

River Annan Trust

Bio-Security Plan

2010 – 2016



PREPARED BY: The River Annan Trust 2010

SCOTTISH CHARITY: (SC041774)

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
AAG	(River Basin Management Planning) Area Advisory Group
ASSG	Association of Scottish Shellfish Growers
BTA	British Trout Association
DGERC	Dumfries & Galloway Environmental Resource Centre
DSFBs	District Salmon Fisheries Boards
FCS	Forestry Commission Scotland
MS	Marine Scotland
NNSS	Non Native Species Secretariat
RADSFb	River Annan & District Salmon Fisheries Board
RAFTS	Rivers and Fisheries Trusts of Scotland
RAT	River Annan Trust
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 the Annan Fisheries District and presents actions that have been agreed with stakeholders for the prevention, early detection, control and mitigation of the introduction and spread of selected Invasive Non-Native Species (INNS), fish diseases and parasites. The vision of this plan is:

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

Objective 1: Reduce the risk of introduction and spread of INNS within the Annan fisheries district.

- 🌿 **Output 1.1** - All key stakeholders aware of the ecological and economic impacts of INNS, means of introduction and spread as well as management best practices.

Objective 2: Develop optimum detection and surveillance of, and rapid response to, new INN species which pose a significant threat to local biodiversity and the economy.

- 🌿 **Output 2.1** - 'Early warning system' established for new and existing INNS in the district.
- 🌿 **Output 2.2** - Rapid Response Mechanism (RRM) established for new INNS which pose significant threats to local biodiversity and economy.

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

- 🌿 **Output 3.1** - Effective sustainable control/eradication programmes are established and operational.
- 🌿 **Output 3.2** - A locally based, fully resourced organisation is established to implement non-government actions specified within the Annan District Biosecurity Plan.

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

- 🌿 The maintenance and enhancement of biodiversity – invasion by non-native species is one of the top five drivers for global biodiversity loss and is increasing with globalisation and tourism.
- 🌿 The visual conservation and increased amenity value of local landscapes.
- 🌿 The prevention of the deadly salmon parasite *Gyrodactylus salaris* from entering the Annan district which would cause catastrophic economic and environmental loss.
- 🌿 A holistic, cost effective and collaborative control programme of INN plants such as Himalayan balsam and Japanese knotweed.
- 🌿 The conservation of important natural habitats for native species such as otter, Atlantic

- salmon and European eel.
-  The protection of the endangered water vole from American mink.
-  Prevent migration and monitor for the continued absence of signal crayfish within the Annan District.
-  Helping to ensure the outcomes of INNS management in the Annan District area is more cost effective, strategic and sustainable.

The actions required to realise the above objectives and outputs along with the lead agency, key partners and timeframe required for their implementation are presented in the table 1 below. Those identified as 'lead' or 'partner' organisations include those that are acting solely in an advisory capacity.

Table 1 - Timeframes and actions

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

Action	Lead	Partners	TIMEFRAME								
			2010	2011	2011	2012	2012	2013	2014	2015	2016
Objective 1: Reduce the risk of introduction and spread of INNS within the Annan fisheries district.											
Output 1.1: All key stakeholders aware of the ecological and economic impacts of INNS, means of introduction and spread as well as management best practices.											
Launch of Annan Biosecurity plan through national and local press release	RAT			—							
Produce leaflet on legislation including waste management & planning regulations	Local councils	AAG, SNH			—	—					
Produce leaflet on biosecurity risks and the reporting system	RAT /RAFTS	AAG, SNH	—								
Produce posters on biosecurity risks and distribute to the general public	RAFTS	RAT AAG Local Councils		.....	.....	.....	.....	.....	.....	.....	.....
Continue to promote and install disinfection facilities for anglers at all angling proprietors fishing huts/parking points	RAT	RADSFB		.....	.....	.....	.....	.....	.....	.....	.....
Develop interim code of practice with Harbour Authority	Port Authorities	RAT			—	—					

Action	Lead	Partners	TIMEFRAME								
			2010	2011	2011	2012	2012	2013	2014	2015	2016
Distribute Codes and posters to relevant retail outlets and clubs at open days and events such as agricultural shows	Local Councils	SNH AAG members			-----						
Engage with Landowners and angling clubs to promote awareness of measures to tenants, resource – users, members and visitors	RADSFB & RAT	SEPA, SNH	—————								
Work with environmental groups and local schools to enhance awareness of INNS	RAT	SNH		-----							
Objective 2: Develop optimum detection and surveillance of, and rapid response to, new INN species which pose a significant threat to local biodiversity and the economy.											
Output 2.1: ‘Early warning system’ established for new and existing INNS in the district.											
Train RAT personnel in the identification of INNS	RAT /RAFTS	SEPA, LEADER	—————								
Train RAT as trainers	RAT	RAFTS		———							
Work with user and interest groups to identify “monitors”	RAT				—————						
Training of “monitors”	RAT	RAFTS, SEPA			—————		—	—	—	—	
Manage database to record and manage INNS reports	RAT, DGERC	RAFTS		———							
Monitor and periodically evaluate efficacy of system	RAT & other partners			-----							
Output 2.2: Rapid response mechanism (RRM) established for new INNS which pose significant threats to local biodiversity and economy.											
Formulate contingency plans for key species	RAFTS & RAT	Local councils, SEPA, SNH		—————							
Identification of personnel for response teams	RAT	Local Council, SEPA and SNH	———								
Training of personnel to execute contingency plans	RAT	Local Council, SEPA and SNH		—————							
Identification of funding resources	RAT	Local Council, SEPA and SNH, RAFTS	-----								

Action	Lead	Partners	TIMEFRAME								
			2010	2011	2011	2012	2012	2013	2014	2015	2016
Refresher training	RAT	RAFTS					—	—	—	—	—
Monitor populations/treated areas	RAT	SEPA		.....	.....	.....	.....	.....	.....	.....
Objective 3: Develop effective control and eradication programmes for existing INNS which are operational and sustainable.											
Output 3.1: Effective sustainable control/eradication programmes are established and operational.											
Initiate and complete catchment wide surveys by trained personnel	RAT	SFCC	—	—	—	—	—				
Develop GIS database for recording and mapping INNS within the Annan district	RAT	SFCC		—							
Continuation of mink eradication programme	RAT	SEPA	—	—	—	—	—	—	—	—	—
Implementation of phase 1 of control/eradication programme see table 10 for details of proposed works	RAT	Angling clubs, landowners, SEPA, CJS	—	—	—	—	—	—	—	—	—
Implement habitat restoration scheme within successful control areas taking into account all relevant species	RAT	Local Council, SEPA ¹			—	—	—	—	—	—	—
Monitor the effectiveness of control programmes	RAT			—	—	—	—	—	—	—	—
Output 3.2 – A locally based, fully resourced organisation is established to implement non-government actions specified within the Annan District Biosecurity Plan.											
Complete draft Biosecurity plan	RAT			—							
Consultation with all stakeholders to agree Biosecurity plan	RAT	All		—							
Consult with representatives from all stakeholder groups	RAT	All		—	—						
Identify and develop opportunities for future funding of eradication projects	RAT	SEPA, AAG, SNH, LEADER, Landtrust		—	—	—	—	—	—	—	—

