for preventing introduction, and rapid response **before** they become established. Furthermore, the host of entry pathways and the persistence of many INNS make a partnership approach to prevent introductions and involve stakeholders essential for success. The partnership approach encapsulated in this plan is a key requirement for increased public awareness and engagement, optimisation of resources and provision of clear guidance for inter-agency working necessary to address biosecurity issues in the district. These approaches are consistent with the [GB Invasive Non Native Species Framework Strategy](#)¹¹ and the [Species Action Framework](#)¹² both of which have been approved by Scottish Government.

⁷ <http://www.defra.gov.uk/wildlife-countryside/pdf/wildlife-manage/non-native/review-report.pdf>

⁸ www.scotland.gov.uk/resource/doc/1062/0042434.pdf

⁹ [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)

¹⁰ www.invasivespeciesscotland.org.uk

¹¹ www.nonnativespecies.org

¹² www.sng.org.uk/speciesactionframework

Actions presented in this plan will 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 \(1981\)](#)¹³ makes it an offence to allow any animal (including hybrids) not ordinarily resident in Great Britain, to escape into the wild, or to release it into the wild; or to release or allow to escape from captivity, any animals that is listed on Schedule 9 to the 1981 Act. It is also an offence to plant or otherwise cause to grow in the wild any plant listed on Schedule 9 to the 1981 Act.
- 🌿 Local Authorities have powers to take action against Giant hogweed (*Heracleum mantegazzianum*) where it is considered a statutory nuisance.
- 🌿 Section 179 of the [Town and Country Planning \(Scotland\) Act 1997](#)¹⁴ 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](#)¹⁵ regulates the use of pesticides and herbicides for control and eradication of INNS.
- 🌿 [Environmental Protection Act 1990](#)¹⁶ 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 discarded plant material is likely to be classified as controlled waste. This means that offences exist with the deposition, treating, keeping or disposing of controlled waste without a licence.
- 🌿 [The Waste Management Licensing Regulations 1994](#)¹⁷ define 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](#)¹⁸ and the [Environmental Protection \(Duty of Care\) Regulations 1991](#)¹⁹ provide guidance for handling and transfer of controlled waste.

The procedures for detection, notification and control of fish diseases procedures are already well defined by fisheries legislation. This stipulates that Marine Scotland (MS) acts on behalf of Government in response to the occurrence or suspicion 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 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 these existing plans (see also Table 1):

¹³ www.opsi.gov.uk/RevisedStatutes/Acts/ukpga/1981/cukpga_19810069_en_1

¹⁴ www.opsi.gov.uk/acts/acts1997/ukpga_19970008_en_1

¹⁵ www.opsi.gov.uk/legislation/scotland/ssi2005/20050066.htm

¹⁶ www.opsi.gov.uk/acts/acts1990/ukpga_19900043_en_1

¹⁷ http://www.opsi.gov.uk/si/si1994/uksi_19941056_en_1.htm

¹⁸ www.opsi.gov.uk/si/si1991/uksi_19911624_en_1.htm

¹⁹ www.opsi.gov.uk/si/si1991/uksi_19912839_en_1.htm

- the Aberdeenshire Dee & District Fisheries Management Plan,
- the River Basin District Management Plan,
- the Dee Catchment Management Plan (in preparation),
- the North East of Scotland Local Biodiversity Action Plans,
- the Cairngorms National Park Biodiversity Action Plan.

Furthermore, this plan supports the objectives of the Special Area of Conservation designation for the River Dee to protect Atlantic salmon, otters and freshwater pearl mussels.

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

Provision or Requirement of Existing Plan	Action in Biosecurity Plan
The Scotland River Basin Management Plan ²⁰ Biosecurity planning has been omitted from the draft.	The RDT Biosecurity Plan will be included in programme of measures
Aberdeenshire Dee and District Fisheries Management Plan ²¹ Highlighted <ul style="list-style-type: none"> ▪ The threat from known INNS, the distribution of those already present ▪ The need for cross-agency action ▪ Actions being carried out 	This biosecurity plan expands the scope of biosecurity planning and the other identified biosecurity measures in the Fisheries Management Plan
Gyrodactylus salaris (Gs) Contingency Plan : ²² 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 as well as formulate rapid response protocols for “new” INNS which pose significant threats to local species and biodiversity
North East of Scotland Biodiversity Action Plan ²³ Acknowledges the threat from non-native species but only highlights those already present in the area	This plan puts forward a programme for eradication of existing species, preventative measures to curtail new introductions and development of a rapid response aimed at eradication of any new introductions if they do occur
Cairngorms National Biodiversity Action Plan : ²⁴ Promotes the conservation of water voles through mink eradication schemes	Measures for (awareness, monitoring and trapping) the eradication of mink within the district are already in place and are continued in this plan
Plans supporting designated conservation areas (SACs and SSSIs). Scotland’s Biodiversity: A strategy for the conservation and enhancement of biodiversity in Scotland. ²⁵	Supports the conservation of biodiversity target species through the control and eradication of INNS detrimental to their ecology

SECTION 4 BIOSECURITY ISSUES IN THE DEE DISTRICT

4.1 Description of the Dee Area

There are three river catchments within the DDSFB district: River Dee, Cowie Water and Carron Water. RDT operates in the same area as that covered by the DDSFB. There are at least 22

²⁰ www.sepa.org.uk/water/river_basin_planning.aspx

²¹ www.rafts.org.uk/projects/fisheriesmanagementplanning.asp

²² www.scotland.gov.uk/Topics/Fisheries/Fish-Shellfish/18610/diseases/g-salaris/GsCGrev

