Cumbria Freshwater Biosecurity Plan

2011 – 2015

Prepared on behalf of the

Cumbria Freshwater Invasive Non-Native Species Initiative

VERSION 1

December 20th 2011

THE RIVERS TRUST
where there's water there's life
The new name for the Association of Rivers Trusts

Cumbria Freshwater Invasive Non-Native Species Initiative

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

Foreword

All species are perfectly good components of this planet's rich diversity of life forms but awareness of the potentially serious impacts of introducing species to ecosystems they are not naturally a part of is growing rapidly. Although only a relatively a small number of these 'non-native' species become "invasive" in their new environment, the problems these can cause mostly develop slowly or subtly and in time can become serious and irreversible. In the freshwater environment, the species themselves can become established very quickly...saddling landowners, businesses and many others with on-going costs. A key aspect of the approach to this problem is therefore to prevent their introduction and to get better at acting quickly if they do appear.

Biosecurity is therefore an essential part of this and if we genuinely care about our wildlife, habitats and general environment, we need to act responsibly in exercising our many freedoms to enjoy exotic species or to use the environment for so many different purposes. Good biosecurity practices can bring lasting ecological and economic benefits and doing the right things to protect the environment we care for should ideally become second nature...often they are not hugely challenging things, just good sensible behavioural precautions.

Quite apart from the ecological impacts, a study of the economic impacts of invasive non-native species in Britain clearly demonstrated the sheer breadth of interests that are currently affected...and which add up to the current cost of £1.7 billion every year. DEFRA therefore warmly welcomes this plan which demonstrates that with the right attitudes and approaches, we can very clearly mesh the GB Strategy's approach at national level and county-based strategic activity in an effective "Russian doll" way. The clear thread of continuity and consistency between the GB Strategy and this Freshwater Biosecurity Plan in terms of partnership, monitoring, detection, reporting and management is an obvious strength. Similarly, national campaigns like "Be Plant Wise" and "Stop the Spread/Check, Clean, Dry" are developed with the input of stakeholder partners, so their strength also lies in further cascading consistent messages and advice closer and closer to the end users by initiatives like CFINNS.

In a high profile part of the country like Cumbria, which attracts so many annual visitors who come to appreciate and enjoy its natural beauty, CFINNS and its partners are presented with a great opportunity to showcase their approach to addressing the invasive non-native species problem. This is an opportunity to influence not only the people who live and work in the area but also people who come from well beyond Cumbria's boundaries. We wish the project every success.

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Species Policy, DEFRA.

Trevor Renals

Senior Technical Advisor, Invasive Species,

Environment Agency.

Definitions

What is Biosecurity?

Biosecurity literally means ‘safe life’. It refers to taking action in order to minimise the risk or prevent the movement or transmission of invasive non-native species and diseases.

What are Invasive Non Native Species?

Invasive non-native species (INNS) are those that have been transported outside of their natural range and that can damage our environment, environmental services, the economy, our health and the way we live. Impacts of INNS are so significant, they are considered to be one of the greatest threats to biodiversity worldwide. They threaten the survival of rare native species and damage sensitive ecosystems and habitats.

Abbreviations of the partners

Abbreviation	Organisation
AT	Angling Trust
BTCV	British Trust for Conservation Volunteers
CFINNS	Cumbria Freshwater Invasive Non-Native Species Initiative
CBP	Cumbria Biodiversity Partnership
CBDC	Cumbria Biodiversity Data Centre
CCC	Cumbria County Council
CWT	Cumbria Wildlife Trust
DEFRA	Department of Environment Food and Rural Affairs
DISG	Derwent Invasive Species Group
DOA	Derwent Owners Association
EA	Environment Agency
ERT	Eden Rivers Trust
EISG	Eden Invasive Species Group
FOTLD	Friends of the Lake District
FBA	Freshwater Biological Association
FWAG	Farming and Wildlife Advisory Group
FC	Forestry Commission
KIPG	Kent Invasive Plant Group
LWUF	Lake Windermere Users Forum
LDNP	Lake District National Park
LRT	Lune Rivers Trust
NT	National Trust
NE	Natural England
NL	Nurture Lakeland
RAFTS	Rivers and Fisheries Trusts of Scotland
RSPB	Royal Society for the Protection of Birds
SCRT	South Cumbria Rivers Trust
SFA	South Furness Anglers

SATA	Salmon and Trout Association
RT	The Rivers Trust
UU	United Utilities
UOC	University of Cumbria
US	Ullswater Steamers
WCRT	West Cumbria Rivers Trust
WLC	Windermere Lake Cruises
WISG	Windermere Invasive Species Group

Credits

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Executive Summary

This Biosecurity Plan addresses freshwater and riparian invasive non-native species (FINNS) in the county of Cumbria. It describes freshwater biosecurity issues in the county and presents actions for the prevention, early detection, control and mitigation of the introduction and spread of FINNS, diseases and parasites.

The Cumbria Freshwater Invasive Non-Native Species Initiative is one of two pilot county-wide and multi-catchment Initiatives (the other being the Norfolk Non-Native Species Initiative) sponsored by DEFRA through Natural England. There are also several catchment-wide projects throughout the UK, including those currently working within the Derwent, Eden, Windermere and Kent catchments in Cumbria.

The Cumbria Freshwater Biosecurity Plan has been developed for the county-wide coordination of local actions. Our vision in this plan is:

'To develop a sustainable county-wide management framework that will prevent the introduction of, or detect, control and/or eradicate specified FINNS throughout Cumbria.

This vision will be achieved through the realisation of a range of objectives which are in accordance with the Invasive Non Native Species Framework Strategy for Great Britain[1] and established protocols for notifiable fish diseases.

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

The table below presents the actions required to realise the objectives and outputs along with the timeframe required for their implementation.