¹ May be eligible for funding from the Restoration Fund

1. SCOPE AND PURPOSE

This plan describes the biosecurity issues of the River Annan Trust and presents actions that have been agreed with stakeholders for the prevention, early detection, control and mitigation of the introduction and spread of selected Invasive Non-Native Species (INNS), fish diseases and parasites. The vision of this plan is:

'To establish a sustainable framework which will prevent, detect, control and eradicate invasive non-native species within the Annan 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 introduction and spread of INNS within the Annan fisheries district

Objective 2: Develop optimum detection and surveillance of, and rapid response to, new INN species which pose a significant threat 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 Britain²](#):

-  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 and a summary of these are described below;

-  The maintenance and enhancement of biodiversity – invasion by non-native species is one of the top five drivers for global biodiversity loss and is increasing with globalisation and tourism.

² www.nonnativespecies.org

- 🌿 The visual conservation and increased amenity value of local landscapes.
- 🌿 The prevention of the deadly salmon parasite *Gyrodactylus salaris* from entering the Annan district which would cause catastrophic economic and environmental loss.
- 🌿 A holistic, cost effective and collaborative control programme of INN plants such as Himalayan balsam and Japanese knotweed.
- 🌿 The conservation of important natural habitats for native species such as otter, Atlantic salmon and European eel.
- 🌿 The protection of the endangered water vole from American mink.
- 🌿 Prevent and monitor the presence of signal crayfish within the Annan District.
- 🌿 Helping to ensure the outcomes of INNS management in the Annan District area is more cost effective, strategic and sustainable.

2. BACKGROUND

Although prepared by the River Annan Trust (RAT), this plan is one of a set biosecurity plans being produced throughout Scotland as part of a national programme of action implemented through the Rivers and Fisheries Trusts of Scotland (RAFTS) with backing and support from the Scottish Government (SG), LEADER, Scottish Environment Protection Agency (SEPA) and Solway Heritage.

The need for action on biosecurity issues has been identified in the River Annan and District Salmon Fishery Board [Fisheries Management Plan](#)³ and in the [Solway Tweed River Basin Management Plan](#)⁴ 2009-2015. 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 River Annan Trust through which stakeholders identified and agreed the aims, outputs and actions presented in this plan. The plan builds partnerships of differing groups of stakeholders to implement the actions required to address the complex issues associated with biosecurity. This plan therefore represents the agreed approach of the River Annan Trust, stakeholders and appropriate regulatory agencies in Annandale for the prevention, early detection and control of non-native invasive species, fish diseases and parasites. As the spread of INNS is not isolated to The River Annan this plan will also facilitate coordination and communication with the neighbouring fisheries Trusts, Boards, local authorities and other stakeholders of neighbouring areas e.g. Nith and Galloway.

³<http://www.annanfisheryboard.co.uk/PICS/Annan%20FMP.pdf>

⁴ www.sepa.org.uk/water/idoc.ashx?docid=12b2777c-2811-473e-8a49-1c0d7dbbdb4c&version=-1

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](#)⁵ commissioned by Scottish Natural Heritage in 2001, 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 \(2006\)](#)⁶, 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](#)⁷ 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 \(2003\)](#)⁸ has estimated the total cost of its removal using current techniques at £1.56bn.

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

⁶ <http://www.cbd.int/gbo2>

⁷ <http://www.defra.gov.uk/wildlife-pets/wildlife/management/non-native/about.htm>

⁸ <https://secure.fera.defra.gov.uk/nonnativespecies/downloadDocument.cfm?id=329>

- 🌿 A Scottish Government [report](#)⁹ 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](#)¹⁰ 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*), ruffe (*Gymnocephalus cernuus*) and roach (*Rutilus rutilus*). The ruffe in particular has decimated the once significant and diverse population of the rare and protected Powan (*Coregonus lavaretus*) in Loch Lomond. Closer to home, the roach significantly contributed to the decline and loss of the Vendace (*Coregonus albula*) from Mill Loch in the 1990's.

Without some form of coordinated and systematic approach to the prevention of introduction and control of the spread of INN species 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 Annan Fisheries 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 the Scottish Government.

⁹ www.scotland.gov.uk/resource/doc/1062/0042434.pdf

¹⁰ [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)

¹¹ www.nonnativespecies.org

¹² <http://www.snh.org.uk/pdfs/species/Species%20Action%20Framework.pdf>

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:

- ④ Section 14 of [The Wildlife and Countryside Act \(1981\)](#)¹³ 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 are 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.
- ④ 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.
- ④ 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.
- ④ The [Possession of Pesticides \(Scotland\) Order 2005](#)¹⁵ regulates the use of pesticides and herbicides for the control and eradication of INNS.
- ④ [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 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.
- ④ [The Waste Management Licensing Regulations 1994](#)¹⁷ 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”.
- ④ [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 the handling and transfer of controlled waste.
- ④ [Salmon and Freshwater Fisheries \(Consolidation\) \(Scotland\) Act 2003. Section 33A](#)²⁰ makes it an offence to for any person to intentionally introduce any live fish or spawn of any fish into inland waters.
- ④ [The Aquaculture & Fisheries \(Scotland\) Act 2007](#)²¹ that regulates against the unauthorised introduction of fish to inland waters.

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

¹² www.netregs.gov.uk/netregs/63095.aspx.

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

²⁰ <http://www.legislation.gov.uk/asp/2003/15/contents>

- 🌿 The [Prohibition of Keeping or Release of Live Fish \(Specified Species\) Order 2003](#)²² requires that a licence be obtained for the keeping or release of species listed on Schedules 1 and 2.
- 🌿 The [NetRegs](#)²³ 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 River Annan DSFB Fisheries Management Plan
- 🌿 The Solway Tweed River Basin District Management Plan
- 🌿 The Dumfries & Galloway Local Biodiversity Plan

Furthermore, it supports the conservation objectives of designated conservation areas (SAC, SSSI, RAMSAR) in the Annan district.