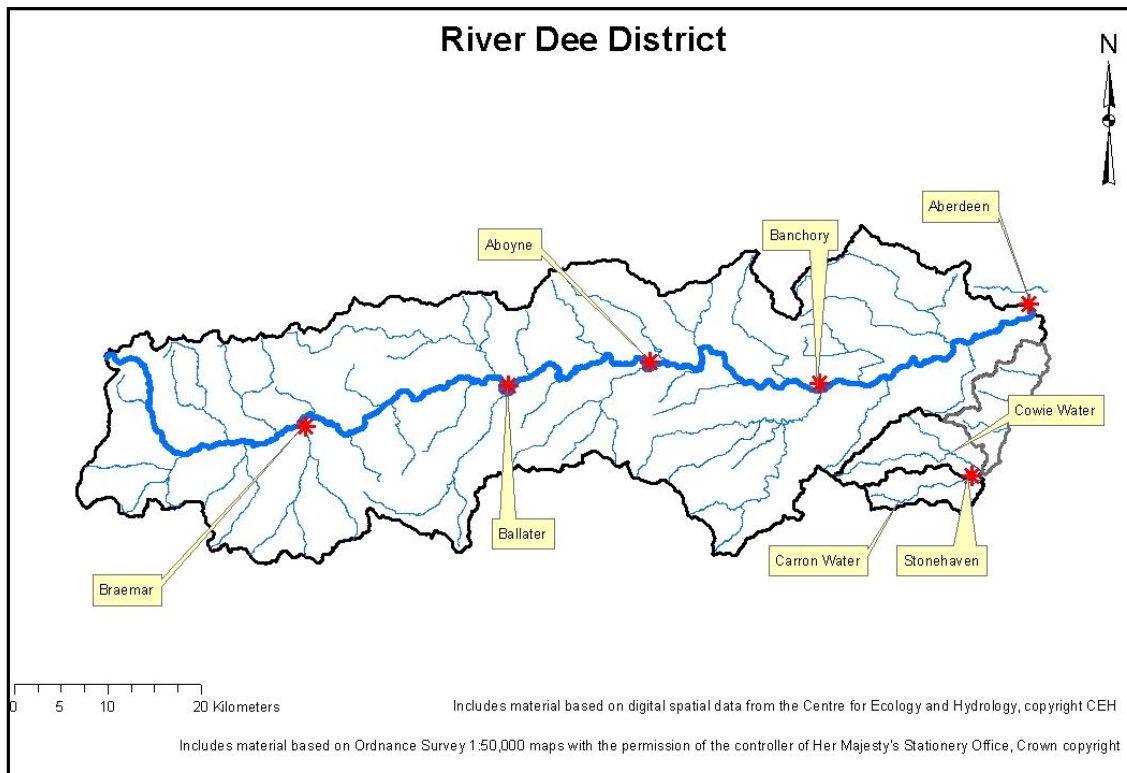
²³ www.ukbap.org.uk/lbap.aspx?ID=431

²⁴ www.ukbap.org.uk/lbap.aspx?ID=360

²⁵ www.scotland.gov.uk/Publications/2004/05/19366/37239

protected species as well as 13 focus species for Local Biodiversity Action Plans (Table 2) known to be present in the area.

The River Dee is approximately 135 kilometres long. It rises on Braeriach as the Wells of Dee at an altitude of 1220 metres, entering the sea at Aberdeen. Maximum altitude within the catchment is 1309 metres (Ben MacDui). 56.3% of the catchment lies above the 300 metre contour line. The catchment is generally very hilly and steep, with many tributaries moving through classic post-glacial valleys.



The Cowie Water is approximately 20 kilometres long. It rises on the Hill of Roughbank at an altitude of 330 metres, entering the sea at Stonehaven. The catchment's highest point is Leachie Hill, at 396 metres. Although hilly, this smaller and more coastal catchment is more low-lying than the Dee, with only 10% above the 300 metre contour. Highest ground is in the western reaches and the north-western edge, adjoining the Dee catchment. The river and its tributaries often flow through narrow, steep-sided valleys.

The Carron Water is approximately 15 kilometres long. It rises on the Hill of Bogjurgan at an altitude of approximately 250 metres above sea level, entering the sea at Stonehaven. The Hill of Trusta (321 metres) is the highest point. The catchment is much lower than both the others, with only 0.7% lying above 300 metres. Although lower than the others, the hills in the north-western corner are steep and, as with the Cowie, the river and tributaries have often cut narrow, steep-sided valleys.

4.2 Use of Catchment

Moorland and rough pasture dominates the Dee catchment. There is improved grassland along valley floors of most tributaries and the upper Dee. There are substantial areas of commercial coniferous forestry plantation, mainly along valley floors in the upper catchment but on higher ground and moorland edges further downstream. The lower catchment is dominated by arable ground and improved grassland, penetrating further upstream on the north side than south, with quite a lot of commercial coniferous plantation. There are numerous, generally small, blocks of mainly semi-natural broadleaved woodland, particularly in central areas (Table 2).

Commercial forestry plantations dominate the Cowie catchment. There are substantial areas of moorland and the remainder of the catchment is mainly arable agriculture and improved grassland. There are several blocks of broadleaved woodland, generally small in extent (Table 2).

Land use in the Carron catchment is dominated by arable agriculture and improved grassland. There are significant areas of commercial coniferous plantation, with one very large block. There is one small area of moorland and several fairly small blocks of broadleaved woodland (Table 2).

There are numerous types of land use and businesses throughout the district, from large scale (agriculture, forestry, tourism, industry (e.g. oil supply)) to other commercial interests (e.g. quarries, fishing ports and harbours, garden centres, pet shops, sawmills, distilleries, hospitals and drinking water suppliers). Most industry is in or near Aberdeen, but there are industrial estates in most rural towns.