[1] www.nonnativespecies.org

Table 1: County-wide timeframes and actions**:**

Solid line indicates short–term action Dotted line indicates long-term ongoing effort

ACTION	TIMEFRAME								
	2011	2012	2012	2013	2013	2014	2014	2015	2015
Objective 1: Reduce the risk of the introduction and spread of FINNS and fish / crayfish diseases within each catchment of Cumbria									
Output 1.1 – All partners and specific high risk groups aware of the ecological and economic impacts of FINNS, means of introduction, preventative measures and spread as well as management best practices.									
Launch and promotion of Biosecurity plan through national and local press and through website links									
Launch and raise awareness of campaign – 'check clean dry' - through national and local press and through website links									
Produce and disseminate 'check clean dry' campaign leaflets, posters, press releases, website information, wallet cards and presentations on biosecurity risks and the reporting system									
Promotion of 'check clean dry' campaign to canoeists, boaters and anglers at water entry points and parking points, fishing huts and parking points, relevant retail outlets, open days and agricultural shows									
Engage with and promote awareness of FINNS (Be plant wise campaign) with garden centres and aquatic suppliers in the county									
Work with environmental groups, schools, organisations and partners in order to enhance awareness of FINNS									
Promote the use of disinfection/wash down stations to Marinas throughout the county									
Liaise with and work alongside neighbouring counties to monitor distribution of FINNS									
Produce leaflet on management best practices and legislation including waste management & planning regulations									
Develop relationships with high risk groups (anglers, canoeists etc) to raise awareness and meet the objectives									
Liaise with DEFRA nationally									

ACTION	TIMEFRAME								
	2011	2012	2012	2013	2013	2014	2014	2015	2015
Objective 2: Develop and establish detection and surveillance of, and rapid response mechanism to new incidences of specified FINNS.									
Output 2.1 - Early warning and reporting system established for new FINNS in Cumbria.									
Identify and locate appropriate experts in specific FINNS									
Train personnel in the identification of FINNS from each catchment									
Train the personnel to act as trainers themselves									
Work with user and interest groups to identify "reporting network"									
Train members of "reporting network"									
Produce database to manage FINNS records from surveys									
Establish, test and refine communication mechanisms within 'early warning' system									
Monitor and periodically evaluate efficacy of system									
Liaise with rapid response teams in national organisations such as EA									
Output 2.2 – Develop strategic monitoring of FINNS.									
Determine the objectives, priorities and frequency of monitoring									
Develop and agree protocols									
Produce database to manage FINNS survey data									
Train personnel in monitoring methods from each catchment									
Develop monitoring manual									
Output 2.3 – Rapid response mechanism established for new FINNS that pose significant threats to local biodiversity and economy.									
Identification of high priority FINNS county wide									
Agree rapid response mechanisms and contingency plans for high priority FINNS									
Agree organisations responsible for high priority FINNS									
Establish quality control of process i.e. that personnel are being trained to execute contingency plans									
Establish quality control of process in which funding resources are identified									
Establish quality control of process in which refresher training is organised									
Establish quality control of process in which populations and treated areas are monitored									
Objective 3: Prioritisation, control or eradication of existing populations of specified FINNS									

ACTION	TIMEFRAME								
	2011	2012	2012	2013	2013	2014	2014	2015	2015
Output 3.1 – Coordinated control or eradication and habitat restoration programmes established and operational									
Carry out risk assessments for local high priority species and existing populations of specified FINNS									
Initiate and complete catchment wide surveys by suitably trained personnel									
Establish contacts for expert advice on identification and management for specific FINNS									
Identify and implement methods of monitoring and restricting the spread of FINNS where no adequate control mechanisms are currently in place									
Produce database to manage FINNS records for control works									
Implement control programmes for specific established FINNS at a catchment level									
Implement habitat restoration scheme within successful control areas taking into account all relevant species at a catchment level									
Monitor the effectiveness of control programmes									
Identify and develop opportunities for future funding of eradication projects									
<u>Objective 4:</u> Establish a sustainable management framework to coordinate actions of local and catchment based partners									
Output 4.1 – Local organisations and partners implementing coordinated management actions									
Complete draft Cumbria Freshwater Biosecurity Plan									
Consult with all partners of the Cumbria Forum to confirm actions in Cumbria Freshwater Biosecurity Plan									
CFINNS Initiative Coordinator post embedded within SCRT									
Establish good communication between national, county and local partners									
Establish a county-wide education programme to raise awareness of FINNS									
Secure sustainable funding for CFINNS Coordinator post and LAGs for actions to implement the Cumbria Freshwater Biosecurity Plan									

ACTION	TIMEFRAME								
	2011	2012	2012	2013	2013	2014	2014	2015	2015
Establish strategic work programmes and employ seasonal catchment INNS Officers	.....								
Disseminate best practice and new developments relating to FINNS to/between LAGs	.....								
Identify needs and support building capacity for new LAGs	.....								

Table 2: Catchment-wide timeframes and actions**:**

/ Solid line indicates short–term action ..... Dotted line indicates long-term ongoing effort

ACTION	TIMEFRAME								
	2011	2012	2012	2013	2013	2014	2014	2015	2015
<u>Objective 1:</u> Reduce the risk of the introduction and spread of FINNS and fish / crayfish diseases within each catchment of Cumbria									
Output 1.1 – All partners and specific high risk groups aware of the ecological and economic impacts of FINNS, means of introduction, preventative measures and spread as well as management best practices.									
Promotion of 'check clean dry' campaign to canoeists, boaters and anglers at water entry points and parking points, fishing huts and parking points, relevant retail outlets, open days and agricultural shows	.....								
Work with environmental groups, schools, organisations and partners in order to enhance awareness of FINNS		.....							
Develop relationships with high risk groups (anglers, canoeists etc) to raise awareness and meet the objectives	.....								
<u>Objective 2:</u> Develop and establish detection and surveillance of, and rapid response mechanism to new incidences of specified FINNS.									
Output 2.1 - Early warning and reporting system established for new FINNS in Cumbria.									
Train the personnel to act as trainers themselves			/	/					
Work with user and interest groups to identify "reporting network"		/	/						
Train members of "reporting network"			/	/					
Output 2.2 – Develop strategic monitoring of FINNS.									
Determine the objectives, priorities and frequency of monitoring		/	/						
Train personnel in monitoring methods from each catchment		/	/	/					

