Ayrshire Catchments Bio-Security Plan

2009-2015

Prepared by

Ayrshire Rivers Trust

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Registered Scottish Charity SC030421

- ## What is Biosecurity?

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

- ## What are Invasive Non Native Species?

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

Abbreviations

Abbreviation	Organisation
ART	Ayrshire Rivers Trust
ASSG	Association of Scottish Shellfish Growers
BTA	British Trout Association
DSFBs	District Salmon Fisheries Boards
FCS	Forestry Commission Scotland
MS	Marine Scotland
NNSS	Non Native Species Secretariat
RAFTS	Rivers and Fisheries Trusts of Scotland
SEPA	Scottish Environment Protection Agency
SFCC	Scottish Fisheries Co-ordination Centre
SG	Scottish Government
SNH	Scottish Natural Heritage
SSPO	Scottish Salmon Producers' Organisation
TWG	Tripartite Working Group

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EXECUTIVE SUMMARY

This plan describes the catchment biosecurity issues identified within Ayrshire and presents actions that have been agreed with stakeholders for the prevention, early detection, control and mitigation of the introduction and spread of selected invasive non native species (INNS) and fish diseases. This vision of this plan is:

'To establish a sustainable framework which will prevent, detect, control and eradicate invasive non-native species within the Ayrshire Rivers Trust area 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 risk introduction of new INNS within the Ayrshire District.

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

Objective 2: Establish optimum surveillance, detection, monitoring and rapid response systems for the 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*

Output 2.2 *Rapid response mechanism established for new INN species 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 *Control, eradication and habitat restoration programmes established and operational*

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

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

- 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 of local landscapes.
- A holistic, cost effective control programme of INN plants e.g. Giant Hogweed (*Heracleum mantegazzianum*), Japanese Knotweed (*Fallopia japonica*), and Himalayan Balsam (*Impatiens glandulifera*), the former being a threat to human health, will be founded in partnership with key stakeholders.
- The conservation of important natural habitats for native species such as Otter (*Lutra lutra*), Atlantic salmon (*Salmo salar*), Freshwater Pearl Mussel (*Margaritifera margaritifera*), European Eel (Anguilla anguilla).
- The prevention of the salmon parasite *Gyrodactylus salaris* from entering the Ayrshire district which would avoid catastrophic economic and environmental loss.
- Prevention/ control of American Signal Crayfish (*Pacifastacus leniusculus*).

- The protection of the endangered water vole from predation by the American Mink (*Mustela vison*).
- Helping to ensure the outcome of INNS management in the Ayrshire 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 table 1 below.

Table 1: Timeframes and actions

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

ACTION	LEAD	PARTNERS	TIMEFRAME 2010	2010	2011	2011	2012	2012	2013	2014	2015
Objective 1: Reduce the risk of introduction of new INNS within the Ayrshire District.											
Output 1.1: Key stakeholders aware of the impacts and measures required to prevent their introduction and spread											
Launch ART Biosecurity plan through national and local – create press release	ART		—								
Produce leaflet on legislation including waste management & planning regulations	North, South and East Ayrshire councils	SNH, AAG		—	—						
Produce leaflet on biosecurity risks and the reporting system	ART	SNH, AAG		—							
Produce posters on biosecurity risks and distribute.	ART	RAFTS, SNH, AAG, Plantlife		·····	·····	·····	·····	·····	·····	·····	·····
Continue to promote and install disinfection facilities for anglers at all angling proprietors fishing huts/parking points	ART	DSFBs	·····	·····	·····	·····	·····	·····	·····	·····	·····
Develop interim code of practice with all Harbour Authorities, Ports and Marinas	Ayrshire Port Authorities & Marinas	ART		—	—						
Distribute Codes and posters to relevant retail outlets and clubs at open days and events such as agricultural shows	North, South and East Ayrshire councils	SNH, AAGs			·····	·····	·····	·····	·····	·····	·····
Engage with landowners and angling clubs to promote awareness measures to tenants, resource users, members and visitors	ART	SNH, SEPA		—	—						
Work with environmental groups & local schools to enhance awareness of INNS	ART	SNH			·····	·····	·····	·····	·····	·····	·····
Objective 2: Establish optimum early surveillance, detection, monitoring and rapid response systems for the 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.											
Train three ART personnel in the identification of INNS	ART	SNH, RAFTS	—								
Train ART staff as trainers	ART	SNH, RAFTS		—							
Work with user and interest groups to identify monitors	ART			—	—						
Training of monitors	ART	SNH, SEPA		—	—		·····	·····	·····	·····	·····
Maintain database to record and manage INNS reports	ART	RAFTS		—							

ACTION	LEAD	PARTNERS	TIMEFRAME								
			2010	2010	2011	2011	2012	2012	2013	2014	2015
Establish, test and refine communication mechanisms within surveillance system	ART	RAFTS, SEPA (National)		—	—						
Monitor and periodically evaluate efficacy of surveillance system	ART	RAFTS		·····	·····	·····	·····	·····	·····	·····	·····
Output 2.2 Rapid response mechanism established for new INN species which pose significant threats to local biodiversity and economy.											
Formulate contingency plans	ART	Local Councils, SEPA and SNH		—	—						
Identification of personnel	ART	Local Councils, SEPA and SNH		—	—						
Training of personnel	ART	Local Councils, SEPA and SNH		—	—						
Identification of funding resources	ART	Local Councils, AAG and SNH		·····	·····	·····	·····	·····	·····	·····	·····
Acquisition of equipment	ART	Local Councils	—								
Refresher training	ART				·····	·····	·····	·····	·····	·····	·····
Establish local communications systems	ART	Local Councils, SEPA and SNH		—	—						
Monitor population	ART	SEPA		·····	·····	·····	·····	·····	·····	·····	·····
<u>Objective 3:</u> Develop effective control and eradication programmes for existing INNS which are operational and sustainable.											
Output 3.1 Effective sustainable control/eradication programmes within the Ayrshire District are established and fully functional											
Initiate and complete catchment wide surveys by trained personnel	ART				—	—					
Establish GIS database for recording and mapping INNS within Ayrshire district	ART	RAFTS	—								
Implementation of phase 1 of INNS control/ eradication programme	ART	Angling clubs, Landowners, SNH, SEPA[1]	·····	·····	·····						
Implementation of habitat restoration scheme within successful control areas taking into account all relevant species	ART	Angling clubs, Landowners, SNH, SEPA[2]			·····	·····	·····	·····	·····	·····	·····
Monitor the effectiveness of control programmes	ART			·····	·····	·····	·····	·····	·····	·····	·····
Identify and develop opportunities for future funding of eradication projects	ART	AAG			·····	·····	·····	·····	·····	·····	·····
Output 3.2 A locally based, fully resourced organisation is established to implement non-government actions specified within the Ayrshire District Biosecurity Plan.											
Complete draft biosecurity plan	ART		—								
Consult with all stakeholders to agree biosecurity plan	ART	All	—								
Consult with representatives from all stakeholder groups	ART	All	—	—							
Identify and develop opportunities for future funding of eradication projects	ART	AAG SNH			·····	·····	·····	·····	·····	·····	·····

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

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

SECTION 1 PURPOSE AND SCOPE

This plan describes the biosecurity issues associated with aquatic and riparian habitats within Ayrshire catchments and presents actions that have been agreed with stakeholders for the prevention, early detection, control and mitigation of the introduction and spread of selected invasive non native species (INNS) and fish diseases. This vision of this plan is:

'To establish a sustainable framework which will prevent, detect, control and eradicate invasive non-native species within the Ayrshire Rivers Trust area through appropriate management, data collection, liaison and education"

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

> **Objective 1:** Reduce the risk introduction of new INNS within Ayrshire.
>
> **Objective 2:** Establish optimum surveillance, detection, monitoring and rapid response systems for the identified 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.