Table 2: Land Use Categories			
Landuse	Dee	Cowie	Carron
Heather moorland	32	10.5	
Coniferous forest	11.6	34.4	30.2
Recent forestry planting		11.5	
Mixed woodland			2.7
Other mosaics	11		
Improved grassland	10.1	10.6	36.2
Arable	10	12.6	10
Good rough grassland	8.7	11.5	12.2
Heather moorland		10.5	
Urban			5
Other land uses	16.6	9	3.7

Business directly linked with the sport of angling is an important local economic driver and is one of the main, but not the only, sector this plan seeks to enhance and protect. Other activities including walking, golf, bird watching, canoeing, shooting and wild fowling rely in part upon the quality of the aquatic and riparian environments. A recent [survey](#)²⁶ of [the economic impact of game and coarse angling in Scotland](#)²⁷ commissioned by the Scottish Executive revealed that angling is extremely important to Scotland's economy, particularly in rural areas with anglers spending about £113M annually (see Table 3 for North East Scotland Data). When substitution effects are taken into account, this produces an estimated £100M of output in the Scottish economy, and supports around 2,800 full time job equivalents. In addition to fishery proprietors, many businesses such as hotels, guest houses, restaurants and tackle shops are to a greater or lesser extent dependent upon angling for their continued trade. Angling is mainly focused on salmon and sea trout but there are increasing numbers of put-and-take angling developments based on artificially stocked rainbow trout ponds, and small but active coarse fishing interests (mainly for pike). The salmon and sea trout fishery within the River Dee is estimated to generate around £12M annually and support 500 jobs.

Table 3 Angler expenditure table (£ 000s) for North East Scotland (Aberdeenshire, Angus and Tayside)

Fishery	Value (£ 000s)
Salmon & sea trout	£24,344
Brown trout	£1,589
Rainbow trout	£4,910
Coarse fish	£824
Total	£31,667

4.3 Biosecurity – current and potential threats

Thirty one INNS and fish diseases have been included in the RDT Biosecurity Plan of which twenty high priority species will be the main focus for action. These high priority species were identified as those that:

- 🌿 Already exist within the Dee district,
- 🌿 If introduced would have severe consequences for local biodiversity and economy; and/or
- 🌿 Have a high risk of introduction due to nature of transport pathways and their current geographic proximity.

4.3.1 Current biosecurity issues

Current biosecurity issues in the Dee district are associated with nine INNS and two translocated native species:

- 🌿 American mink (*Mustela vison*) is present throughout the district, but has nearly been eradicated from the western catchment by a sustained trapping programme. Mink prey on water fowl, small mammals and fish. They have a very serious impact when populations of one prey are at low levels, as they can switch to other prey but remain in the area and continue to exploit the threatened species as the opportunity arises. Mink are linked to the decline of

²⁶ <http://www.scotland.gov.uk/Publications/2004/06/19506/38879>

²⁷ <http://www.scotland.gov.uk/Publications/2004/03/19079/34369>

water voles (*Arvicola amphibious*, formerly called *A. terrestris*) in the Cairngorms National Park area with 94% of sites occupied by water voles in the 1950s are now unoccupied.

- 🌿 Water crowfoot (*Ranunculus sp. hybrid*) is native to Britain but not northern Scotland. It has been translocated to the Dee and is present in the middle and lower reaches, becoming very dense and prolific in some areas downstream of Banchory. Dense stands have overwhelmed the stream bed, accumulating sediment and in some areas impacting freshwater pearl mussel beds and salmonid spawning gravels. Growth can be so dense it impacts on anglers, both by changing holding area for fish and by entangling lines and hooks, or fish that are caught. It spreads by natural seed and vegetative dispersal (particularly after cutting) and can accumulate metal loads within water bodies. Being outside its natural range, no aquatic invertebrates are currently associated with *Ranunculus* in the Dee.
- 🌿 Canadian pondweed (*Elodea canadensis*) and Nuttall's pondweed (*Elodea nuttallii*) are present in various locations throughout the Dee district. They spread by disposal of plants or plant fragments near waterways, escapes from garden ponds during flood episodes and possibly by birds and other animals. They can dominate native macrophyte communities, which can lead to their extinction and thereby impacts local invertebrate communities. They can increase metal loads within water bodies, compounding impacts on native flora and fauna.
- 🌿 Rhododendron (*Rhododendron ponticum & hybrids*) is present in a few locations in the middle and lower Dee district. It spreads by natural seed and vegetative dispersal after intentional planting in gardens, parks and demesnes. It forms dense thickets and out-competes native plants for space and resources with impacts on fish and invertebrate communities as well as preventing site access.
- 🌿 Japanese knotweed (*Fallopia japonica*) is localised in small pockets in the Dee catchment, from just above Ballater downstream. There are dense stands in the lower Cowie catchment around Stonehaven and localised pockets in the lower Carron. It has spread along rivers by movement of plant fragments by water and is found in many other areas through the movement of plant debris in soil and on vehicles. It forms dense thickets which can exclude native plants and prohibit regeneration. Dense stands can also hinder access, reduce biodiversity and alter the habitat for wildlife. Winter dieback of the plants exposes soil to erosion.
- 🌿 Himalayan balsam (*Impatiens glandulifera*) is present in scattered populations throughout the Dee district below Dinnet. It spreads through natural dispersion by wind or water from areas in which it has been planted or introduced through the transport of contaminated soil. It forms thick monospecific stands that can shade out low level native plants reducing biodiversity and denuding river banks of understory vegetation. Winter dieback of the plants exposes soil to erosion.
- 🌿 Giant hogweed (*Herculeum mantegazzianum*) is present as individual plants and localised small groups in the Dee and Cowie catchments. A denser population is present in the Carron on the outskirts of Stonehaven. It spreads through seed dispersal, sometimes by birds, and movement of soil contaminated by seeds. It is a public health hazard due to the toxins in the sap reacting

with UV light to blister skin. Dense stands can hinder access. Giant hogweed out-competes native vegetation for space and resources, and can result in a loss of plant and invertebrate diversity. Winter dieback exposes soil to erosion with loss of river banks and increased sedimentation.