ACTION	TIMEFRAME								
	2011	2012	2012	2013	2013	2014	2014	2015	2015
Output 2.3 – Rapid response mechanism established for new FINNS that pose significant threats to local biodiversity and economy.									
Develop rapid response mechanisms and contingency plans for high priority FINNS		.....	.....	.....	.....	.....	.....	.....	.....
Agree organisations responsible for high priority FINNS		———	———						
Objective 3: Prioritisation, control or eradication of existing populations of specified FINNS									
Output 3.1 – Coordinated control or eradication and habitat restoration programmes established and operational									
Carry out risk assessments for local high priority species and existing populations of specified FINNS		———	———						
Initiate and complete catchment wide surveys by suitably trained personnel		.....	.....	.....	.....	.....	.....	.....	.....
Identify and implement methods of monitoring and restricting the spread of FINNS where no adequate control mechanisms are currently in place		.....	.....	.....	.....	.....	.....	.....	.....
Implement control programmes for specific established FINNS at a catchment level	.....	.....	.....	.....	.....	.....	.....	.....	.....
Implement habitat restoration scheme within successful control areas taking into account all relevant species at a catchment level			.....	.....	.....	.....	.....	.....	.....
Objective 4: Establish a sustainable management framework to coordinate actions of local and catchment based partners									
Output 4.1 – Local organisations and partners implementing coordinated management actions									
Consult with all partners of the Cumbria Forum to confirm actions in Cumbria Freshwater Biosecurity Plan	———	———							
Establish good communication between national, county and local partners	.....	.....	.....	.....	.....	.....	.....	.....	.....
Secure sustainable funding for CFINNS Coordinator post and LAGs for actions to implement the Cumbria Freshwater Biosecurity Plan	.....	.....	.....	.....	.....	.....	.....	.....	.....
Establish strategic work programmes and employ seasonal catchment INNS Officers	.....	.....	.....	.....	.....	.....	.....	.....	.....
Identify needs and support building capacity for LAGs	.....	.....	.....	.....	.....	.....	.....	.....	.....

1. Scope and Purpose

This plan describes the biosecurity issues associated with aquatic and riparian habitats within the county of Cumbria and presents actions that have been agreed with Initiative partners and others for the prevention, early detection, control and mitigation of the introduction and spread of selected FINNS, diseases and parasites. Our vision in this plan is:

'To develop a sustainable county-wide management framework that will detect, control and/or eradicate, where present, specified Freshwater Invasive Non Native Species throughout Cumbria through the coordination of data collection, education and local action'

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

Objective 1: Reduce the risk of the introduction and spread of FINNS and selected diseases within each catchment in Cumbria.

- *Output 1.1 – All partners and specific high risk groups aware of the ecological and economic impacts of FINNS, means of introduction and spread as well as best management control practices*

Objective 2: Develop and establish detection and surveillance of, and rapid response mechanisms to new incidences of specified FINNS.

- *Output 2.1 – Early warning and reporting system established for new FINNS in Cumbria.*
- *Output 2.2 – Develop strategic monitoring of FINNS.*
- *Output 2.3 – Rapid response mechanism established for new FINNS that pose significant threats to local biodiversity and economy.*

Objective 3: Prioritisation, control or eradication of existing populations of specified FINNS.

- *Output 3.1: Coordinated control or eradication and habitat restoration programmes established and operational.*

Objective 4: Establish a sustainable management framework to coordinate actions of local and catchment based partners

- *Output 4.1 – Local organisations and partners implementing coordinated management actions.*

These objectives are in accordance with the three elements of the Invasive Non Native Species Framework Strategy for Great Britain[2].

- 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 in order to ensure the success and long term sustainability of the actions presented.

The implementation of this biosecurity plan will bring many environmental and socio-economic benefits. A summary of these is given below;

- Increased and safeguarded biodiversity and the conservation of internationally and nationally designated rivers, lakes and wetlands.
- Contribution to the achievement of Good Ecological Status in waterbodies across Cumbria through addressing Water Framework Directive actions.
- Visual conservation and increased amenity value of local landscapes, especially with respect to the improved control of FINNS where for example these currently impede access or degrade visual impact.
- Collaborative control of existing widespread species such as Japanese knotweed, Himalayan balsam and giant hogweed all of which can have adverse economic impacts.
- Protection of the major stronghold in England of the white-clawed crayfish from the establishment of the Signal crayfish.
- Prevention of the crayfish plague (*Aphanomyces astaci*) entering Cumbrian waters and causing extinction of native white-clawed crayfish populations.
- Prevention of the salmon parasite *Gyrodactylus salaris* entering Cumbrian waters which would cause catastrophic environmental and economic loss.
- Protection of the endangered water vole and ground nesting birds from American mink.
- Reduction of the risk of plant FINNS clogging water systems and impacting biodiversity, water abstraction, the boating industry, angling and tourism in the county.
- Prevention of new FINNS such as the zebra mussel, killer shrimp and floating pennywort becoming established. .

[2] www.nonnativespecies.org

2. Background

The need for a strategic, coordinated approach to management of FINNS was recognised by Natural England in 2007. Two county-wide invasive species Fora were created in Norfolk and Cumbria, and stakeholder meetings were held in 2007 and 2008. Following these, the Cumbria Freshwater Invasive Non-Native Species (CFINNS) Initiative was launched in its current form with the appointment of the county coordinator in April 2010. The Initiative is currently funded by Natural England and the Environment Agency, although broader funding was envisaged at the time of the initial Forum meetings. The Coordinator is employed through the South Cumbria Rivers Trust.