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[3]:

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

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

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

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

- The maintenance and enhancement of biodiversity – biotic invasion is one of the top five drivers for global biodiversity loss and is increasing with globalisation and tourism
- The visual conservation of local landscapes

[3] www.nonnativespecies.org

- A holistic, cost effective control programme of INN plants e.g. Giant hogweed, Japanese knotweed, and Himalayan balsam, the former being a threat to human health, will be founded in partnership with key stakeholders.
- The conservation of important natural habitats for native species such as Otter, Atlantic salmon, freshwater pearl mussel and European eel,
- The prevention of the salmon parasite *Gyrodactylus salaris* from entering Ayrshire rivers which would avoid catastrophic economic and environmental loss.
- The prevention of the introduction of signal crayfish.
- The protection of the endangered water vole from predation by the American Mink

SECTION 2 BACKGROUND

Although prepared by the Ayrshire Rivers Trust (ART), this plan is one of a set of 20 biosecurity plans being produced throughout Scotland as part of a national programme of action implemented through the Rivers and Fishery Trusts of Scotland (RAFTS) with backing and support from the Scottish Government, Scottish Natural Heritage (SNH), Scottish Environment Protection Agency (SEPA) and the Esmée Fairbairn Foundation.

Ayrshire Rivers Trust (ART) is a registered Scottish Charity with the following mission statement:

To preserve a valuable part of our natural heritage for the enjoyment of current and future generations, through the conservation, enhancement and development of our freshwater habitats for the benefit and fisheries they support.

ART considers that the preparation and implementation of this biosecurity plan is an essential step in the delivery of its mission statement. The ART Fishery Management Plan highlights the importance of biosecurity planning in relation to the Trust's objectives.

The need for action on biosecurity issues has been identified in the Trust's Fisheries Management Plan[4], the Draft Clyde River Basin Area Management Plan[5] being prepared as part of the River Basin Management Plan[6] 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 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

[4] http://www.ayrshireriverstrust.org/documents.htm
[5] http://www.sepa.org.uk/water/river_basin_planning/area_advisory_planning/clyde
[6] http://www.sepa.org.uk/water/river_basin_planning.aspx

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 ART 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 ART, stakeholders and appropriate regulatory agencies in Ayrshire for the prevention, early detection and control of riparian non native invasive species, fish diseases and parasites. This plan will also facilitate coordination and communication with the neighbouring fisheries Trusts, Boards, local authorities and other stakeholders of neighbouring areas e.g Galloway, Clyde and Argyll.

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 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 non native invasive species, parasites and diseases in Scotland and the UK. In the context of this first plan, biosecurity issues in the rivers and lochs of Scotland are considered in relation to the potential introduction and spread of a priority list of INNS and fish diseases.

According to a survey[7] commissioned by Scottish Natural Heritage in 2001, 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 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.

Invasive non native species are the second greatest threat to biodiversity being capable of rapidly colonising a wide range of habitats and excluding the native flora and fauna (CBD, 2006[8]). 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

[7] www.snh.org.uk/pdfs/publications/review/139.pdf
[8] http://www.cbd.int/gbo2/

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[9] have estimated that INNS cost the UK economy at least £2 billion per year
- In the UK Japanese knotweed is thought to affect an area roughly the size of London and the report of the Review of Non-Native Species Policy (2003)[10] has estimated the total cost of its removal using current techniques at £1.56bn.
- A Scottish Government report[11] 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[12] estimates the current cost of clearing the invasive *Rhododendron ponticum* from Argyll and Bute as £9.3m that could rise to £64m in the next 50 years.
- Invasive species have already changed the character of iconic landscapes and waterbodies in Scotland reducing the amenity value of those areas.

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

Without some form of coordinated and systematic approach to the prevention of introduction and control of the spread of INNS and fish diseases, it is likely that the ecological, social and economic impacts and the costs for mitigation, control and eradication of these species and diseases will continue to increase. This plan is a first attempt to set out and implement such an approach at a local level for selected species and diseases[13] that

[9] http://www.defra.gov.uk/wildlife-countryside/wildlife-manage/non-native/index.htm

[10] http://www.defra.gov.uk/wildlife-countryside/pdf/wildlife-manage/non-native/review-report.pdf

[11] www.scotland.gov.uk/resource/doc/1062/0042434.pdf

[12] http://www.forestresearch.gov.uk/pdf/Argyll_Bute_rhododendron_2008_costs.pdf/$FILE/Argyll_Bute_rhododendron_2008_costs.pdf

[13] www.invasivespeciesscotland.org.uk

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 in Ayrshire. These approaches are consistent with the GB Invasive Non Native Species Framework Strategy[14] and the Species Action Framework[15] both of which have been approved by the Scottish Government.

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

- Section 14 of The Wildlife and Countryside Act (1981)[16] makes it an offence to allow any animal (including hybrids) which is 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 where it is considered a statutory nuisance.

- Section 179 of the Town and Country Planning (Scotland) Act 1997[17] 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[18] regulates the use of pesticides and herbicides for the control and eradication of INNS.

- Environmental Protection Act 1990[19] 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 classified as

[14] www.nonnativespecies.org
[15] www.sng.org.uk/speciesactionframework
[16] www.opsi.gov.uk/RevisedStatutes/Acts/ukpga/1981/cukpga_19810069_en_1
[17] www.opsi.gov.uk/acts/acts1997/ukpga_19970008_en_1
[18] www.opsi.gov.uk/legislation/scotland/ssi2005/20050066.htm
[19] www.opsi.gov.uk/acts/acts1990/ukpga_19900043_en_1

controlled waste. This means that offences exist with the deposit, treating, keeping or disposing of controlled waste without a licence.

- The Waste Management Licensing Regulations 1994[20] define the licensing requirements which include "waste relevant objectives". These require that waste is recovered or disposed of "without endangering human health and without using processes or methods which could harm the environment".

- Controlled Waste (Registration of Carriers and Seizure of Vehicles) Regulations 1991[21] and the Environmental Protection (Duty of Care) Regulations 1991[22] provide guidance for the handling and transfer of controlled waste.

- The Aquaculture & Fisheries (Scotland) Act 2007[23] that regulates against the unauthorised introduction of fish to inland waters.

- The Prohibition of Keeping or Release of Live Fish (Specified Species) Order 2003[24] requires that a licence be obtained for the keeping or release of species listed on Schedules 1 and 2.