Table 2 - Identified Actions in the River Annan Fisheries District Biosecurity Plan supporting provisions or requirements of other relevant plans

Provision or Requirement of Existing Plan	Action in Biosecurity Plan
<p>Plan: The River Annan DSFB Fisheries Management Plan²⁴ 2009-2014.</p> <ul style="list-style-type: none"> ▪ The need for biosecurity planning ▪ Need for surveys, monitoring and raising awareness 	<p>The biosecurity plan fulfills the identified need for biosecurity planning and other identified biosecurity measures in the Fisheries Management Plan.</p>
<p>Plan: Gyrodactylus salaris (Gs) Contingency Plan²⁵</p> <ul style="list-style-type: none"> ▪ A strategy to rapidly contain and eradicate Gs if introduced to Scotland. 	<p>Formulate rapid response protocols for new INN species which pose significant threats to local biodiversity and economy.</p>
<p>Plan: Dumfries & Galloway Local Biodiversity Action Plan²⁶</p> <ul style="list-style-type: none"> ▪ Minimise the impact of INNS on biodiversity 	<p>This plan identifies the need to minimise the impact that INNS have on local biodiversity and highlights the need for a co-ordinated effort in controlling the further spread of INNS and preventing the introduction of new INNS.</p>

²¹ http://www.opsi.gov.uk/legislation/scotland/acts2007/asp_20070012_en_1

²² <http://www.scotland.gov.uk/resource/doc/47133/0009766.pdf>

²³ <http://www.netregs.gov.uk/netregs/default.aspx>

²⁴ <http://www.annanfisheryboard.co.uk/PICS/Annan%20FMP.pdf>

²⁵ www.scotland.gov.uk/Topics/Fisheries/Fish-Shellfish/18610/diseases/g-salaris/GsCGrev

²⁶ <http://www.dumgal.gov.uk/CHttpHandler.ashx?id=2727&p=0>

Provision or Requirement of Existing Plan	Action in Biosecurity Plan
<p>Plan: The Annan Catchment Co-Ordination Project</p> <ul style="list-style-type: none"> ▪ The need to identify invasive plants and provide guidance to eradication 	<p>Identifies the importance of a co-ordinated approach to balance the requirements of people and wildlife in general as well as tackling INNS.</p>
<p>The RBMP for the Scotland and the Solway Tweed River Basin Management Plan²⁷</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 reinfestation in the surrounding area. ▪ Establishment of detection / surveillance /control strategies for problem species. ▪ Risk assesment 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. ▪ Development of biosecurity plans to prevent movement of species between catchments and respond quickly to new infestations. ▪ The North Solway Area Management Plan highlights the importance of recording the presence of invasive non-native species in a local context, particularly riparian species, and recommends that a program of eradication is undertaken by working in partnership. 	<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>Plans supporting designated conservation areas (SACs and SSSIs). Scotland's Biodiversity: A strategy for the conservation and enhancement of biodiversity in Scotland²⁸.</p>	<p>Supports the conservation of biodiversity target species through the control and eradictaion of INNS detrimental to their ecology</p>

4. SCOPE OF THE PLAN

4.1 Description of the River Annan Trust area

The River Annan Trust area covers all the water that runs into the Solway between the West bank of the Sark (but not including the Sark or any of its tributaries) near Gretna and the West bank of the Lochar Water (including the Lochar and all of its tributaries). The principal rivers entering the Solway in this area

²⁷ http://www.sepa.org.uk/water/river_basin_planning.aspx

²⁸ www.scotland.gov.uk/Publications/2004/05/19366/37239

are (from east to west) the Kirtle Water, The River Annan, the Pow Water and the Lochar Water. The River Annan dominates the area and is a watercourse with a catchment area of 950km². Its main tributaries are the Mein (39km²), Water of Milk (127km²), the Dryfe Water (119km²), The Wamphray (26km²), The Moffat Water (75km²), The Evan Water (82km²) and the Kinnel (230km²) which has the Water of Ae (146km²) as a significant tributary. The Lochar, Kirtle and Pow are 126km², 87km² and 24km² respectively.



Map 1 - River Annan District

4.2 Summary of district land use

The Annan catchment is dominated by agricultural land use. SEERAD (2000) estimated that 70% of the area is managed for this purpose. A wide range of species are supported in a variety of habitats ranging from heathland, parkland, scrub and many types of grassland. Of this 70%, the majority of activity centres around grass for livestock grazing with approximately 31% of the agricultural land classified as such. Other uses include semi-improved agricultural land such as wood pasture and scrub (5%) and arable land 7.5 % (SEPA, 2002).

Of the remaining land (around 30%), coniferous woodland such as Sitka spruce accounts for 27% with approximately 2% being broad leafed species such as oak, alder and ash. Urban areas account for less than 1% of the catchment area with the majority of this centred round the towns of Annan, Dumfries, Lockerbie and Moffat (SEPA, 2002).

4.3 Biosecurity: Current and potential threats

This section identifies 27 INNS and fish diseases for inclusion in the RAT Biosecurity Plan of which 18 high priority species will be the main focus for action. The priority species were identified as those that:

-  Already exist within the River Annan catchment area.
-  If introduced would have severe consequences for local biodiversity and economy; and /or
-  Have a high risk of introduction due to nature of the pathways for their introduction and their current geographic proximity.

4.3.1 Current biosecurity issues

Current biosecurity issues in the Annan catchment are associated with 13 INNS:

-  American mink (*Mustela vison*) are present on most of the Annan Catchment. Mink spread by migration and kill water fowl, small mammals and juvenile salmon and trout. Mink are linked to the decline of water voles which in recent years have scarcely been reported on the River Annan.
-  Rhododendron (*Rhododendron ponticum & hybrids*) is present in a few locations throughout the upper catchment. The main area impacted is Birnock Water in Moffat where a number of large shrubs have created a dense thicket at the bottom of gardens. The plant spreads by natural seed and vegetative dispersal after intentional planting in gardens, parks and demesnes. It forms dense thickets and outcompetes native plants for space and resources with impacts on fish and invertebrate communities as well as preventing site access.
-  Japanese knotweed (*Fallopia japonica*) is extensively located throughout the main Annan catchment. Moffat is home to the largest stands which are also the upper most stands of Japanese knotweed within the catchment. From here, it has spread along the river 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 prohibits regeneration. Dense growth of Japanese knotweed can also hinder access, reduce biodiversity and alter the habitat for wildlife.

- 
 Himalayan balsam (*Impatiens glandulifera*) is present along the River Annan from Threewaters Meet to Annan itself. 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.

- 
 Rainbow trout (*Oncorhynchus mykiss*) are farmed at Selcoth Fisheries, Moffat Fisheries, Carse of Ae and Ae Fisheries. Periodically there are escapes from these farms and rainbow trout appear in the river. However, so far there has been no sign of a breeding population becoming established. Farmed fish are a potential source of viral and bacterial diseases affecting wild salmonids and they also compete for resources with native species if allowed to escape.

- 
 Common cord grass (*Spartina anglica*) is present within the Solway Firth close to Annan. It is a perennial salt marsh grass which has been planted widely to stabilise tidal mud flats. Its natural dispersal is by seed and expansion through the rhizomes, seeds can remain dormant for several years. Its invasion and spread creates mono-specific stands in the upper intertidal areas often occupied by *Zostera*. This can reduce feeding areas for bird species, in particularly geese that depend on this habitat for food.

- 
 Canadian pondweed (*Elodea canadensis*) is present in various locations throughout the Annan district. It is spread by disposal of plants or plant fragments near waterways, escapes from garden ponds during flood episodes and possibly by birds and other animals. Canadian pondweed dominates native macrophyte communities which can lead to their extinction and thereby impacts local invertebrate communities. It can also increase metal loads within waterbodies that compounds its impacts on native flora and fauna.