- 🌿 Rainbow trout (*Oncorhynchus mykiss*) and variants have been introduced to commercial and angling club fishing ponds throughout the district. Escapees have been caught by anglers in the vicinity of some of these ponds. Escaped fish are a potential source of viral and bacterial diseases affecting wild fish, and they compete for resources with native species.
- 🌿 Minnow (*Phoxinus phoxinus*) is a translocated species that has been introduced throughout the district by anglers. Minnows compete for food and territory with native species, but they also provide another food resource for kingfishers, herons, sawbill ducks and other, larger fish species. Minnows have been caught in all catchments where angling occurs within the district.
- 🌿 Grey squirrels (*Sciurus carolinensis*) were introduced from America in the late nineteenth or early twentieth century. They are bigger and more aggressive than native Red squirrels (*Sciurus vulgaris*) and out-compete them in mixed woodlands, particularly when oak is common. Red squirrels are becoming more fragmented in distribution and much more restricted to coniferous woodland. In the 1980's there was the first outbreak of [squirrel pox virus](#)²⁸ in England. This disease is carried by Greys, which are unaffected by it, but is fatal to Red squirrels. So far there have been no outbreaks of squirrel pox virus in Scotland. Grey squirrels have been introduced to Aberdeen and have spread along riparian corridors both through natural migration and reportedly by humans trapping and moving them.

4.3.2 Potential Biosecurity Issues

The INNS listed below are not currently present within the Dee district (Tables 4 and 5). They have been classified as High or Medium level threats, depending on their likely impact on the local economy and biodiversity in combination with likelihood of introduction. Level of introduction risk was based on introduction pathways for the INNS, their current geographic proximity and land uses within the Dee district.

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

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

There are five High Threat species that could be introduced into the district, including the fish parasite *Gyrodactylus salaris*, three freshwater invertebrates and two aquatic plant species (Table 4).

²⁸ <http://northernredsquirrels.org.uk/pox.htm>

Table 4 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 or ballast water 	<ul style="list-style-type: none"> Projected catastrophic impact on salmon (<i>Salmo salar</i>) populations throughout Scotland. (It has largely exterminated <i>S. salar</i> in 41 Norwegian rivers)
North American signal crayfish (<i>Pacifastacus leniusculus</i>)	High - Through intentional/ unintentional introduction from an existing population nearby	<ul style="list-style-type: none"> Burrows into river banks causing destabilisation Diet include small fish, fish ova and invertebrates Lives at very high densities, overwhelms local ecology
Australian swamp stonecrop (<i>Crassula helmsii</i>)	High – Through introduction from two existing populations nearby. Other pathways include: <ul style="list-style-type: none"> Garden trade²⁹ Disposal of garden waste Spread by animals and human activity 	<ul style="list-style-type: none"> Suited to a wide range of slow moving freshwater systems. Out competes native species. Forms dense carpets choking ponds and ditches. Reduced light levels below dense growths can cause die off of waterweeds and algae and reduce water oxygen levels
Zebra mussel (<i>Dreissena polymorpha</i>) Freshwater Bivalve	Medium -through unintentional introduction from contaminated boat 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 screens 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 known to infect humans
Curly waterweed (<i>Lagarosiphon major</i>)	Medium – found in a small number of locations throughout Scotland especially in the central belt area and spread through: <ul style="list-style-type: none"> Disposal of garden waste Animals and human activity Fragmentation by wind dispersal, boat movement, angling equipment and possibly water fowl 	<ul style="list-style-type: none"> Capable of forming very dense infestations in suitable habitats, occupying full water column in waters up to 6m deep with significant impacts on native plants, insects and fish. A serious threat to tourism, angling, boating and other recreational pursuits as well as conservation goals

There are also 15 Medium Threat level species of which there is a high risk of introduction for two species, a medium risk for eight species and a low risk for five species (see Table 5 below).

Table 5 The risk of introduction of Medium Threat level INNS.

SPECIES	RISK OF INTRODUCTION
Ruddy duck (<i>Oxyura jamaicensis</i>) Orfe (<i>Leuciscus idus</i>)	High High Could migrate from a number of locations in eastern Scotland Through intentional/unintentional introduction from an existing population nearby.
Water primrose (<i>Ludwigia grandiflora</i>) Water fern (<i>Azolla filiculoides</i>)	Medium Medium Unintentional introduction from boat hulls and ponds Through intentional/unintentional introduction from numerous locations throughout Scotland, especially central belt
Slipper limpet (<i>Crepidula fornicate</i>) Didemnum Tunicates / sea squirts (<i>Didemnum vexillum</i>)	Medium Medium Unintentional introduction from boat hulls Unintentional introduction from marine fishing boat hulls
Wireweed (<i>Sargassum muticum</i>) Ruffe (<i>Gymnocephalus cernuus</i>)	Medium Medium Unintentional introduction from marine fishing boat hulls Currently recorded in central Scotland and could be introduced as live bait or in ballast water

²⁹ Note that although the sale of species that are or can become invasive is not illegal, garden centres should be made aware of the impacts of known or potential INNS if they are released into the wild.