- The NetRegs[25] 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[26] 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-led policy, legislation and strategic action with local actions and reflects, implement and/or supports the provisions and requirements of the following existing plans (see also Table 2):

- the ART Fisheries Management Plan,
- the Clyde Area and River Basin District Management Plan,
- the Ayrshire Local Biodiversity Action Plans

Furthermore, this plan supports the conservation objectives of twelve SSSI's and one SAC conservation areas within Ayrshire.

[20] http://www.opsi.gov.uk/si/si1994/uksi_19941056_en_1.htm
[21] www.opsi.gov.uk/si/si1991/Uksi_19911624_en_1.htm
[22] www.opsi.gov.uk/si/si1991/uksi_19912839_en_1.htm
[23] http://www.opsi.gov.uk/legislation/scotland/acts2007/asp_20070012_en_1
[24] http://www.scotland.gov.uk/resource/doc/47133/0009766.pdf
[25] http://www.netregs.gov.uk/netregs/default.aspx
[26] http://www.scotland.gov.uk/marinescotland

Table 2 Identified Actions in the ART Biosecurity Plan supporting provisions or requirements of other relevant plans

Provision or Requirement of Existing Plan	Action in Biosecurity Plan
The RBMP for Scotland and the **Clyde Area Management Plan**[27] • identification of appropriate actions to manage species that threaten high and good status sites, together with identification of potential sources of re-infestation in the surrounding area; • establishment of detection /surveillance /control strategies for problem species; • risk assessment of pathways for entry of problem species into the Scotland river basin district; • research and development to define species causing deterioration of good ecological status/ potential and to identify new methods of control; and • development of biosecurity plans to prevent movement of species between catchments and respond quickly to new infestations	RBMPs 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: • 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
ART Fisheries Management Plan[28] Highlighted ▪ The need for biosecurity planning ▪ Need for surveys, subsequently completed	This biosecurity plan fulfills the identified need for biosecurity planning and the other identified biosecurity measures in the Fisheries Management Plan
***Gyrodactylus salaris* (Gs) Contingency Plan**:[29] 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
Ayrshire Biodiversity Action Plan[30] Acknowledges the threat from non-native species to native biodiversity	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
Plans supporting designated conservation areas (SACs and SSSIs). Scotland's Biodiversity: A strategy for the conservation and enhancement of biodiversity in Scotland. [31]	Supports the conservation of biodiversity target species through the control and eradictaion of INNS detrimental to their ecology

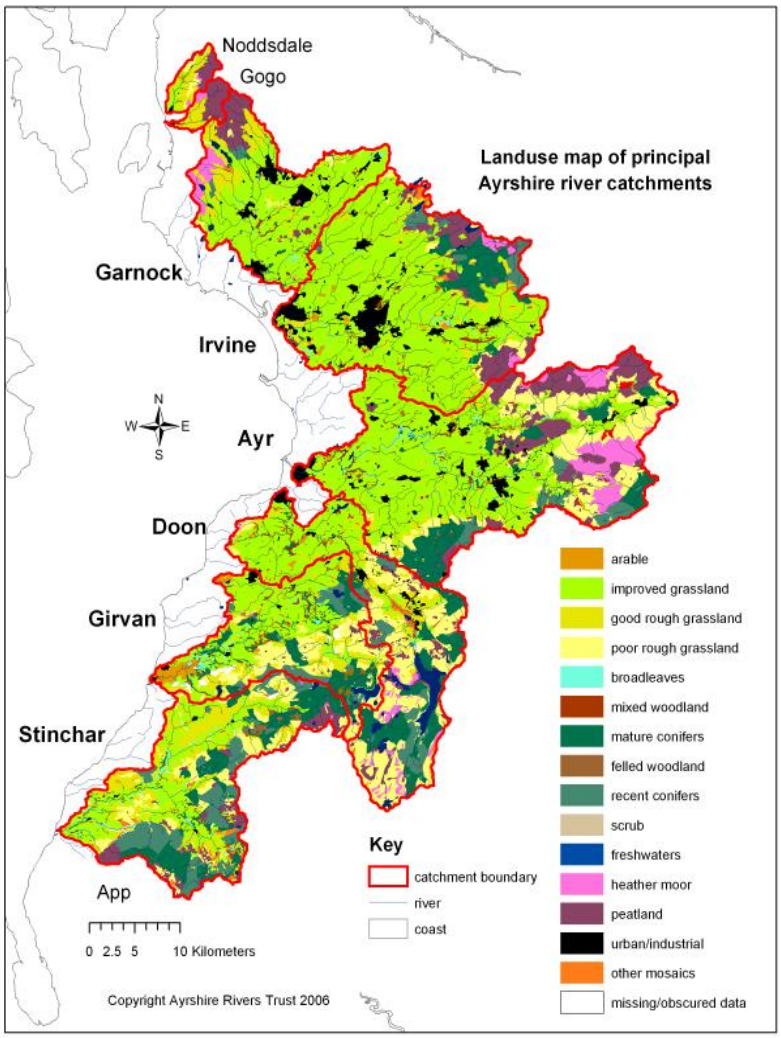
[27] www.sepa.org.uk/water/river_basin_planning.aspx
[28] www.rafts.org.uk/projects/fisheriesmanagementplanning.asp
[29] www.scotland.gov.uk/Topics/Fisheries/Fish-Shellfish/18610/diseases/g-salaris/GsCGrev
[30] http://www.south-ayrshire.gov.uk/sustainable-development/lbap.aspx
[31] www.scotland.gov.uk/Publications/2004/05/19366/37239

SECTION 4 BIOSECURITY ISSUES IN AYRSHIRE

4.1 Description of the ART area

There are six major catchments within the Ayrshire Rivers Trust area: the Garnock, Irvine, Ayr, Doon, Girvan and Stinchar. There are also a number of smaller coastal burns flowing directly into the Firth of Clyde. Within the area covered by Ayrshire Rivers Trust[32] there are four District Salmon Fishery Boards, serving the Stinchar, Girvan, Doon and Ayr. Land use within the six major Ayrshire river catchments is detailed in ***map 1*** below.

Map 1. *Principal Land use within Ayrshire river catchments*



[32] (Note. The Water of App is an Ayrshire river. Management for this watercourse however, is currently the responsibility of Galloway Fisheries Trust and for this reason the App catchment has been excluded from the Ayrshire Biosecurity Plan)

The **River Garnock** is the smallest of Ayrshire's rivers at 39 km in length with a catchment size of 238km^2. Its major tributary is the Lugton Water. The average flow is 8.1 m^3/s and it joins the sea in an estuary it shares with River Irvine. The dominant land uses in the catchment are agricultural, moorland and urban development. It contains low forestry cover and 74% of the land is improved or good rough grassland.

The **River Irvine** has the second largest catchment in Ayrshire with an area of over 380 sq km. The river itself is 42km in length. The River Irvine has been highly modified with urban development. There are many tributaries including the Annick Water, Cessnock Water and Glen Water. Agriculture, forestry and urban development are the main land uses. Due to diffuse pollution pressures within the catchment area, water quality suffers. The Irvine has the highest human population density of all the Ayrshire catchments and the second highest human density of any salmon river in Scotland after the River Clyde.