- 
 Nuttall's pond weed (*Elodea nuttallii*) is present in locations within the catchment of the River Annan. Nuttall's pond weed dominates native macrophyte communities and this can lead to their local extinction. Impacts have also been recorded on invertebrate communities. All *Elodea* species take up metals from the sediment and release them into the water. *E. nuttallii* is very tolerant of copper in particular.

- 
 Australian swamp stonecrop (*Crassula helmsii*) has been reported in the south of the catchment and is suited to a wide range of slow moving freshwater systems. It outcompetes native species and forms dense carpets choking ponds and ditches. Reduced light levels below the carpets can cause die off of waterweeds and algae and reduce water oxygenation levels. It can spread from an infested site to new sites by animal and human activity. Introductions are usually from trade for garden ponds and/or disposal or escape into the wild from private gardens.

- 
 Snowberry (*Symphoricarpos albus*) is present on the banks of Birnock Water and the main river. It is often planted as cover for game birds and forms large thickets in woodlands and shrubberies.

-  Orfe (*Leuciscus idus*) have been introduced into one stillwater coarse fishery at Dormont and may be present in several more. In the river two examples of Orfe fry were found several years ago (in the Calflake Burn) but it is not known whether they are successfully breeding or not. Because the young fry were found in the Calflake Burn, which acts as the discharge to Castle Loch and Hightae Mill Loch, it is possible that this species is present in both these lochs. Orfe, in their natural range, are a river fish so a breeding population could pose a competition problem for some of our native species. However there are no recorded impacts and the species is classified as medium impact by UKTAG.

-  Barbel (*Barbus barbus*) There is anecdotal evidence that barbel has been stocked in the 1970's on the Annan. It is present in at least one Stillwater fishery in the district and containment will be required to prevent further spread.

-  Fringed water lilly (*Nymphoides peltata*) is currently present around Lochmaben. The plant thrives in nutrient rich shallow water bodies and is an aggressive plant capable of rapid growth and spread which can displace native species and reduce biodiversity.

4.3.2 Potential biosecurity issues

The invasive non-native species listed below are not currently present within the Annan district. 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 the uses within the Annan district.

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 five High threat level species that could be introduced into the Annan district and they include the fish parasite *Gyrodactylus salaris*, three freshwater invertebrates and one riparian plant species (Table 3).

Table 3 - 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, ballast water ▪ Unregulated fish movement 	<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>Pacifasticus leniusculus</i>)	High - Through intentional/ unintentional introduction from an existing population nearby. Could also be introduced through: <ul style="list-style-type: none"> ▪ Stocked fish ▪ Use of fish food ▪ Intended for food in restaurants ▪ Natural migration across catchment boundaries 	<ul style="list-style-type: none"> ▪ Burrows into river banks causing destabilisation and increased siltation ▪ Direct competition and predation on fish as well as territorial competition ▪ Diet include small fish, fish ova and invertebrates
Giant hogweed (<i>Heracleum mantegazzianum</i>)	High – Through natural seed dispersal, coastal distribution or contaminated soil.	<ul style="list-style-type: none"> ▪ Out competes native vegetation for space and resources shading out desirable vegetation. ▪ Winter dieback increases exposes bare soil to direct rainfall and floods. ▪ Giant Hogweed is a public health hazard as the toxins in the sap react with sunlight/UV ray causing the skin to blister and severe scarrin.
Zebra mussel (<i>Dreissena polymorpha</i>) Freshwater Bivalve	High - 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
Killer shrimp (<i>Dikerogammarus villosus</i>)	Medium - Found at Graftam Water, Cambridgeshire in September 2010 they have since been reported at 2 sites in Wales (Cardiff Bay and Eglwys Nunydd Reservoir). Possibility of unintentional introduction by anglers.	<ul style="list-style-type: none"> ▪ Voracious predator which kills a range of native species including young fish ▪ Often dominates the habitats it invades and has been known to cause the extinction of native species

There are also nine Medium threat level species of which there are five species with a medium risk of introduction and four species with a low risk of introduction (see Table 4 below). The UK TAG website www.wfduk.org lists other alien species which may also be at risk of introduction.

Table 4 - The risk of introduction of Medium threat level INNS.

SPECIES		RISK OF INTRODUCTION
Water primrose (<i>Ludwigia peploides</i>)	Medium	Present in NW England so could be translocated
Curly water weed (<i>Lagarosiphon major</i>)	Medium	Unintentional introduction from garden centres
Water fern (<i>Azolla filiculoides</i>)	Medium	Through intentional/unintentional introduction from numerous locations throughout Scotland, especially central belt
Parrot's feather (<i>Myriophyllum aquaticum</i>)	Medium	Through intentional/unintentional introduction from two existing populations in the south of Scotland
Wireweed (<i>Sargassum muticum</i>)	Medium	Through unintentional introduction
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
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 3 and 4, the main pathways or means of introduction of both High and Medium Threat level species into the Annan district are:

- 🌱 Intentional introduction or planting
- 🌱 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, fish factory waste.
- 🌱 Introduction of live fish, contamination of water used to transport live fish.

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:

- Scottish Government
- Local Councils
- Scottish Natural Heritage
- Scottish Environment Protection Agency
- Solway Heritage
- Association of Salmon Fishery Boards
- Rivers and Fisheries Trusts Scotland
- Forestry Commission
- National Farmers Union
- Landowners Association
- Scottish Water
- British Waterways
- River Annan & District Salmon Fisheries Board
- Local Wildlife Crime Unit
- Scottish Wildlife Trust
- British Trust for Conservation Volunteers

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 5.

Table 5 -Pathways and stakeholder groups in the Annan district.

Pathway	Stakeholders
Intentional introduction or planting	Riparian landowners, members of the public, local councils
Fouling and ballast water of marine vessels	Local port authorities/SEPA
Fouling and ballast water of freshwater vessels	Port Authority/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	River Annan & District Salmon Fisheries Board/Marine Scotland
Escapes from fish farms, ponds, gardens, and desmesnes.	Marine Scotland/ SEPA/ Planning Authorities/ Plantlife/ riparian owners/ members of the public/ angling clubs
Movement of contaminated soils or vehicles	Local Councils/SEPA/quarries/ building 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.

4.5 Existing Control Activities

INN Plant Species

The Dumfries and Galloway Riparian Invasive Non-Native Species (INNS) project was set up by a partnership group between the River Annan & District Salmon Fishery Board, SEPA, Solway Heritage and the River Nith District Salmon Fishery Board. The extent of the spread of Japanese knotweed and Himalayan balsam was mapped in 2007 and an Invasive Project Officer was employed in April 2010 to set up and carry out a strategic programme for eradication and control. Control work for these INN species began in the spring/summer of 2010.