Bullhead (<i>Cottus gobio</i>)	Medium	Translocated species recorded in central Scotland that could be introduced deliberately or as live bait
Common cord grass (<i>Spartina anglica</i>)	Medium	One location near St Andrews
Large flowered waterweed (<i>Egeria densa</i>)	Low	Only found to date in East Lothian. Possible introduction from ponds
Floating pennywort (<i>Hydrocotyle ranunculoides</i>)	Low	Currently only in England up to the midlands. Possible introduction from ponds
Parrot's feather (<i>Myriophyllum aquaticum</i>)	Low	Through intentional/unintentional introduction from two existing populations in the south of Scotland
Fanwort (<i>Cabomba caroliniana</i>)	Low	Only found in one location in southern Scotland possible introduction from ponds
Asian topmouth gudgeon (<i>Pseudorasbora parva</i>)	Low	Currently only recorded from 5 locations in England. Could be introduced as live bait, in ballast water or as releases from aquaria

From Tables 4 & 5, the main pathways or means of introduction of both High and Medium Threat level species into the Dee district catchments are:

- 🌿 Intentional introduction, release or planting
- 🌿 Fouling and ballast water of marine vessels
- 🌿 Fouling and ballast water of freshwater vessels
- 🌿 Escapes from fish farms, ponds, gardens, demesnes
- 🌿 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.

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

The engagement of key stakeholders is imperative for the success of this plan. Regulatory agencies and bodies associated with other relevant management plans include the:

- 🌿 Aberdeen and North East Scotland SEPA office
 - North East of Scotland Area Advisory Groups
- 🌿 Aberdeenshire Council
- 🌿 Cairngorms National Park and North East Local Biodiversity Action Groups
- 🌿 Cairngorms National Park Authority
- 🌿 Dee District Salmon Fisheries Board
- 🌿 River Dee Trust
- 🌿 Forestry Commission, Monymusk
- 🌿 Scottish Government, Edinburgh
- 🌿 Scottish Natural Heritage (SNH) and Aberdeenshire Area Offices
- 🌿 Scottish Wildlife Trust (SWT), Edinburgh

Other groups that are also important for the prevention of introduction and spread of INNS were identified from an analysis of the pathways presented in Table 6.




Table 6 Pathways and stakeholders in the Dee district

Pathway	Stakeholders
Intentional introduction, release or planting	AC and Planning department; SNH; SWT; DDSFB/ RDT; Grampian Police
Fouling and ballast water of marine vessels	AHA; SEPA
Fouling and ballast water of freshwater vessels	AHA; SEPA; UK Government; local canoe and water sports organisations
Sale from garden or pond centres	Horticultural Trade Association; Ornamental Fish Producers
Contaminated water (sports equipment e.g. from anglers, canoeists) and as a medium for live fish transport	DDSFB; MS
Escapes from fish farms, ponds, gardens, desmesnes.	MS; SEPA; Planning Authorities; SNH; Plantlife; landowners; members of the public; angling clubs
Movement of contaminated soils or vehicles	AC; SEPA; quarries; building contractors
Improper control and disposal measures e.g. cutting and dumping without treatment	AC; SEPA; environmental health; Plantlife; landowners; 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.

SECTION 5 BIOSECURITY MANAGEMENT STRATEGY

The plan’s objectives will be achieved through a partnership approach to implement the following strategic elements:

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

5.1 Objectives and Outputs

This section describes expected outputs from implementation of the three plan objectives and actions required for their realisation. Agreed actions for **prevention** are focussed on disruption of pathways for introduction and spread of INNS, translocated species and fish diseases. They include a mixture of awareness raising and practical measures. Awareness activities take note of the GB Awareness and Communication Strategy. **Early detection** of introduction or spread of INNS will be achieved through surveys to locate existing populations, establishing a coordinated local surveillance and recording system, supported by routine **monitoring** of established native populations that may be affected by introduction, and at risk areas.

Objective 1: Reduce the INNS introduction risk within the district.

Output 1.1: Key stakeholders aware of impacts and measures required to prevent introduction and spread.

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

- 🌿 INNS damage our environment, economy, our health and the way we live.
- 🌿 We require the support of stakeholders to increase awareness and understanding of INNS issues and impacts.
- 🌿 INNS:
 - Threaten our native plants, animals and habitats.
 - Estimated to cost the British economy between £2 and £6 billion pounds each year.
 - Can threaten our health.

Local priorities for awareness will focus on disrupting pathways for introduction and spread of INNS in the district. Key stakeholders, identified areas of priority and proposed mechanisms for delivery are presented in Table 7 below. The roles and actions of key government agencies and non government bodies in promoting awareness of INNS issues are presented in Table 8.

Table 7 Proposed priority areas for awareness and delivery mechanisms according to stakeholder group