The **River Ayr** is the largest river in Ayrshire with the length of the main stem being over 63km. The catchment measures 574 sq km, with a number of major tributaries including the Greenock Water, Lugar Water, Water of Fail and Water of Coyle. It has an average flow of 16 m^3/s. The principal land uses are agricultural, forestry and mineral extraction, with a concentration of dairy farms in lowland parts of the catchment. The river passes through many towns and villages and contains three Sites of Special Scientific Interest (SSSI). The Ayr catchment is also one of the main areas in Scotland for opencast coal mining.

The **River Doon** stretches for a distance of 58km including Loch Doon. Loch Doon is dammed to store water for the Galloway Hydro-Electric power scheme. The river itself starts below the dam with a steady compensation flow of 45million gallons/day. The catchment area is 324 sq km and the river runs past several villages including Dalmellington, Patna and Dalrymple. The River Doon supports great biodiversity interest with populations of freshwater water pearl mussels (*Margaritifera margaritifera*) and Saucer Bugs (*Aphelocheirus aestivalis*). There are four SSSI's within its catchment: Loch Doon, Ness Glen, Bogton Loch and Dalmellington Moss. In the lowland parts of the catchment the dominant land use is agricultural with extensive areas of rough grazing and conifer plantations in the higher altitude areas.

The **River Girvan** is approximately 40 km in length with a catchment area of 250 sq km and an average flow of 6.1 m^3/s. The River Girvan flows through Straiton, Crosshill and Dailly before entering the sea at Girvan. Upstream of Kirkmichael area, the river is fast flowing with many rocky and turbulent sections. Catchment land uses include commercial forestry and rough grazing.

The River Stinchar is 46km in length and has a catchment area of 314 sq km. The Stinchar contains one SSSI situated near the mouth of the Stinchar on the gravel banks for the nesting birds. There is relatively little intensive agriculture and has excellent overall water quality. There are four main tributaries: Muck water, Duisk, Water of Assel and Water of Tig. The Stinchar runs through Barr, Pinwherry, Colmonell and Ballantrae**.**

4.2 Use of the Catchment

There are numerous types of land use and businesses spread throughout the district, varying from large scale including agriculture, forestry, tourism, industry (e.g. chemical works, oil supply) and other commercial interests (e.g. quarries, fishing ports and harbours, garden centres, pet shops, sawmills, distilleries, hospitals and drinking water suppliers). 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[33] of the economic impact of game and coarse angling in Scotland 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 Central 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.

Table 3 Angler expenditure table (£ 000s) for Central Scotland

Fishery	Value (£ 000s)
Salmon & sea trout	£3,386
Brown trout	£5,234
Rainbow trout	£10,963
Coarse fish	£1,930
Total	**£21,513**

4.3 Biosecurity – current and potential threats

Twenty nine INNS and fish diseases have been included in the ART Biosecurity Plan of which fourteen are high priority species which will be the main focus for action. These high priority species were identified as those that:

- Already exist within the ART 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 Ayrshire area are associated with nine INNS:

- American mink is present in all of the six Ayrshire catchments. Mink spread by migration and kill water fowl, small mammals and juvenile fish. Mink are linked to the

[33] http://www.scotland.gov.uk/Publications/2004/06/19506/38879

decline of water voles in the Ayrshire area with 94% of sites occupied by water voles in the 1950s are now unoccupied.

- Giant hogweed is widespread and is present in large areas of the Ayrshire catchments. Spreads through seed dispersal and the movement of soil contaminated by its 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. (See distribution map 2 below)

- Japanese knotweed is extensively located throughout the main Ayrshire catchments. 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. (See distribution map 2 below)

- Himalayan balsam is present in five of the six rivers in the Ayrshire catchments and coastal rivers. 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. (See distribution map 2 below)

- Rhododendron is present in many locations throughout the middle and lower Ayrshire and coastal river catchments. 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.

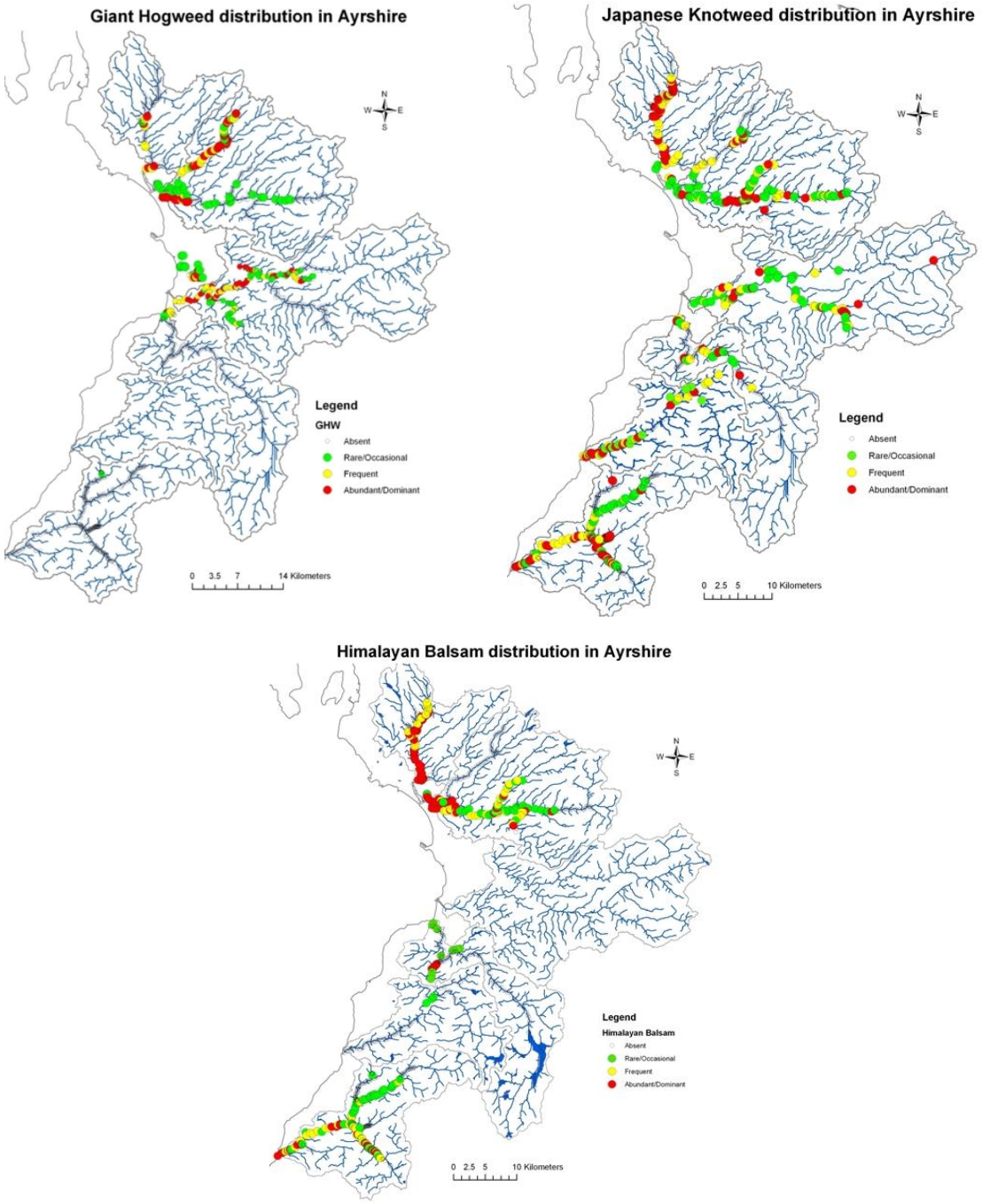
- Canadian pondweed *(Elodea canadensis)* is present in various locations throughout the Ayrshire district. It is spread by disposal of plants or plant fragments near waterways, escapes from garden ponds during flood episodes and possibly by birds and other animals. Canadian pondweed can dominate native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