Himalayan Balsam Control

Work to control Himalayan balsam on the River commenced on the 15th June 2010 with help from the Criminal Justice Service (CJS) who supplied community service work groups. The control work was carried out between its source at Threewaters Meet and Woodfoot Bridge. This is approximately a 1km stretch of river bank the team worked on between June and August. Fig 1 highlights the difficulty of balsam control as it grows amongst native vegetation as well as in dense stands (Fig 2)



Fig 1 – CJS work team

As well helping to control Himalayan balsam the work carried out has helped to improve access to the river for recreational use.



Fig 2 – Before and after control work

Japanese Knotweed Control

Control work for Japanese knotweed began in the summer of 2010 and was carried out on both Birnock and Annan Water trialling 2 different methods of control. The Stem Injection method was used on Birnock Water. This involves injecting a 2ml shot of herbicide directly into the hollow stem of the plant (Fig 3). The short term results have been quite positive (Fig 4) but long term data is needed to assess the true impact of this method of control. Stands on Annan Water have been sprayed using a knapsack applicator. This method allows control to be done quickly over a large area although its effectiveness is not yet known and research suggests this may need to be carried out at least 4 times during a growing season.



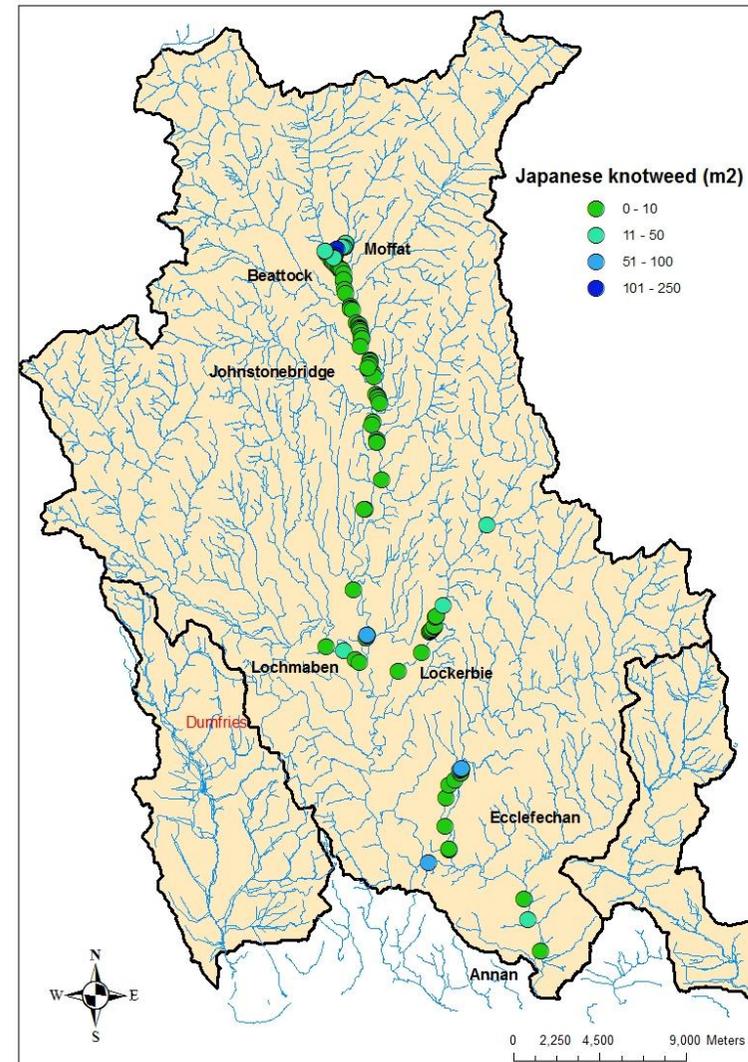
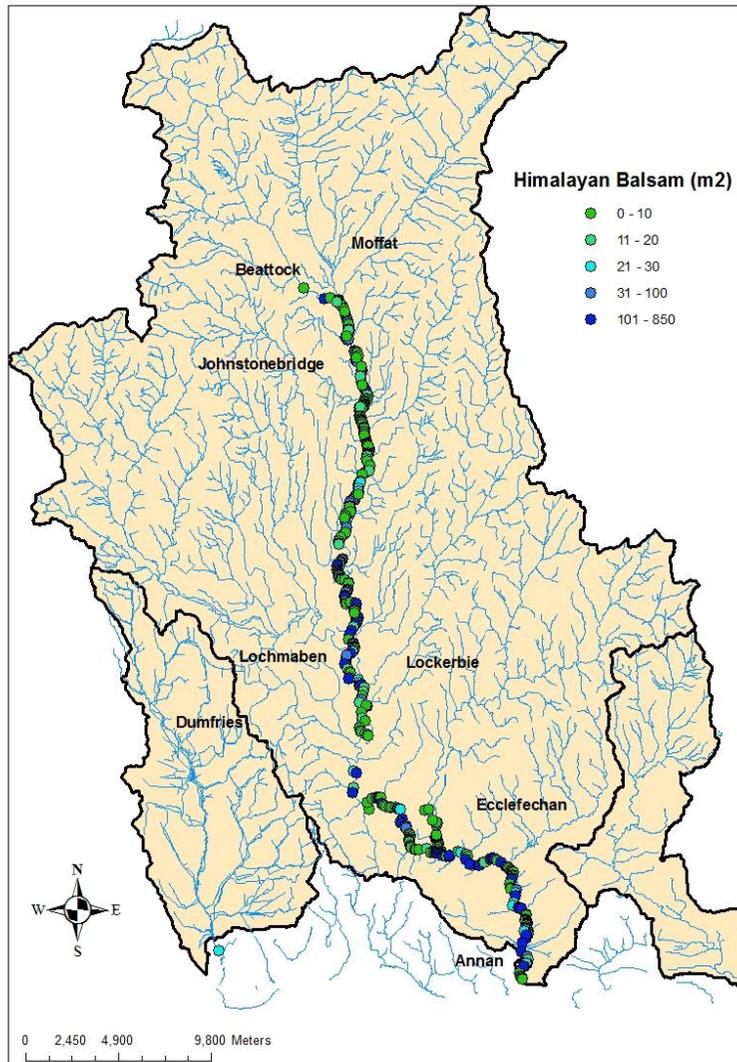
Fig 3 – Japanese knotweed control using the Stem Injection System

Both water bodies pass through the popular town of Moffat which appears to be the main source of spread for Japanese knotweed. Around 620 square metres of Japanese knotweed have been controlled using the Stem Injection System while 315 square metres



Fig 4 – Before and after control work using the Stem Injection System

MAP 2 – Distribution of Himalayan balsam and Japanese knotweed in the Annan river catchment