Stakeholder Group	Priority Area	Mechanism of Delivery
Aberdeen Harbour Authority	- Avoid pumping out non sterilised ballast water in harbour - Role of hull fouling in the introduction and spread of INNS	- Formulate and implement an interim code of practice requiring non-sterilised ballast water to be discharged on the ebb tide and away from harbour area. -RDT to assist with the supply of posters and other awareness material for display and signage. -Invasive Species Scotland ³⁰ website
Local Garden Centres	-Distribution of codes of practice covering the security and disposal of INNS to all garden centres -Target gardeners to dispose plant material and/or soils in a responsible manner.	RDT to work with garden centres to encourage distribution of codes and posters (available from Plantlife) and to advise the general public of INNS issues
Local Aquarium and Pond stockists	-Promote code of practice to all pet shops and suppliers of ornamental fish -Target aquarists and pond keepers to dispose of unwanted animals or plants in a responsible manner	-RDT to work with retailers to encourage distribution of codes and posters (available from Plantlife)
Scottish Wildlife Trust	-Raise awareness of the impact of Grey squirrels -Stop spread into and within the district - Identification of suitable persons to act as “alien spotters” -Eliminate Greys outside Aberdeen city	-Presentations and promotional material -Establish distribution, then trapping -Work with DDSFB/RDT and DGG -Implement Scottish Strategy for Red squirrel Conservation ³¹
Water User associations (canoeists, sailing clubs)	-Promote awareness to clubs and participants of the dangers arising from INNS and Gs -Identification of suitable persons to act as “alien spotters”	-RDT to work with associations to promote disinfection of equipment and provide appropriate facilities to eliminate the risk of accidental INNS transfer - FACT campaign and web site -Invasive Species Scotland website

³⁰ www.invasivespeciesscotland.org.uk

³¹ <http://www.snh.org.uk/pdfs/scottish/squirrel.pdf>

Stakeholder Group	Priority Area	Mechanism of Delivery
Landowners	<ul style="list-style-type: none"> - Promote knowledge of biosecurity issues amongst all tenants and resource users - Identification of suitable persons to act as “alien spotters” for the RDT 	<ul style="list-style-type: none"> -Work with RDT to ensure dissemination of best practices and appropriate signage to reduce INNS threats -RDT to offer training for “alien spotters” -Invasive Species Scotland website
Angling clubs	<ul style="list-style-type: none"> - Promote knowledge of biosecurity issues amongst all members and visiting anglers - Ensure the distribution of information and erection of signage in fishing huts and recognised car parks -Recommend suitable members to act as “eyes” 	<ul style="list-style-type: none"> -Work with RDT to ensure dissemination of best practices and appropriate signage to reduce threats from INNS -RDT 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 	<ul style="list-style-type: none"> -Local Media Campaigns -Use of websites (RAFTS, NNSS) -RDT to develop a leaflet to promote the Biosecurity plan, the dangers arising from INNS and the reporting system -Promote the Biosecurity Plan to all retail outlets who deal with NNS e.g. pet shops, garden centres -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"> - INNS included in classroom talks - School visits focusing on impact of INNS on natural ecology and economy

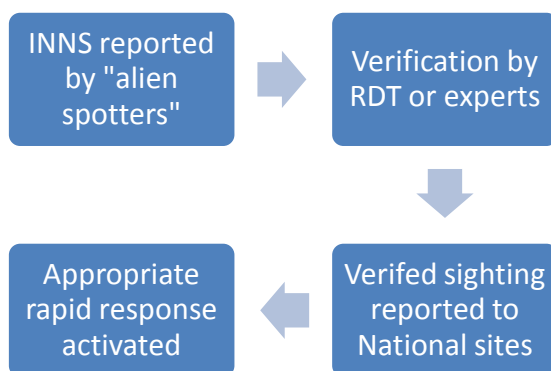
Table 8 Proposed roles and/or actions of key government and non government agencies in promoting awareness of INNS issues

Stakeholder Group	Priority Action	Mechanism of Delivery
RDT	<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 to coincide with National Biosecurity Action -Develop a leaflet to promote the Biosecurity plan, the dangers arising from INNS and the reporting system and ensure appropriate distribution to stakeholders -See actions for RDT above
DDSFb	<ul style="list-style-type: none"> -Continue to promote INNS awareness to anglers and angling clubs through open days, field visits and demonstrations 	<ul style="list-style-type: none"> -Continue to promote disinfection of equipment and provide appropriate facilities - Continue to enforce stocking legislation
Aberdeenshire 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
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	<ul style="list-style-type: none"> -Promotion of good practice in the prevention, control and eradication of INNS. -Provision of funding for local INNS initiatives 	<ul style="list-style-type: none"> - Holding of SNH Sharing Good Practice events. - <i>SNH part funded this biosecurity plan.</i>
SWT	<ul style="list-style-type: none"> -Promotion of good practice in the prevention, control and eradication of Grey squirrels. 	<ul style="list-style-type: none"> -Presentations and promotional material -Establish distribution, then trapping -Implement Scottish Strategy for Red squirrel Conservation

The delivery mechanisms form the basis for actions required to promote awareness amongst key stakeholders of the Dee district. The actions are presented in Section 5.2 along with the responsible agency and an implementation timeframe.

Objective 2: Establish optimum early surveillance, detection, monitoring and RRM for identified INNS which pose significant threats to local biodiversity and economy

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



The “alien spotters” of the early warning system (Box 1) will be trained members of the public, bailiffs, ghillies, canoeists and walkers. Reported sightings will be verified by trained RDT personnel or experts associated with the North East of Scotland Biological Recording Centre (NESBReC). Sightings of GB or local high priority species (Table 10) will be verified within 48 hours. If confirmed, it will initiate the appropriate GB or local high priority response (see Output 2.2 below). Reports of lower priority species will be verified as time permits.

All verified sightings will be entered onto the RDT Geographic Information System to monitor INNS distributions within the district and reported to NESBReC and RAFTS. The record will go onto the National Biodiversity Network (NBN). Actions to establish the reporting system are presented in Section 5.2.

Output 2.2: Rapid response mechanism (RRM) established and functioning.