Following the recent success of the Biosecurity plans developed by the Rivers and Fisheries Trust Scotland (RAFTS), the Rivers Trusts (RT) and RAFTS have collaborated in the development of two Biosecurity Plans in England. The CFINNS Initiative was chosen to lead with the Biosecurity Plan for Cumbria as a pilot for a potential national programme of action. The CFINNS Initiative members consider that the preparation and implementation of this Biosecurity Plan is essential in order to complete the objectives of the Initiative.

This plan provides a basis for local action to address Cumbria's freshwater and riparian biosecurity issues. It has an adaptive lifespan of five years and, its outcomes and impacts will be reviewed and incorporated into subsequent versions of the plan. Although it is not a legal instrument *per se*, it utilises existing legal and regulatory instruments. As such the implementation of this plan will rely on the formation of strong local partnerships founded on solid legal and policy principles by interested parties.

The plan has been produced through the CFINNS Initiative in which the Cumbria Forum identified and agreed the aims, outputs and actions documented here. The plan proposes partnerships in order to address the complex issues associated with freshwater biosecurity. It therefore represents the agreed approach of the CFINNS Initiative for the prevention, early detection and control of FINNS, diseases and parasites. As the spread of FINNS is not isolated to the county of Cumbria this plan will also facilitate coordination and communication with neighbouring county projects.

3. The Context

3.1 Freshwater Invasive Non-Native Species: the Nature of the Problem

FINNS are of increasing ecological and economic significance. Natural barriers to the movement of species such as oceans and mountains have meant that unique ecosystems have developed throughout the world. The modern phenomenon of globalisation has expanded the possibilities, extent and complexity of world trade which along with the growth of tourism has expanded hugely the movements of people, commodities and products. This has increased unintentional and intentional introductions of species outside their natural range, and establishment of FINNS away from their co-evolved competitors and predators.

In this plan, biosecurity issues in the Cumbrian rivers and lakes are considered in relation to the potential introduction and spread of a priority list of FINNS, diseases and parasites (see Section 4.2).

There are thousands of non-native species in the UK, only a minority of which are invasive. It is this small but significant number of INNS that has a major impact on the native flora and fauna.

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

According to the Convention on Biological Diversity (2006)[3], INNS are the second greatest threat to biodiversity, being capable of 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 those 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 lakes and their banks and shorelines are among the most vulnerable areas for the introduction, spread and impact of these species. The ecological changes wrought by FINNS can further threaten already endangered native species and reduce the natural productivity and amenity value of affected habitats.

The threat from FINNS is growing at an increasing rate exacerbated by climate change, pollution and habitat disturbance with a correspondingly greater socio-economic, health and ecological cost. Many countries including the UK are now facing complex and costly problems associated with invasive species:

- CABI have estimated that INNS cost the British economy £1.7 billion per year [4]
- In the UK Japanese knotweed is thought to affect an area roughly the size of London and in the Review of Non-Native Species Policy (2003)[5] it was estimated that the total cost of its removal in 2003 using available techniques was £1.56 billion.
- The most recent estimate in 2008[6] for the whole country for the control, management and disposal of floating pennywort was £1.93 million.

[3] http://www.cbd.int/invasive/
[4] https://secure.fera.defra.gov.uk/nonnativespecies/index.cfm?sectionid=59
[5] https://secure.fera.defra.gov.uk/nonnativespecies/index.cfm?sectionid=59
[6] Newman, quoted in EPPO 2010

Without some form of coordinated and systematic approach to the prevention of introduction and control of the spread of FINNS, diseases and parasites, it is inevitable 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 to set out (and implement) such an approach at a county level for FINNS and diseases that significantly affect the freshwater and riparian environment.

Given the high cost estimates for the mitigation, control and eradication of FINNS and diseases once they are established, this plan emphasises the need for prevention and rapid response to the introduction of FINNS **before** they become established. Furthermore, the multiplicity of pathways for entry and spread as well as the persistence of many of these species means that a partnership approach involving diverse partners to prevent introductions is essential. It emphasises the requirement for increased public awareness and engagement, optimisation of the use of resources and the provision of clear guidance necessary to address the freshwater biosecurity issues in Cumbria. It is also consistent with the GB Invasive Non Native Species Framework Strategy[7]

3.2 Policy and Legislation

The UK has international obligations to address FINNS issues, principally through the Water Framework Directive and the EU Habitats and Birds Directives, the Convention of Biological Diversity including the International Plant Protection Convention and the Bern Convention on Conservation of European Wildlife and Habitats.

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

- Section 14 of The Wildlife and Countryside Act (1981)[8] makes it an offence to allow any animal (including hybrids) which is not ordinarily resident in Great Britain, to escape into the wild; or release it into the wild; or to release or to allow to escape from captivity, any animals that is listed on Schedule 9 of the 1981 Act. It is also an offence to plant or otherwise cause to grow in the wild any plant listed on Schedule 9 of the 1981 Act. This list was expanded in March 2010 and now includes many of the country's most problematic aquatic and riparian INNS. See Appendix 3.

- The Environmental Protection Act 1990[9] contains a number of legal provisions concerning "controlled waste", which are set out in Part II. Any soil contaminated with Japanese knotweed or giant hogweed or plant material discarded is classified as controlled waste. This means that it is an offence to deposit, treat, keep or dispose of controlled waste without a licence.

- The Waste Management Licensing Regulations 1994[10] 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".

[7] https://secure.fera.defra.gov.uk/nonnativespecies/index.cfm?sectionid=55

[8] http://www.legislation.gov.uk/ukpga/1981/69

[9] http://www.legislation.gov.uk/ukpga/1990/43/contents

[10] http://www.legislation.gov.uk/uksi/1994/1056/contents/made

- Controlled Waste (Registration of Carriers and Seizure of Vehicles) Regulations 1991[11] and the Environmental Protection (Duty of Care) Regulations 1991[12] provide guidance for the handling and transfer of controlled waste.