- Nuttall's pondweed (*Elodea nutallii*) is present in locations within the catchment of Ayrshire. It spreads through escapes form garden ponds, through garden waste and by birds and animals. It dominates native macrophyte communities which can lead to their extinction and removes metals from sediments and releases them into the water

- Water fern (*Azolla filiculoides*) is present in small areas of Ayrshire. Introduced through garden and aquaria centres therefore also pond waste. Water fern forms dense rafts out competing native plant species. It deoxygenates the water column and can also cause blocking leading to an increased risk of flooding.

- Wireweed (*Sargassum muticum*) is present in a small area of Ayrshire. Introduced through fouling of boats and other marine equipment. Grows at a rapid rate of up to 10cm per day. Reproduces both sexually and via floating fragments. Forms monospecific mats reducing light to understory native species and reduces flow.

Map2. *Distribution of 3 Invasive Weed Species in Ayrshire river catchments*



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

Table 4 High Threat level species their impacts and risk of introduction

SPECIES	RISK OF INTRODUCTION	LOCAL IMPACTS
North American signal crayfish (*Pacifastacus leniusculus*)	**High –** deliberate introduction by aquariums and others through: ▪ use of fish food ▪ stocked fish ▪ intended for food in restaurants	▪ Eradication of indigenous species ▪ Impacts on other species and habitats including fish and invertebrates
Zebra mussel (*Dreissena polymorpha)* Freshwater Bivalve	**High-**through unintentional introduction from contaminated boat hulls and engines and bilge water.	▪ Major economic impact on all subsurface water structures e.g. blocking pipes and impacting 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
Slipper limpet (*Crepidula fornicata*)	**High** – through unintentional introduction from contaminated boat hulls.	▪ Inhabits shallow sub tidal area below water mark ▪ Exclude other bivalves including oysters to whose beds they are a serious threat
Gyrodactylus salaris (Freshwater external parasite of salmon)	**High**- Through unintentional introduction from anglers and water sport enthusiasts through: ▪ contaminated fish ▪ clothing/equipment Ballast water	▪ Projected catastrophic impact on salmon *(Salmo salar)* populations throughout Scotland. (It has largely exterminated *S. salar* in 41 Norwegian rivers)
Common cord-grass (*Spartina anglica)*	**High –** through natural dispersal by seed and expansion if rhizomes, seeds can remain dormant for several years.	▪ creates monospecific stands in the upper intertidal areas, reducing feeding areas for bird species

There are also thirteen Medium Threat level species of which there is a medium risk of introduction for seven species and a low risk for six species (see Table 5 below).

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

SPECIES		RISK OF INTRODUCTION
Australian swamp stonecrop (*Crassula helmsii*)	**Medium**	Unintentional introduction from ponds
Curly water weed (*Lagarosiphon major*)	**Medium**	Unintentional introduction from garden centres
Ruffe *(Gymnocephalus cernuus)*	**Medium**	Currently recorded in central Scotland and could be introduced as live bait or in ballast water
Water primrose (*Ludwigia grandiflora*)	**Medium**	Present in NW England so could be translocated
Parrot's feather *(Myriophyllum aquaticum)*	**Medium**	Through intentional/unintentional introduction from two existing populations in the south of Scotland
Large flowered waterweed *(Egeria densa)*	**Medium**	

SPECIES		RISK OF INTRODUCTION
Chinese mitten crab (*Eriocheir sinensis*)	**Medium**	Only found to date in East Lothian. Possible introduction from ponds Unintentional introduction from boat ballast water and hull fouling
Floating pennywort *(Hydrocotyle ranunculoides)*	**Low**	Currently only in England up to the midlands. Possible introduction from ponds
Fanwort *(Cabomba caroliniana)*	**Low**	Only found in one location in southern Scotland possible introduction from ponds
Ruddy duck *(Oxyura jamaicensis)*	**Low**	Could migrate from a number of locations in eastern Scotland
Orfe *(Leuciscus idus)*	**Low**	Through intentional/unintentional introduction from an existing population nearby.
Didemnum Tunicates/Sea squirts (*Didemnum vexillum, Didemnum spp*)	**Low**	Unintentional introduction through fouling of ocean going vessels
Asian Topmouth Gudgeon (*Pseudorasbora parva*)	**Low**	Introduction through use of fish bait

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

- Intentional introduction 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:

- Scottish Government
- Ayrshire's Local Councils
- Forestry Commission
- Scottish Natural Heritage (SNH)
- Scottish Environmental Protection Agency (SEPA)South West Region
- Ayrshire Local Biodiversity Action Plan Group
- Scottish Wildlife Trust

- Royal Society for the Protection of Birds

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 Ayrshire

Pathway	Stakeholders
Intentional introduction or planting	Local Councils and Planning departments
Fouling and ballast water of marine vessels	Local Port Authorities/SEPA
Fouling and ballast water of freshwater vessels	Local Port Authorities/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	Ayrshire District Salmon Fisheries Boards/Marine Scotland
Escapes from fish farms, ponds, gardens, demesnes.	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 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

ART have completed invasive weeds surveys across all the major catchments in Ayrshire. These surveys form a baseline and provide data for the development of strategic control of the major invasive riparian plants. Following the survey of the River Ayr strategic control of Giant hogweed in the upper catchment began in 2007. ART are working with the local authorities to coordinate control of riparian weeds and a seminar was held in 2008 to disseminate information collect during surveys. The Ayrshire DSFB's have been active in raising awareness of the risks posed by *Gyrodactylus salaris* including leaflets and signage.

Other organisations, e.g. SWT have been involved in manual control of Himalayan balsam with their reserve in the lower River Garnock.