The type of rapid response will depend on the species detected (Table 10) and the threat posed. There are three levels of response:

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

Table 10 Response level for the 39 invasive non-native species

GB Response	High Priority Local Response	Priority Local Response
Gyrodactylus salaris	Water fern	American mink
Asian topmouth gudgeon	Ruffe	Grey squirrel
Ruddy duck	Bullhead	Canadian pond weed
Didemnum spp	Parrot’s feather	Nuttal’s pond weed

Water primrose	Curly waterweed Australian swamp stonecrop Orfe American signal crayfish Mitten crab Slipper limpet Zebra mussel Common cord grass Wireweed Fanwort Large flowered waterweed Floating pennywort	Japanese knotweed Himalayan balsam Giant hogweed Rhododendron Rainbow trout Minnow <i>Ranunculus sp.</i>
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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 Scottish Government. There is no agreed species list at present; this work is being taken forward by the Scottish Working Group on INNS and will be circulated to all interests once agreed.

A confirmed sighting of a GB priority species will trigger the GB contingency plan for that species, for example *Gyrodactylus salaris*. However, there is still a need for local level protocols to link with and assist the GB response, as well as 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 11. Actions to establish the RRM are presented in Section 5.2.

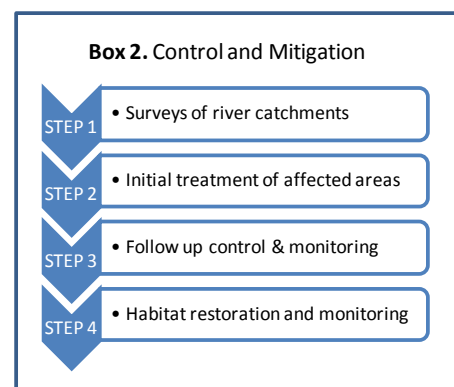
Table 11 Elements of contingency plans or protocols for response to GB priority, local high priority and priority species

GB Response	Local High Priority Response	Local Priority Response
<ul style="list-style-type: none"> -Report to local and GB institutions -Determine the extent of infestation -Isolate area where practicable 	<ul style="list-style-type: none"> -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 for eradication/containment. - Approve eradication methodology -Monitor 	<ul style="list-style-type: none"> -Report to local and GB institutions -Determine the extent of infestation -Survey 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

Objective 3: Develop effective control and eradication programmes for existing INNS which are operational and sustainable.

Output 3.1 Effective sustainable control/eradication programmes within the district are established and fully functional

Surveys will identify INNS distributions within the district. Survey information will be entered onto GIS and analysed to target nascent and “upstream or source” populations of INNS that are potential sources of spread and re-infestation. Control and eradication programmes will be phased, with treatment commencing at the upstream point of distribution and then systematically progressing downstream. A



combination of specialist contractors, volunteers and RDT/DDSFB staff will be used depending on the area involved's management requirements. Envisaged mitigation, eradication and control measures for INNS present in the Dee catchment are presented in Table 13.

Table 13 INNS Control and Eradication in the Dee district.


SPECIES	ACTION	TREATMENT/POST TREATMENT ACTIONS
Japanese knotweed	Control/Eradication Identify and close pathways.	Leaf spraying with Glyphosate by contractors for large populations with follow up of stem injection treatment to maintain control. Stem injection by landowners for smaller populations and individual plants
Himalayan balsam	Control/Eradication Identify and close pathways	Hand pulling by landowner/ contractor. Monitor catchment for activation of dormant sources of infestation
Giant hogweed	Control/Eradication Identify and close pathways	Spray large areas with aquatic roundup 3x in year 1; repeat as required. Stem injection is also an option. Monitor catchment for activation of dormant sources of infestation
Ranunculus sp	Control/Eradication	Hand pulling by DDSFB/ landowners from spawning gravels and freshwater pearl mussel beds. Start at known upper limit of distribution, prevent further spread.
Rhododendron	Monitor distribution	Felling by landowner where appropriate
Canadian pond weed	Monitor distribution	
Nuttall's pond weed	Monitor distribution	
American mink	Control/Eradication	Continue monitoring and trapping programme
Grey squirrel	Control/Eradication	Expand monitoring and trapping programme
American signal crayfish	Control/Eradication	Monitor population status. Immediate treatment if discovered in district
Rainbow trout	Monitor distribution	Monitor. Immediate treatment if viable breeding population discovered. Close potential escape avenues
Minnow	Restrict to present distribution	
Fish disease	Monitor	Take badly infected fish for analysis by MS

Actions required to establish the proposed control/eradication programme are presented in Section 5.2.

Output 3.2 A locally based cross-agency group is established to implement non-government actions specified within the DBP.

Sustainable and effective implementation of biosecurity measures at local level would be facilitated by establishing a multi-stakeholder group or forum, for example **The North-East Biosecurity Group (NEBG)** (ADAS, 2008³²). This group would plan and coordinate activities on behalf of all stakeholders within the district. The consultation procedure to finalise the DBP would assist in the development of such a group from principal stakeholders.

NEBG's remit would effectively be the co-ordinated implementation of this Biosecurity Plan. This also requires support from partners and a focal point to facilitate delivery of the following issues:

-  Promoting awareness of the impacts of INNS to all stakeholders.

³² http://www.snh.org.uk/pdfs/publications/commissioned_reports/Report%20No299.pdf

- 🌿 Development of early surveillance, detection, monitoring and rapid response mechanisms.
- 🌿 Maintaining a database of all INNS sightings.
- 🌿 Maintaining INNS on a GIS system.
- 🌿 Instigating and coordinating appropriate control measures (eradication/containment) for identified INNS.
- 🌿 Monitoring effectiveness of all measures to reduce/eliminate the impact of INNS.
- 🌿 Liaising with government bodies with regard to use of best practices, legislative and policy issues.

The actions required to develop a stakeholder group or forum are presented in Section 5.2.