- The Import of Live Fish Act (1980)[13] and the Prohibition of Keeping Live Fish (crayfish) Order (1996)[14]. The former restricts in England and Wales the import, keeping or release of live fish or shellfish or the live eggs or milt of fish or shellfish of certain species. Under the Crayfish Order it is an offence to keep any crayfish in England and Wales, except under license with the exception of the Signal crayfish in specified areas of the country with established feral populations. A license is required to keep signal crayfish in those parts of England and Wales where extensive feral populations do not currently exist.

- Local authorities also have some relevant powers in Section 215 of the Town and Country Planning Act 1990[15]. This provides the authority with a discretionary power to require landowners to clean up 'land adversely affecting the amenity of the neighbourhood' which may be relevant to control of FINNS such as Japanese knotweed.

- Biodiversity 2020: A Strategy for England's wildlife and ecosystem services[16] This Strategy lists invasive non-native species as one of the direct environmental pressures on biodiversity and has a priority action.

- The NetRegs[17] website contains useful guidance on FINNS and their control

The procedures for the detection, notification and control of fish diseases are already well defined by fisheries legislation. They provide a system of screening fish farms and fisheries for notifiable diseases as well as regulating live fish movements. CEFAS on behalf of the Government organises and coordinates the response to any suspected outbreak.

3.3 Synergy with Existing Plans

This Biosecurity Plan links Government policy, legislation and strategic action with local actions, and reflects the provisions and requirements in the following plans: (Appendix 1).

- North West River Basin Plan
- Solway Tweed River Basin Plan
- Solway Area Management Plan
- Cumbria Biodiversity Action Plan
- Solway Area of Outstanding Natural Beauty Plan
- Morecambe Bay Management Scheme
- Lake District National Park Partnership Plan

[11] http://www.legislation.gov.uk/uksi/1991/1624/contents/made
[12] http://www.legislation.gov.uk/uksi/1991/2839/contents/made
[13] http://www.legislation.gov.uk/ukpga/1980/27
[14] http://www.legislation.gov.uk/uksi/1996/1104/contents/made
[15] http://www.legislation.gov.uk/ukpga/1990/8/contents
[16] http://www.defra.gov.uk/publications/files/pb13583-biodiversity-strategy-2020-110817.pdf

[17] http://www.netregs.gov.uk/

- Lake District National Park Biodiversity Strategy and Action Plan
- Lake District NPA 'Strategy for access to lakes rivers and the coast'

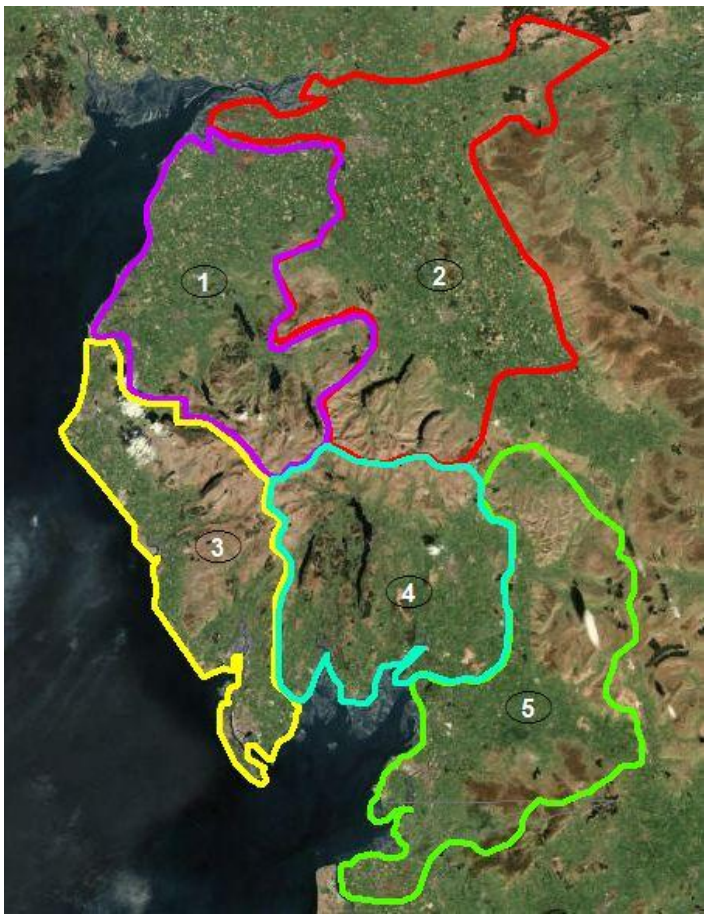
Furthermore, it supports the conservation objectives of designated conservation areas within Cumbria which has:

- 5 RAMSAR sites
- 4 river SSSIs in Cumbria which are also designated as Special Areas of Conservation (SAC) under the EU Habitats Directive.
- 279 SSSI's (624 km of Cumbria's rivers are SSSI's)
- 25 National Nature Reserves
- 37 Wildlife Trust Reserves
- 9 Local Nature Reserves
- 5 RSPB Reserves
- 34 Woodland Trust Reserves
- A multitude of large still waters

4. Freshwater Invasive Non-Native Species Issues in Cumbria

4.1 Description of Cumbria

The Cumbria Freshwater Biosecurity Plan covers the county of Cumbria. For the purposes of the plan the county has been divided into five, using the Environment Agency's Catchment Flood Management Plan divisions. Although part of the Boarder Esk and its tributaries fall within Cumbria, it has been decided not to include them in this plan, but to develop a cross-border Freshwater Biosecurity Plan between Cumbria and the Galloway Fisheries Trust. Similarly, the upper reaches and catchment of the South Tyne and the top of the Tees are excluded from this plan. Although they are part of Cumbria they are included in their parent catchments which are managed by other Rivers Trusts and County authorities.