SECTION 5 BIOSECURITY MANAGEMENT STRATEGY

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

Objective 1: ***Reduce the risk introduction of new INNS within the Ayrshire District.***

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

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

- 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,
    - Estimated to 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 Ayrshire District. The key stakeholders, the identified areas of priority and the 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 is 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
Local fish farms	- Inform fish farms of the Impact of INNS and how they spread -Dangers of importing from contaminated areas - Use of proper screens and other biosecurity measures -Need for controls on movement of stock and water	- ART to liaise with local industry and trade associations to advise members regularly of best practice in respect of INNS -Invasive Species Scotland[34] website - Marine Scotland Fish Health Inspectors to discuss with fish farms during audits
Local Port Authorities and Marinas	- Avoid pumping out of non sterilised ballast water in harbour - Role of hull fouling in the introduction and spread of INNS	- Promote implementation of code of practice requiring non-sterilised ballast water to be discharged away from harbour . -ART to assist with the supply of posters and other awareness material for display and signage. -Invasive Species Scotland website
Local Garden Centres	-Educate trade buyers to avoid stocking invasive species -Promotion of 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.	ART 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	-ART to work with retailers to encourage distribution of codes and posters (available from Plantlife) ART to provide guidance on website for dealing with unwanted fish or plants
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 monitors for ART	-ART 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	- Promote knowledge of biosecurity issues amongst all tenants and resource users - Identification of suitable persons to act as monitors for ART	-DSFB's and Improvement Associations to work with ART to ensure dissemination of best practices and appropriate signage to reduce threats from INNS -ART to offer training for monitors -Invasive Species Scotland website

[34] www.invasivespeciesscotland.org.uk

Stakeholder Group	Priority Area	Mechanism of Delivery
Angling clubs	- 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 monitors	-Local AC's work with ART to ensure dissemination of best practices and appropriate signage to reduce threats from INNS -ART to work with associations to promote disinfection of equipment and provide appropriate facilities to eliminate the risk of accidental transfer of INNS -ART to offer training for monitors -Invasive Species Scotland website
General Public	- General awareness of impacts and measures to prevent/control INNS	-Local Media Campaigns -Use of websites (RAFTS, INNS, ART) -ART 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
Contractors / Ground Maintenance Workers	- General awareness of impacts and measures to prevent/control INNS	- ART to work with industry bodies to ensure dissemination of best practices - ART 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 focusing on ecological clubs and encouraging appropriate field trips

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

Stakeholder Group	Priority Action	Mechanism of Delivery
ART	- Promote awareness to general water users promoting the Biosecurity Plan and highlighting the dangers from INNS	- 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 ART above
District Salmon Fishery Boards & Improvement Associations	-Continue to promote awareness of management issues and threats arising from INNS to anglers and angling clubs. 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.
Local Councils: North, South and East Ayrshire 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	- Councils to promote codes of best practice at every opportunity e.g. including INNS guidance within planning application responses / guidelines and building warrants - Production (by Council's legal department) and distribution of information leaflets on all relevant legislation relevant to INNS

Stakeholder Group	Priority Action	Mechanism of Delivery
	local business - Promote awareness of the GB INNS Framework strategy to the general public -Encourage responsibility within Local Authorities for the control of all NNIS on public land.	-Holding of awareness event/open days to promote biosecurity issues - Display posters (produced by RAFTS) in council offices, libraries and other public places -Issue NNIS Identification and guidance cards to appropriate council employees
SEPA	- Clarify SEPA responsibilities for INNS to both staff and customers - Incorporate INNS issues into relevant guidance documents (as they are developed or updated)	- Page on website with links to relevant SEPA information and other sites e.g. Non-Native Species Secretariat, RAFTS, and Scottish Canoe Association. - Digital documents available for download on SEPA Website
SNH	-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. - SNH part funded this biosecurity plan. This survey will inform any catchment/tributary scale operations in relation to INNS issues.
Marine Scotland	-Fish Health Inspectorate part of Marine Scotland is lead body with respect of 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 Ayrshire District. The actions are presented in Section 5.2 along with the responsible agency and a timeframe for their implementation.

<u>Objective 2:</u> Establish optimum early surveillance, detection, monitoring and rapid response systems for the 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 monitors of the early warning system will be trained members of the public, bailiffs, ghillies, canoeists and walkers with reported sightings verified by trained ART personnel. A sighting of a 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 priority species will be verified as time permits. All verified sightings will also be entered onto the ART Geographic Information System to monitor INNS distributions

within the Ayrshire District and reported to the Ayrshire Biological Records database (ABR). Actions to establish the reporting system are presented in Section 5.2.

Output 2.2: Rapid response mechanism established for new INN species which pose significant threats to local biodiversity and economy.

The type of rapid response will depend on the species detected (Table 10) and proportionate to 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 9 Response level for the 32 invasive non-native species

GB Response	High Priority Local Response	Priority Local Response
Gyrodactylus salaris	American signal crayfish	American mink
Asian Topmouth Gudgeon	Australian swamp stonecrop	*Anasakis sp.*
Ruddy duck	Zebra mussel	Bullhead
Didemnum spp		Canadian pond weed
Wireweed		Common cord grass
Water primrose		Curly waterweed
		Fanwort
		Floating pennywort
		Giant hogweed
		Himalayan balsam
		Japanese knotweed
		Large flowered waterweed
		Minnows
		Mitten crab
		Nuttal's pond weed
		Orfe
		Parrot's feather
		Rainbow Trout
		Rhododendron
		Ruffe
		Slipper limpet
		Stone loach
		Water fern

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 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 for local level contingency plans

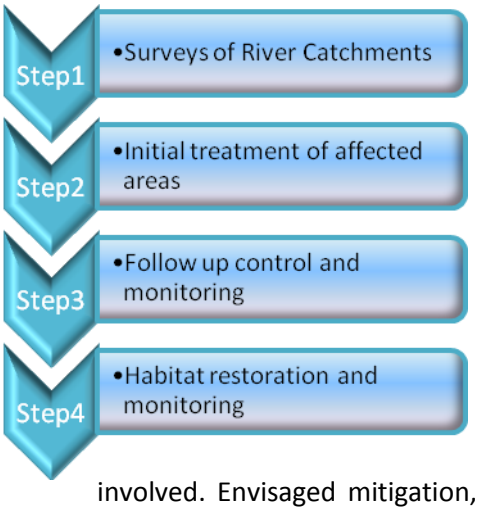
for local priority species. The elements to be included in the response to detection of a GB priority species or the contingency plans for local priority species are outlined in Table 10. Actions to establish the RRM are presented in Section 5.2.

Table 10 Elements of contingency plans or protocols for response to GB priority, local high priority and priority species