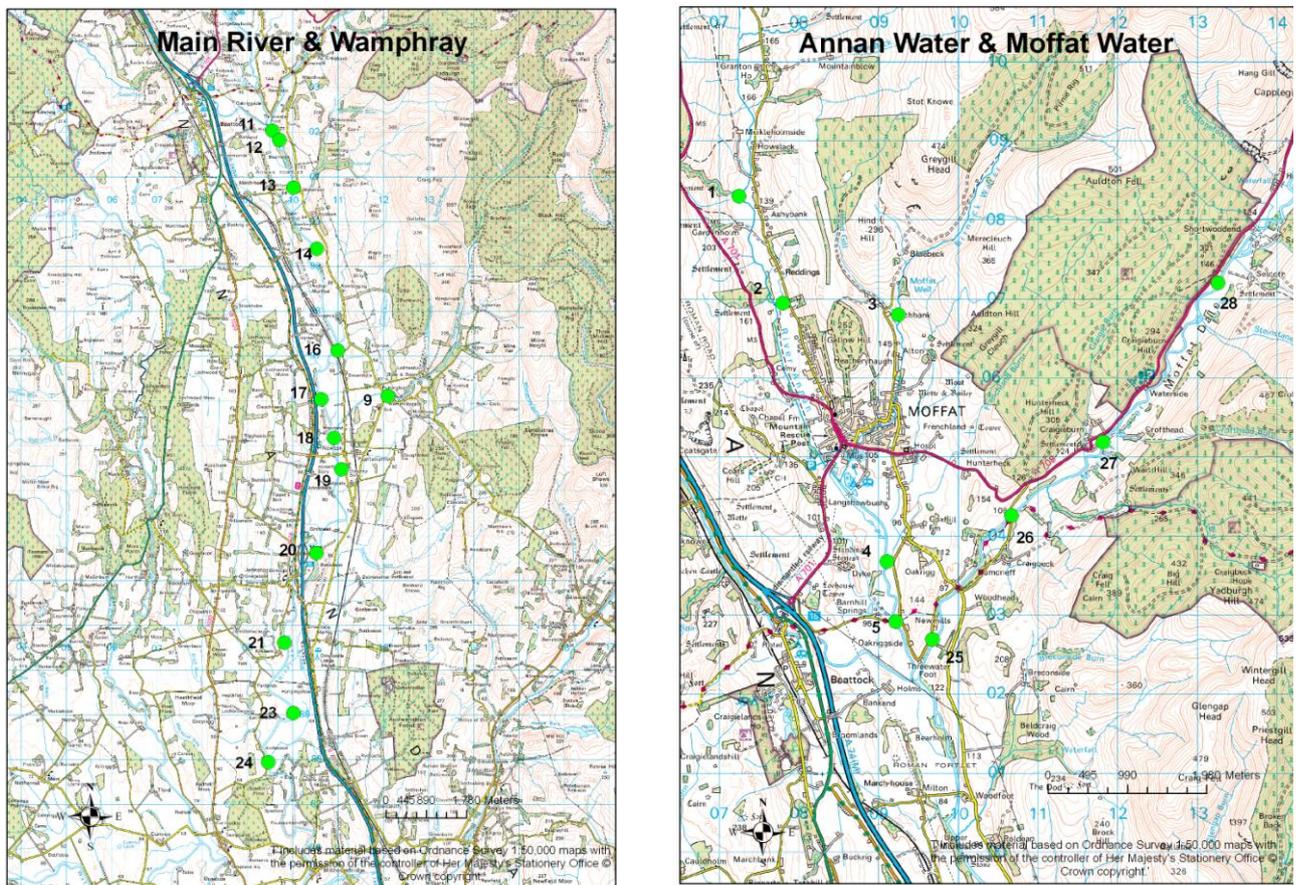


American Mink Control

In 2007 SEPA's Catchment Management Initiative for Dumfries and Galloway launched a project to begin water vole monitoring and mink trapping on the River Annan. Since the project began in 2007 the Annan DSFB has successfully trapped 54 mink throughout the catchment and identified the presence of six water vole and two water shrew populations.

The project utilises the Game and Wildlife Conservation Trust's mink raft to detect the presence of mink (and any other animal visiting the raft) by placing rafts approximately 1 kilometre apart. The rafts are checked every 2 weeks and traps placed as and when required.

MAP 3 – Distribution of mink rafts on Annan River catchments



Signal Crayfish Monitoring

An intensive trapping programme is being undertaken in the Annan catchment to monitor the presence of crayfish, focusing on the area around Beattock summit where the Annan is particularly at risk from the upper Clyde. As yet there have been no crayfish trapped.



Fig 5 - Signal crayfish

5. BIOSECURITY MANAGEMENT STRATEGY

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

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

5.1 Objectives and outputs

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.

Objective 1: Reduce the risk of introduction and spread of INNS within the Annan fisheries district.

- 🌱 ***Output 1.1 – All key stakeholders aware of the ecological and economic impacts of INNS, means of introduction and spread as well as management best practices***

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

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

The local priorities for awareness will focus on disrupting the pathways for the introduction and spread of INNS in the Annan District. The key stakeholders, the identified areas of priority and the proposed mechanisms for delivery are presented in Table 6 below. The roles and actions of key government agencies and non-government bodies in promoting awareness of INNS issues is presented in Table 7.

Table 6 - Priority areas for awareness and delivery mechanisms according to stakeholder group

Stakeholder Group	Priority Area	Mechanism of Delivery
Local Fish Farms	<ul style="list-style-type: none"> - Inform fish farms of the impact of INNS and how they spread - Dangers of importing from contaminated areas - Use of sufficient screens and other biosecurity measures - Dangers of importing stock from contaminated areas - Controls on movement of stock and water 	<ul style="list-style-type: none"> - RAT to work with local industry and trade associations to advise members regularly of best practice in respect of INNS - Enforcement agencies (Marine Scotland & ADSFB) to undertake site visits to discuss and advise on issues involving INNS e.g. rainbow trout - Invasive Species Scotland²⁹ website
Port Authorities	<ul style="list-style-type: none"> - Avoid pumping out of non-sterilised ballast water in harbour - Role of hull fouling in the introduction and spread of INNS 	<ul style="list-style-type: none"> -Promote implementation of code of practice requiring non-sterilised ballast water to be discharged away from harbour -RAT to assist with the supply of posters and other awareness material for display and signage. -Invasive Species Scotland website
Local Garden Centres	<ul style="list-style-type: none"> -Promote existing 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. 	<ul style="list-style-type: none"> -RAT to work with garden centres to encourage distribution of codes of practice and posters (available from Plantlife). -RAT to distribute leaflets to garden centres
Local Aquarium and Pond stockists	<ul style="list-style-type: none"> -Promote code of practice to all pet shops and suppliers of ornamental fish 	<ul style="list-style-type: none"> -RAT to work with retailers to encourage distribution of codes and posters (available from Plantlife)
Water User associations (canoeists, sailing clubs)	<ul style="list-style-type: none"> -Promote awareness to clubs and participants of the dangers arising from INNS 	<ul style="list-style-type: none"> -RAT to work with associations to promote disinfection of equipment and provide appropriate facilities to eliminate the risk of accidental transfer of INNS -FACT campaign and web site -Invasive Species Scotland website
Riparian 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 monitors for RAT 	<ul style="list-style-type: none"> -Work with ADSFB to ensure dissemination of best practices and appropriate signage to reduce threats from INNS -RAT to offer training for monitors -Invasive Species Scotland website
Angling clubs	<ul style="list-style-type: none"> - Promote knowledge of biosecurity issues amongst all members and visiting anglers - Promote the distribution of information and erection of signage in fishing huts and recognised car parks -Recommend suitable members to act as monitors 	<ul style="list-style-type: none"> -Local ACs to work with RAT to ensure dissemination of best practices and appropriate signage to reduce threats from INNS -RAT to work with associations to promote disinfection of equipment and provide appropriate facilities to limit the risk of accidental transfer of INNS -RAT to offer training for monitors -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 NNS e.g. pet shops, garden shops 	<ul style="list-style-type: none"> -Local Media Campaigns -Use of websites (RAFTS, INNS, RAT) -RAT to develop a leaflet to promote the Biosecurity plan, the dangers arising from INNS and the reporting system -Invasive Species Scotland website