1. Derwent, West Cumbria and Solway Plain
2. Eden Catchment
3. South West Cumbria
4. Kent, Leven and Crake
5. Lune Catchment

Fig. 1 Map of Cumbria divided into five regions

Cumbria is renowned for its range of dramatic landscapes and wildlife habitats, from the uplands, lakes and rivers of the Lake District National Park, North Pennines and Eden Valley, to the Solway Coast AONB in the north, the wide range of habitats around Morecambe Bay and the Arnside & Silverdale AONB in the south.

By English standards the county is large (6768 km^2), is predominantly rural with a relatively small resident population of 450,000.

The freshwater resources of the county – its many tarns, lakes, rivers and becks – are of great ecological and economic significance. In ecological terms many are designated SSSIs and SACs, supporting iconic protected species such as the otter, native crayfish and the rare freshwater pearl mussel. Many rivers support healthy salmon

populations, which in turn support economically important recreational fisheries. In economic terms many of the major lakes have been modified to function as water supply reservoirs, and the lakes and rivers are a significant part of the county's draw for an estimated 15.3 million visits, many of whom use the water environment for activities such as angling, boating and swimming or just for picnics and paddling on the lake shores.

This combination of a high quality water environment and high usage and visitor pressure makes biosecurity and the management of FINNS issues a particularly high conservation priority for Cumbria, and makes the actions in this plan timely and important.

4.1.1 Derwent, West Cumbria and Solway Plain

Fig. 2 Outline of Derwent, West Cumbria and Solway Plain

This catchment in North and West Cumbria has a large area within the Lake District National Park. The total area of the catchment is 1,235 km^2 and it has four significant river systems which drain the northern fells of the Lake District and the Solway Plain into the Irish Sea. These are the Derwent, Ellen, Wampool and Waver. There are several lakes within the catchment including Derwent Water, Bassenthwaite Lake, Buttermere, Loweswater and Crummock Water; Thirlmere Reservoir and a myriad of small water bodies, particularly upland tarns.

It has one Area of Outstanding Natural Beauty (AONB) and many international, European and national environmental designations. The number of units in the River Derwent and Tributaries SSSI that have invasive species as a factor for unfavourable condition is currently 16 out of 29.

4.1.2 Eden Catchment

Fig. 3 Outline of Eden Catchment

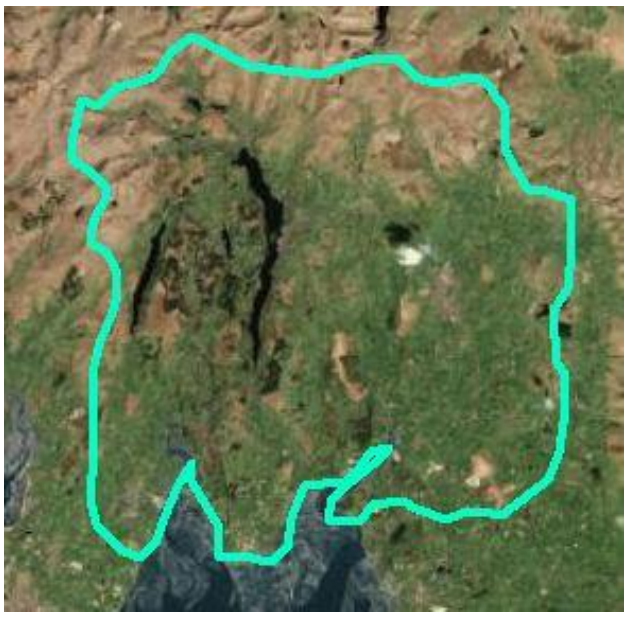
The Eden catchment comprises the River Eden and its tributaries, including the Eamont, Irthing, Petteril and the Caldew, with a total catchment area of 2,400 km^2. Approximately 30% of the catchment lies within Areas of Outstanding Natural Beauty (AONB) with a further 30% designated as landscape of county importance. The catchment includes Ullswater, Haweswater and numerous smaller water bodies has land within both the Lake District National Park and the Yorkshire Dales National Park. The river and many of its tributaries are protected through designation as a SSSI and SAC. 11 out of 42 units in the River Eden and Tributaries SSSI have invasive species as a factor for unfavourable condition.

4.1.3 South West Cumbria

The South West Lakes area covers an area of 900 km^2, containing several small catchments which include the Ehen, Irt, Mite, Esk and Duddon. The two major waterbodies in this area are Ennerdale Water and Wast Water. The rivers within the area drain the steep western fells of the Lake District and flow in a westerly or southwesterly direction before discharging into the Irish Sea. Over half of the area lies within the Lake District National Park and there are several internationally designated environmental sites including the upper River Ehen and the Duddon and Esk estuaries.

Fig. 4 Outline of South West Cumbria

4.1.4 Kent, Leven and Crake



This area includes the Rivers Kent, Leven and Crake which flow from the southern fells of the Lake District. Most of the rivers drain south into Morecambe Bay via the Kent and Leven estuaries, with the exception of some small coastal rivers and becks. Morecambe Bay is a Ramsar wetland site. Two thirds of the area is within the Lake District National Park and there are a number of nationally and internationally protected freshwater sites such as Esthwaite Water, Little Langdale Tarn and Elterwater Sites of Special Scientific Interest (SSSI) and the River Kent Special Area of Conservation (SAC). The area has numerous standing waters and tarns including Grasmere, Rydal Water, Windermere and Coniston Water. There are 12 SSSI units that are in unfavourable condition and are at risk of not meeting their conservation objectives due to FINNS.

Fig. 5 Outline of Kent, Leven and Crake

4.1.5 Lune Catchment

The Lune catchment covers approx 1,300 km^2 and extends from the Howgill Fells in the north to the Forest of Bowland in the south. The western boundary is Morecambe Bay. The catchment consists of steep slopes to the north and west, and is flatter in the east and south. The main tributaries of the Lune include the Rawthey, Greta and Wenning. There are 10 European and over 50 nationally designated environmental sites within the catchment, including 4 SSSIs and 2 AONB sites. Of particular importantance is Morecambe Bay which is an SAC, SPA and Ramsar site.