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

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

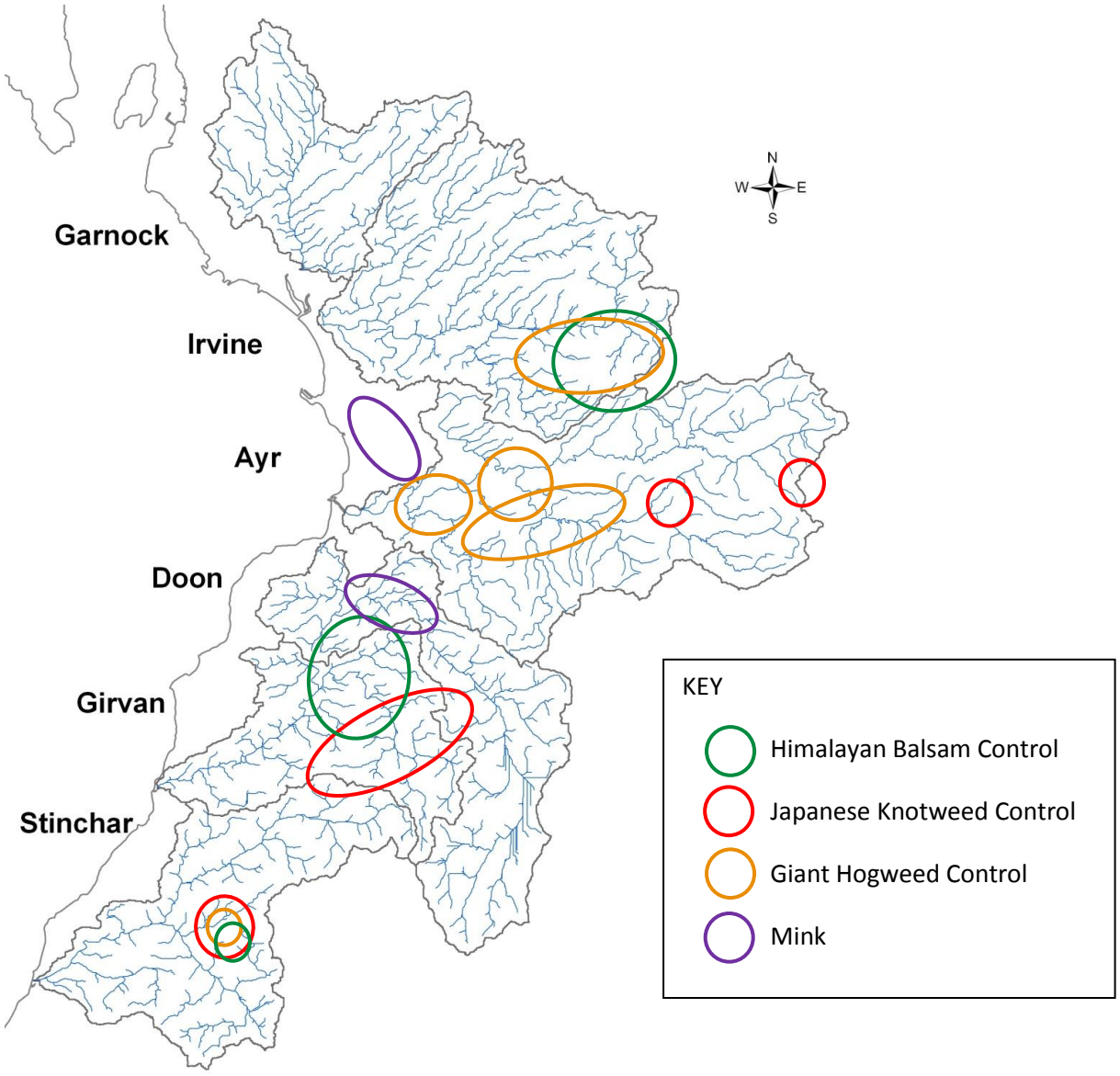
Output 3.1 Control, eradication and habitat restoration programmes established and operational.



Surveys will identify INNS distributions within the Ayrshire 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, generally with treatment commencing at the upstream point of distribution and then systematically progressing downstream (see Map below). A combination of specialist contractors, volunteers and ART staff will be used depending on the management requirements of the area involved. Envisaged mitigation, eradication and control measures for the 10 INNS present in the Ayrshire catchment are presented in Table 11.

ART has identified priorities for control of particular INNS and these are illustrated in maps 3 & 4 below. Strategic response designed to limit the spread of or eradicate new or establishing species (where possible) will greatly reduce the long term impact and cost associated with delayed action.

Map 3. *Non Native Species planned control activities for 2010 within Ayrshire river catchments (phase 1)*



Map 4. *Non Native Species control planned for 2011-2016.*

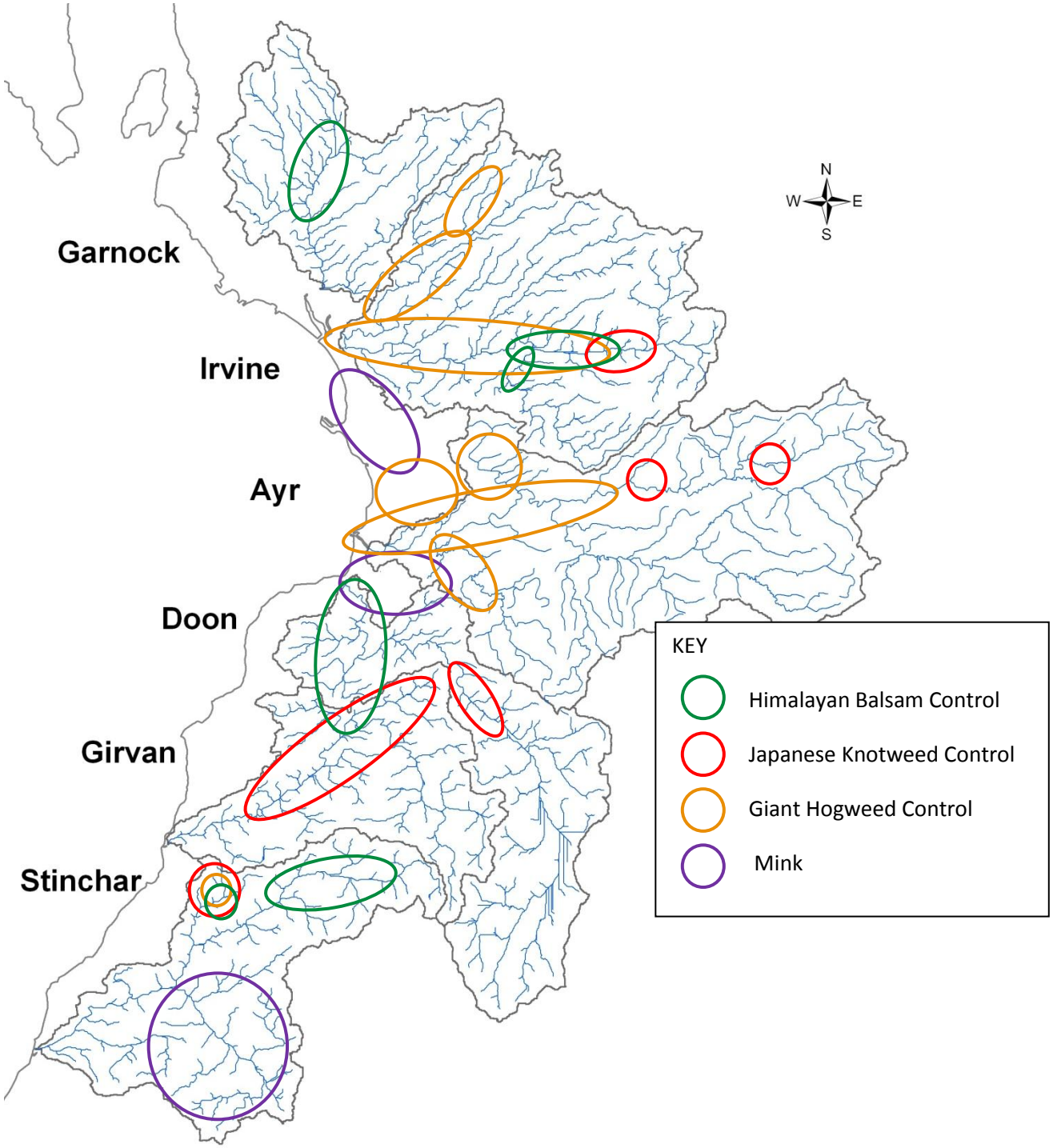

Garnock
Irvine
Ayr
Doon
Girvan
Stinchar
N
W
E
S
KEY
Himalayan Balsam Control
Japanese Knotweed Control
Giant Hogweed Control
Mink