5.2 Actions

This section presents 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.

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

ACTION	LEAD	PARTNERS	TIMEFRAME							
			2009	2010	2011	2012	2013	2014	2015	2016	2017
Objective 1: Reduce the risk of introduction of new INNS within the Dee district.										
Output 1.1: Key stakeholders aware of INNS impacts and measures required to prevent introduction and spread										
Launch RDT Biosecurity plan both nationally and locally through press release	RDT			—						
Produce leaflet on legislation including waste management & planning regulations	AC*	SNH*, SEPA *		.....					
Produce leaflet on biosecurity risks and the reporting system	CNPA *, RDT	SNH, SEPA		—						
Produce posters on biosecurity risks and distribute to target groups and general public	CNPA, SWT	RAFTS*, SNH, SEPA, Plantlife, RDT	.....	.....	.....	.....	.....	.....	.....	.....
Continue to promote and install disinfection facilities for anglers at appropriate locations	DDSB/RDT		—	—	—	—	—	—	—	—
Develop interim code of practice with Aberdeen Harbour Authority	AHA*	RDT		.....					
Distribute codes and posters to relevant retail outlets and clubs, at open days and events such as agricultural shows	DDSB/RDT, AC, SWT	SNH, SEPA		—	—	—	—	—	—	—
Engage with Landowners and angling clubs to promote awareness amongst tenants, resource –users, members and visitors through leaflets	RDT	SNH, SEPA, CNPA, SWT		.....					
Work with environmental groups and local schools to enhance awareness of INNS	RDT	SNH, SWT		—	—	—	—	—	—	—
Objective 2: Establish optimum surveillance, detection, monitoring and RRM for identified INNS posing significant threats to local biodiversity and economy										
Train RDT/ DDSFB personnel in the identification of INNS	RDT	SNH, RAFTS, CNPA, SWT	.....	.....				
Train RDT/ DDSFB as trainers	RDT	SNH, RAFTS, CNPA, SWT		—						

ACTION	LEAD	PARTNERS	TIMEFRAME									
			2009	2010	2011	2012	2013	2014	2015	2016	2017	
Work with user and interest groups to identify and train "alien spotters"	RDT/ DDSFB	NESBReC*, SNH, CNPA, SEPA, DGG*, SWT		.....							
Produce database to record and manage INNS sightings	RDT	RAFTS, NESBReC		=====								
Establish, test and refine communication mechanisms within surveillance system	RDT/ DDSFB	RAFTS		.....							
Monitor and periodically evaluate efficacy of surveillance system	RDT	RAFTS		=====								
Output 2.2 Rapid response mechanism (RRM) established and functioning.												
Formulate contingency plans	RDT/ DDSFB	AC, SEPA, SNH, CNPA, SWT		.....							
Identification and training of personnel	RDT	AC, SEPA, SNH, CNPA, DGG		=====								
Refresher training	RDT					---		---	---	---	---	---
Establish local communications systems	RDT	AC, SEPA, SNH, CNPA		.....							
Monitor riparian and aquatic habitats	RDT			=====								
Objective 3: Develop effective control and eradication programmes for existing INNS which are operational and sustainable.												
Output 3.1 Effective sustainable control/eradication programmes within the Dee District are established and fully functional												
Initiate and complete catchment INNS plant surveys by trained personnel	RDT	DDSBF		.....							
Establish "upper limit" removal programme of INNS plants	RDT/ DDSFB	SNH, SEPA, Landowners		=====								
Remove aquatic INNS plants from vulnerable spawning habitat and pearl mussel beds	RDT/ DDSFB	SNH, SEPA, Landowners		-----								
Continue catchment wide raft surveys and control of American mink	Mink Project, RDT	DDSBF, DGG, AU*, RAFTS, Landowners		=====								
Expand monitoring and trapping programme for Grey squirrels	SWT	DGG, DDSFB/ RDT		-----								
Continue monitoring for presence of American signal crayfish	RDT	DDSBF, DGG, Landowners		=====								
Continue fish monitoring programme to detect INNS impacts	RDT	MS*		-----								
Establish local and national GIS database for recording and mapping INNS	RDT, RAFTS, NESBReC	DGG, volunteers		=====								
Monitor the effectiveness of control programmes	RDT			-----								
MS monitoring of disease and parasite outbreaks in district	MS	RDT/ DDSFB, DGG		=====								
Output 3.2 Establish local groups to implement non-government actions specified within the Dee District Biosecurity Plan under control of DDSFB/ RDT.												
Complete draft biosecurity plan	RDT			---								
Consult with all stakeholders to agree biosecurity plan	RDT	All		=====								
Consult with representatives from all stakeholder groups to form Dee Biosecurity Group	RDT	All		---								

SECTION 6 MONITORING

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

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

- 🌿 Assessment of efficacy of surveillance and rapid response systems.
- 🌿 Occurrence and distribution of INNS within the Dee area.
- 🌿 Effectiveness of control/eradication programme including:
 - Application/delivery of effective concentrations of biocides.
 - Checking treatments have been effective.
 - Re-treating immediately where treatment has been ineffective.
 - Monitoring and investigation of any apparent resistance to treatments.
 - Surveillance for signs of dormant plants becoming activated.
- 🌿 Assessment of ability to close established transmission pathways.
- 🌿 Monitoring effectiveness of legislation and codes of practice, especially those aimed at restricting or closing pathways.
- 🌿 Monitoring general activities within the district and assessing them in terms of risk for introducing INNS.
- 🌿 Monitoring of healthy native populations to detect INNS impacts.
- 🌿 Monitoring of habitats likely to be colonized first by INNS.

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