Fig. 6 Outline of the Lune Catchment

4.2 Biosecurity: Current and potential threats

This section identifies 23 FINNS, diseases and parasites for inclusion in the Cumbria Freshwater Biosecurity Plan and will be the main focus for action. Species included in the amended Wildlife and Countryside Act 1981 have also been considered. The priority species are identified as those that:

- already exist within in Cumbria, or
- have a high risk of introduction due to the nature of the pathways for their introduction and their current geographic proximity, or
- if introduced would have severe consequences for local biodiversity and the economy.

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 which can have severe ecological impacts.

4.2.1 Current Freshwater Invasive Non-Native Species Issues

At least 24 FINNS are currently present in Cumbria. Eight species are established throughout Cumbria and have been identified as priority targets for control because of their widespread economic, ecological and social impact (Table 3). Five species are believed to be present at designated sites (Table 4) and require initial or ongoing survey and risk assessments. At least nine species are widespread but require extensive research and resources to eradicate. However their spread to other sites should be prevented (Table 5).

Table 3: Species established and a priority for control in Cumbria:

	Derwent, West Cumbria and Solway Plain	Eden Catchment	South West Cumbria	Kent, Leven and Crake	Lune Catchment
Japanese knotweed	X	X	X	X	X
Giant hogweed		X	X	X	X
Himalayan balsam	X	X	X	X	X
American mink	X	X	X	X	X
New Zealand Pigmyweed	X		X	X	
Feral geese(Canada, Greylag, Barnacle)	X	X	X	X	X

Table 4: Species present at specific sites that require risk assessments, remediation, containment, eradication:

	Derwent, West Cumbria and Solway Plain	Eden Catchment	South West Cumbria	Kent, Leven and Crake	Lune Catchment
American skunk cabbage	X		X	X	
Chinese mitten crab			X		
American signal crayfish	X			X	
Parrot's feather			X		
Purple pitcherplant	X			X	
Swamp candle			X		

Table 5: Species which are widespread but for which eradication would cause damage to native species and would require extensive resources – if at all feasible, and whose spread to other sites should be prevented:

	Derwent, West Cumbria and Solway Plain	Eden Catchment	South West Cumbria	Kent, Leven and Crake	Lune Catchment
Canadian waterweed	X	X	X	X	X
Nuttall's waterweed	X	X	X	X	X
Fish outside of their natural range (such as Roach, Common bream, Tench, Carp, Goldfish and Ruff)	X	X	X	X	X

The impacts and pathways for spread of these species present in Cumbria are:

Japanese knotweed *(Fallopia japonica)* is found throughout Cumbria. It has now spread along many rivers by movement of plant fragments in 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.

Giant hogweed *(Heracleum mantegazzianum)* is widespread and is present in areas of each catchment. It 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. Giant hogweed out competes native vegetation for space and resources, and can result in a loss of plant and invertebrate diversity. Dense stands can hinder access. Winter dieback exposes soil to erosion with loss of river banks and increased sedimentation.

Himalayan balsam *(Impatiens glandulifera)* is widespread throughout Cumbria. It spreads through natural dispersion by exploding seed pods and 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.

American mink *(Mustela vison)* are present throughout Cumbria. Originally mink escaped from fur farms and have colonised large areas of Great Britain. They are voracious, waterside inhabitants, preying on water fowl and small mammals as well as juvenile salmon and trout. Mink are linked to the decline of water voles in Cumbria. A four year mink control project which ended in 2009 in the Eden catchment found that water voles started to reappear after only 3 years of mink control. There has not been any active coordinated mink control since the end of this project.

New Zealand pigmyweed *(Crassula helmsii)* is present in several locations in Cumbria, in particular Windermere, Grasmere and Rydal water, Bassenthwaite Lake, Derwent Water and Coniston Water. It is spread and can grow from small fragments and is suited to a wide range of slow moving freshwater systems and outcompetes native aquatic plant species. This plant is still available to purchase. It forms dense carpets choking ponds and ditches. Reduced light levels below dense growths can cause loss of native waterweeds and algae as well as reduction of oxygen levels.

Feral geese (Canada/Greylag/Barnacle) are present in large numbers throughout many of the catchments. Windermere and Derwent Water host large non-migratory populations of up to 5,000individuals and damage to the lake shore and eutrophication of the lakes themselves is evident. The native reed, *Phragmites australis* has declined severely in the last 30 years and much of this decline is attributed to the massive increase in grazing of the young reed shoots by geese.

American skunk cabbage (*Lysichiton americanus)* is present at several locations in Cumbria. Although it has been present in small numbers for a number of years, over the past 5 years numbers have rapidly increased. American skunk cabbage is able to build dense stands, particularly in wetlands, river banks and wet woodland where it outcompetes and eventually kills the native ground flora.

Chinese mitten crab (*Eriocheir sinensis*) is known to have been present in the Duddon estuary (South West Lakes), where two females were recorded and captured. However, no subsequent evidence of its presence has been found. The crabs burrow in high density populations which damage river banks and can cause increased sedimentation in the river. It is also the intermediate host for the mammalian lung fluke *Paragonimus ringer,* which is known to infect humans.

American signal crayfish (*Pacifastacus leniusculus*) is known to be present at two locations in Cumbria. A population was found in the Derwent catchment in 2005. This introduced population has been monitored by the EA and regularly trapped and does not seem to have expanded or moved significantly further down into the catchment. The second known location is within the Kent and Leven catchment. Reports in 2010 of their presence were confirmed by the EA in a number of small isolated ponds and tarns within the catchment.