Table 11 Invasive Non Native Species Control and Eradication in the Ayrshire District

SPECIES	ACTION	TREATMENT/POST TREATMENT ACTIONS
American mink	Control	Commence localised trapping programme
Canadian pond weed	Monitor distribution	
Giant hogweed	Control/Eradication Identify and close pathways	Spray large areas with Glycophosate (aquatic roundup) three times in year 1; repeat as required. Stem injection is also an option for low density stands. Monitor catchment for activation of dormant sources of infestation Habitat restoration if required
Himalayan balsam	Control/Eradication Identify and close pathways	Hand pull / Mow prior to seed development Monitor catchment for activation of dormant sources of infestation Habitat restoration if required
Japanese knotweed	Control/Eradication Identify and close pathways.	Leaf spraying with Glycophosate (aquatic roundup) by contractors for large stands with follow up of stem injection treatment to maintain control. Stem injection for smaller stands and individual plants. Requirements for riparian zone habitat restoration assessed and implemented. The use of biological control methods e.g. the psyllid *Apalara itadori* may be useful in controlling this plant in future.
Minnow	Monitor distribution	
Nuttal's pond weed	Monitor distribution	
Red vent syndrome	Monitor occurrence	
Rhododendron	Monitor distribution	
Stone loach	Monitor distribution	
Water Fern	Monitor distribution	

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

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

The sustainable and effective implementation of biosecurity measures at the local level would be facilitated by including Biosecurity within the Local Biodiversity Action Plan. The Ayrshire LBAP partners meet regularly and the inclusion of INNS within the group's remit should meet the aims of the LBAP by conserving local biodiversity. Ayrshire Rivers Trust would lead on Biosecurity issues with input from LBAP partners. ART would plan and coordinate activities on behalf of all stakeholders within the Ayrshire District, reporting directly to LBAP partners at the regular meetings.

The remit of ART on behalf of the Ayrshire LBAP would effectively be the implementation of this Biosecurity Plan for the Ayrshire District. This would also require support from the partners and stakeholders to ensure the following issues were 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

This section 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.

Table 12 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	2010	2011	2011	2012	2012	2013	2014	2015
Objective 1: Reduce the risk of introduction of new INNS within the Ayrshire District.											
Output 1.1: Key stakeholders aware of the impacts and measures required to prevent their introduction and spread											
Launch ART Biosecurity plan through national and local – create press release	ART		—								
Produce leaflet on legislation including waste management & planning regulations	North, South and East Ayrshire councils	SNH, AAG		—	—						
Produce leaflet on biosecurity risks and the reporting system	ART	SNH, AAG		—							
Produce posters on biosecurity risks and distribute.	ART	RAFTS, SNH, AAG, Plantlife		⋯	⋯	⋯	⋯	⋯	⋯	⋯	⋯
Continue to promote and install disinfection facilities for anglers at all angling proprietors fishing huts/parking points	ART	DSFBs	⋯	⋯	⋯	⋯	⋯	⋯	⋯	⋯	⋯
Develop interim code of practice with all Harbour Authorities, Ports and Marinas	Ayrshire Port Authorities & Marinas	ART		—	—						
Distribute Codes and posters to relevant retail outlets and clubs at open days and events such as agricultural shows	North, South and East Ayrshire councils	SNH, AAGs			⋯	⋯	⋯	⋯	⋯	⋯	⋯

ACTION	LEAD	PARTNERS	TIMEFRAME								
			2010	2010	2011	2011	2012	2012	2013	2014	2015
Engage with landowners and angling clubs to promote awareness measures to tenants, resource users, members and visitors	ART	SNH, SEPA									
Work with environmental groups & local schools to enhance awareness of INNS	ART	SNH									
Objective 2: Establish optimum early surveillance, detection, monitoring and rapid response systems for the 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.											
Train three ART personnel in the identification of INNS	ART	SNH, RAFTS									
Train ART staff as trainers	ART	SNH, RAFTS									
Work with user and interest groups to identify monitors	ART										
Training of monitors	ART	SNH, SEPA									
Maintain database to record and manage INNS reports	ART	RAFTS									
Establish, test and refine communication mechanisms within surveillance system	ART	RAFTS, SEPA (National)									
Monitor and periodically evaluate efficacy of surveillance system	ART	RAFTS									
Output 2.2 Rapid response mechanism established for new INN species which pose significant threats to local biodiversity and economy.											
Formulate contingency plans	ART	Local Councils, SEPA and SNH									
Identification of personnel	ART	Local Councils, SEPA and SNH									
Training of personnel	ART	Local Councils, SEPA and SNH									
Identification of funding resources	ART	Local Councils, AAG and SNH									
Acquisition of equipment	ART	Local Councils									
Refresher training	ART										
Establish local communications systems	ART	Local Councils, SEPA and SNH									
Monitor population	ART	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 within the Ayrshire District are established and fully functional											
Initiate and complete catchment wide surveys by trained personnel	ART										
Establish GIS database for recording and mapping INNS within Ayrshire district	ART	RAFTS									
Implementation of phase 1 of INNS control/ eradication programme	ART	Angling clubs, Landowners, SNH, SEPA[35]									

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

ACTION	LEAD	PARTNERS	TIMEFRAME								
			2010	2010	2011	2011	2012	2012	2013	2014	2015
Implementation of habitat restoration scheme within successful control areas taking into account all relevant species	ART	Angling clubs, Landowners, SNH, SEPA[36]			.....	.....	.....	.....	.....	.....	.....
Monitor the effectiveness of control programmes	ART			.....	.....	.....	.....	.....	.....	.....	.....
Identify and develop opportunities for future funding of eradication projects	ART	AAG			.....	.....	.....	.....	.....	.....	.....
Output 3.2 A locally based, fully resourced organisation is established to implement non-government actions specified within the Ayrshire District Biosecurity Plan.											
Complete draft biosecurity plan	ART		—								
Consult with all stakeholders to agree biosecurity plan	ART	All	—								
Consult with representatives from all stakeholder groups	ART	All	——								
Identify and develop opportunities for future funding of eradication projects	ART	AAG SNH			.....	.....	.....	.....	.....	.....	.....

SECTION 6 MONITORING

Biosecurity planning has been initiated within the Ayrshire Area by ART 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 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 the selected INNS within the Ayrshire area
- 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 and investigation of any apparent resistance to treatments
    - Surveillance of 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.

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

- Reviewing the contents Biosecurity Plan and the progress of the actions contained within.

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