²⁹ www.invasivespeciesscotland.org.uk

Stakeholder Group	Priority Area	Mechanism of Delivery
Contractors / Ground Maintenance Workers	- General awareness of impacts and measures to prevent/control INNS	- RAT to work with industry bodies to ensure dissemination of best practices - RAT to offer training for “eyes” through industry bodies Invasive Species Scotland website
Schools	- General awareness of impacts and measures to prevent/control INNS	-School visits -Field trips - Invasive Species Scotland website

Table 7 - Roles and/or actions of key government and non-government agencies in promoting awareness of INNS issues

Organisation	Role and/or action	Delivery Mechanisms
RAT	- Promote awareness to general water users promoting the Biosecurity Plan and highlighting the dangers from INNS	-Promote and launch of Biosecurity Plan -Develop a leaflet to promote the Biosecurity plan, the dangers arising from INNS and the reporting system and ensure appropriate distribution to stakeholders -See actions for RAT above
RADSF	-Continue to promote awareness to anglers and angling clubs of the dangers arising from INNS. -Liaising with riparian owners and tenants through DSFB's	-Continue to promote disinfection of equipment and provide appropriate facilities - Production of invasive weed management strategies and training courses for approved control techniques
Marine Scotland Science	-Regulation of movement and introduction of fish	-Licensing system for fish movements. -Promote disinfection of equipment and provide appropriate facilities to eliminate the risk of accidental transfer of INNS
Local Councils	- 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 INNS framework strategy to the general public -Encourage responsibility within local authorities for the control of all INNS on public land	- 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 -Issue INNS identification and guidance cards to appropriate council employees - Display posters (produced by RAFTS) in council offices, libraries and other public places
SEPA	- Clarify SEPA responsibilities for INNS to both staff and customers - Incorporate INNS issues into relevant guidance documents (as they are developed or updated)	- Page on website with links to relevant SEPA information and other sites e.g. Non-Native Species Secretariat, RAFTS, Scottish Canoe Association. - Digital documents available for download on SEPA Website
SNH	- Promotion of good practice in the prevention, control and eradication of INNS - Provision of funding for local INNS initiatives	- Holding of SNH Sharing Good Practice events. - Grant funding may be available for some projects.
Marine Scotland	-Fish Health Inspectorate part of Marine Scotland is lead body with respect ot fish diseases and escapes	- Undertake site visits to discuss and advise on issues involving INNS - Promote disinfection of equipment and provide appropriate facilities to eliminate the risk of accidental transfer of INNS

The delivery mechanisms form the basis for the actions required to promote awareness amongst the key stakeholders of the Annan District. These are presented in Section 5.2 along with the responsible agency and a timeframe for their implementation.

Objective 2: Develop optimum detection and surveillance of, and rapid response to, new INN species which pose a significant threat to local biodiversity and the economy.

 **Output 2.1 – ‘Early warning systems’ established for new and existing INNS in the district.**



The “monitors” of the early warning system will be trained members of the public, anglers, bailiffs, ghillies, canoeists and walkers with reported sightings verified by trained RAT personnel. A sighting of a GB or local high priority species (Table 9) 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 priority species will be verified as time permits. All verified sightings will also be entered onto the RAT Geographic Information System to monitor INNS distributions within the Annan District. Actions to establish the early warning system are described in Section 5.2.

 **Output 2.2 – Rapid Response Mechanism (RRM) established for new INNS which pose a significant threat to local biodiversity and economy.**

The type of response will depend on the severity of the species detected (Table 8) 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 8 - Response level for 30 invasive non-native species

GB Response	High Priority Local Response	Priority Local Response
Gyrodactylus salaris	American signal crayfish	American mink
Asian topmouth gudgeon	Ruffe	Canadian pond weed
Ruddy duck	Bullhead	Japanese knotweed
Didemnum spp	Mitten crab	Himalayan balsam
Wireweed	Slipper limpet	Giant hogweed
Water primrose	Zebra mussel	Rhododendron
	Australian swamp stonecrop	Rainbow trout
	Large flowered waterweed	Red vent syndrome (RVS)
	Curly waterweed	Orfe
		Nuttal's pondweed
		Water fern
		Common cord grass
		Fanwort
		Floating pennywort
		Parrot's feather

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

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 9. The actions required to establish and maintain the RRM are presented in Section 5.2.

Table 9 - 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 existing INNS which are operational and sustainable.

Output 3.1 – Effective sustainable control/eradication programmes are established and operational.

Surveys have largely identified INNS distributions within the Annan Catchment. Survey information has been entered onto GIS and analysed to target upstream extent of 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 RAT staff will be used depending on the management requirements of the area involved. Envisaged mitigation, eradication and control measures for the INNS present in the River Annan catchments are presented in Table 10.

The actions required to establish the proposed control/eradication programme are presented in section 5.2

In order to achieve these aims additional manpower will be required to help project manage eradication works. An INNS project officer was employed in April 2010 with funding sourced through SEPA, LEADER and Pattersons Quarries. Further support will be received from the Criminal Justice Service who will supply community service groups for Himalayan balsam control.

Other clearance and control work will be carried out by RAT and RADSFB staff who will be fully trained in spraying techniques and the safe use of pesticide near a water course. Additionally the profile of INN species will be raised amongst landowners and the general public providing further support for the control of INN species.

The training of RAT and RADSFB staff and the purchasing of equipment for the project will give the RAT the capacity to monitor and control INNS once the main eradication works have been completed.

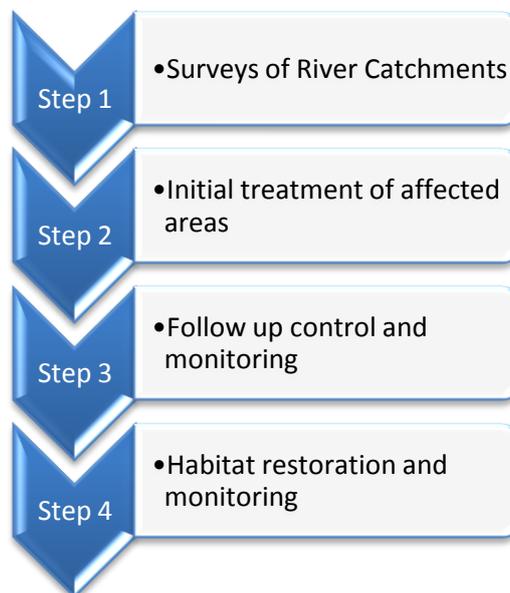


Table 10 - Phase 1 of Invasive Non-Native Species Control and Eradication in the Annan District

SPECIES	ACTION	TREATMENT/POST TREATMENT ACTIONS
Japanese knotweed (JK)	Control/Eradication Identify and close pathways.	-Stem Injection and knapsack sprayers to be used and a comparison between the effectiveness of the two methods made. -Monitor catchment for activation of dormant sources of infestation -Habitat restoration if required
Himalayan balsam (HB)	Control/Eradication Identify pathways and close	-Continue with CJS labour to clear Three Waters Meet of balsam. - Handpull/mow prior to seed development -Monitor catchment for activation of dormant sources of infestation -Habitat restoration if required
American mink	Control/Eradication	-Continue monitoring and trapping programme -Continue to contribute to water vole monitoring and mink trapping on the River Annan project
Rhododendron (R)	Control / Eradication	-Monitor distribution and plan future control work

 **Output 3.2 A locally based, fully resourced organisation is established to implement non-government actions specified within the Annan District Biosecurity Plan.**

The employment of an INNS project officer hosted by the RADSFB / RAT would provide manpower to help project manage prevention and control activities in the region. RADSFB and RAT staff will also contribute to control work increasing the resources available.

The following issues would require support from stakeholders and interested parties to ensure they are effectively delivered:

- Promoting awareness of the impacts of INNS to all stakeholders
- Development of the 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 the effectiveness of all measures implemented 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 this approach are presented in Section 5.2.

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. Those identified as 'lead' or 'partner' organisations include those that are acting solely in an advisory capacity.

Table 11 - Required actions, lead agency, key partners and timeframe according to objective and output

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

Action	Lead	Partners	TIMEFRAME								
			2010	2011	2011	2012	2012	2013	2014	2015	2016
Objective 1: Reduce the risk of introduction and spread of INNS within the Annan fisheries district.											
Output 1.1: All key stakeholders aware of the ecological and economic impacts of INNS, means of introduction and spread as well as management best practices.											
Launch of Annan Biosecurity plan through national and local press release	RAT	SEPA		—							
Produce leaflet on legislation including waste management & planning regulations	Local councils	AAG, SNH, SEPA			—	—					
Produce leaflet on biosecurity risks and the reporting system	RAT /RAFTS	AAG, SNH	—								
Produce posters on biosecurity risks and distribute to the general public	RAFTS	RAT, AAG, Local Councils		.....	.....	.....	.....	.....	.....	.....	.....
Continue to promote and install disinfection facilities for anglers at all angling proprietors fishing huts/parking points	RAT	RADSFB		.....	.....	.....	.....	.....	.....	.....	.....
Develop interim code of practice with Harbour Authority	Port Authorities	RAT			—	—					
Distribute Codes and posters to relevant retail outlets and clubs at open days and events such as agricultural shows	Local Councils	SNH AAG members			.....	.....	.....	.....	.....	.....	.....

Action	Lead	Partners	TIMEFRAME									
			2010	2011	2011	2012	2012	2013	2014	2015	2016	
Engage with Landowners and angling clubs to promote awareness of measures to tenants, resource – users, members and visitors	RADSFB & RAT	SEPA, SNH	—————									
Work with environmental groups and local schools to enhance awareness of INNS	RAT	SNH		.....							
Objective 2: Develop optimum detection and surveillance of, and rapid response to, new INN species which pose a significant threat to local biodiversity and the economy.												
Output 2.1: ‘Early warning system’ established for new and existing INNS in the district.												
Train RAT personnel in the identification of INNS	RAT /RAFTS	SEPA, LEADER	—————									
Train RAT as trainers	RAT	RAFTS		———								
Work with user and interest groups to identify “monitors”	RAT	SEPA, AAG			—————							
Training of “monitors”	RAT	RAFTS, SEPA			—————			———	———	———	———	
Manage database to record and manage INNS reports	RAT, DGERC	RAFTS, SEPA (national)		———								
Monitor and periodically evaluate efficacy of system	RAT & other partners			.....							
Output 2.2: Rapid response mechanism (RRM) established for new INNS which pose significant threats to local biodiversity and economy.												
Formulate contingency plans for key species	RAFTS & RAT	Local councils, SEPA, SNH		—————								
Identification of personnel for response teams	RAT	Local Council, SEPA and SNH	———									
Training of personnel to execute contingency plans	RAT	Local Council, SEPA and SNH	———									
Identification of funding resources	RAT	Local Council, AAG, SNH, RAFTS	.....								
Refresher training	RAT	RAFTS				———	———	———	———	———		
Monitor populations/treated areas	RAT	SEPA		.....							

Action	Lead	Partners	TIMEFRAME								
			2010	2011	2011	2012	2012	2013	2014	2015	2016
Objective 3: Develop effective control and eradication programmes for existing INNS which are operational and sustainable.											
Output 3.1: Effective sustainable control/eradication programmes are established and operational.											
Initiate and complete catchment wide surveys by trained personnel	RAT	SFCC	—————								
Develop GIS database for recording and mapping INNS within the Annan district	RAT	SFCC		———							
Continuation of mink eradication programme	RAT	SEPA	-----	-----	-----	-----	-----	-----	-----	-----	
Implementation of phase 1 of control/eradication programme see table 10 for details of proposed works	RAT	Angling clubs, landowners, SEPA, CJS	-----	-----	-----	-----	-----	-----	-----	-----	
Implement habitat restoration scheme within successful control areas taking into account all relevant species	RAT	Local Council, SEPA ³⁰			-----	-----	-----	-----	-----	-----	
Monitor the effectiveness of control programmes	RAT			-----	-----	-----	-----	-----	-----	-----	
Output 3.2 – A locally based, fully resourced organisation is established to implement non-government actions specified within the Annan District Biosecurity Plan.											
Complete draft Biosecurity plan	RAT		———								
Consultation with all stakeholders to agree Biosecurity plan	RAT	All		———							
Consult with representatives from all stakeholder groups	RAT	All		—————							
Identify and develop opportunities for future funding of eradication projects	RAT	AAG, SNH, LEADER, Landtrust		-----	-----	-----	-----	-----	-----	-----	

³⁰ May be eligible for funding from the Restoration Fund

6. MONITORING

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

To ensure the effective implementation of this plan, it is vital that the outcomes and impacts of the actions are monitored and reviewed to ensure that the objectives are being met. Thus a 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 treatment has been ineffective
 - 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 RAT 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.