Cumbria is one of the last strongholds of the endangered native white-clawed crayfish (*Austropotamobius pallipes*) in its natural range in the UK. If the signal crayfish were to spread from their current locations, the impact upon the native crayfish would be catastrophic. Signal crayfish are much larger and aggressive than the native crayfish. They prey on the native crayfish; out-compete them for food and seriously damage river habitats and native fish populations. They also carry a virulent fungal disease (*Aphanomyces astaci*) which they tolerate, but is lethal to the native white-clawed crayfish.

Parrot's feather *(Myriophyllum aquaticum)* is known to be present in the South West Lakes in two isolated ponds and tarns. It is an aquatic perennial and grows in emergent and submerged forms. It is most often found in nutrient rich waters and is grown in water gardens around the UK. It is still found in some garden centres and is often sold under one of it pseudonyms. It spreads by vegetative fragmentation. It can increase flood risk by blocking watercourses and drainage channels and can rapidly dominate a water body and displace native species.

Purple pitcherplant (*Sarracenia purpurea*) is known to be present at a number of sites in the county. The Flora of Cumbria refers to 'four well established sites' and it is also being considered a problem on the Solway raised mires. Native to North America, this carnivorous plant traps and digests insects. It is cold hardy and grows in boggy areas, and is able to grow in dense stands where it threatens to out-compete native wetland species.

Swamp candle (*Lysimachia terrestris*) is known to be present in a NNR and a SSSI within the Kent, Leven and Crake catchment. Native to Eastern USA and eastern Canada, this species grows in swamps and along the edges of ponds and lakes. It reproduces prolifically from node-like structures and is able to build dense stands where it outcompetes and eventually kills the native ground flora.

Canadian waterweed *(Elodea canadensis)*
This species is widespread throughout Cumbria. 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 waterweed dominates native macrophyte communities which can lead to their extinction with considerable impacts on local invertebrate communities.

Nuttall's waterweed *(Elodea nuttalli)*
Nuttall's waterweed is recognised from Windermere but is probably more widespread as it is often assumed to be the more common Canadian waterweed. It was introduced to Cumbrian standing waters more recently than Canadian waterweed and appears to still be increasing its biomass in local water bodies. As with Canadian waterweed, it is extremely easy to transport between water bodies as broken fragments on equipment and footwear.

Fish outside their native range (Roach/Bream/Tench/Carp/Goldfish/Ruff)
There are some native fish species that have been transported outside of their natural range. These species may carry novel parasites and diseases that native fish cannot survive. If the species find a foothold (this may be assisted by factors such as changes in water temperature, nutrient loads etc) they may compete with native species for habitat and food, significantly altering food webs and cause severe and unknown ecological impacts.

4.2.2 Potential Freshwater Invasive Non-Native Species Biosecurity Issues

The FINNS listed below are currently not known to be present in Cumbria. They have been classified since 2007 by the Cumbria Forum as High Level Threats due to their likely impact on biodiversity and the local economy in combination with the likelihood of their introduction. The level of risk of introduction is based on the pathways for the introduction of FINNS, their current geographic proximity and their potential uses (e.g. food in restaurant trade) within Cumbria.

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

Table 6: High threat level species, pathways, risk of introduction and potential impact in Cumbria

SPECIES	PATHWAY AND RISK OF INTRODUCTION	LOCAL IMPACTS
Crayfish plague *(Aphanomyces astaci)*	**High Risk** From intentional/unintentional introduction of infected signal crayfish From unintentional introduction of plague spores through: • Fish stocking • Clothing, footwear or equipment which has been in contact with infected water • Machinery used across catchments for in-river engineering work • Ballast water	▪ Catastrophic impact on white clawed crayfish (*Austropotamobius pallipes*) populations throughout Cumbria.
Floating pennywort *(Hydrocotyle ranunculoides)*	**High Risk** From unintentional introduction from anglers and water sport enthusiasts through: • Plant fragments on clothing and or equipment which has been in contact with infected waters. • Plant fragments on machinery used across catchments for in-river engineering work (including mobile silt traps) • Introduction from ornamental ponds	• Can grown up to 20cm a day and can quickly dominate a waterbody forming thick mats which can impede water flow and amenity use • Outcompete native species by blocking out sunlight and causing deoxygenation.

SPECIES	PATHWAY AND RISK OF INTRODUCTION	LOCAL IMPACTS
Asian Topmouth Gudgeon *(Pseudorasbora parva*)	**High Risk** Through live bait, ballast water, fish stock movements and accidental releases from aquaria. An occurrence in 2005 was eradicated from Ratherheath Tarn near Kendal.	• Effective competitor to native still water species of fish • Preys on fish eggs and larvae
Killer shrimp (*Dikerogammarus villosus*)	**High Risk** By unintential introductions from boat hulls, introduction by anglers and water sports enthusiasts. At present found in Grafham Water, Cambridgeshire and two sites in Wales.	• Displacement and or local extinction of native gammarid species • Has been observed attacking small fish which raises concerns over whether vulnerable life stages (eggs, larvae and juveniles) of fish may also be at risk • May be an intermediate host for acanthocephalan worms (parasites of birds and fish)
Water Primrose *(Ludwigia peploides)*	**High Risk** By unintentional introduction from anglers and water sport enthusiasts through: • Plant fragments on clothing and or equipment which has been in contact with infected waters . • Introduction from ornamental ponds	• Out-competes native species by forming a dense cover on the water surface, blocking out light and causing deoxygenation. • Dense and continuous stands can be a health hazard as the water surface appears to be solid. • Increases risks of flooding by blocking watercourse and drainage channels.
Zebra mussel (*Dreissena polymorpha)*	**Medium Risk** From unintentional introduction by contaminated boat or canoe hulls, 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 for fish.
Bloody red shrimp *(Hemimysis anomala)*	**Medium Risk** By unintential introductions from boat hulls, introduction by anglers and water sports enthusiasts.	• Relative of the opossum shrimp (*Mysis relicta)* which is threatened in Ennerdale Water. • Bloody red shrimp may dispurse naturally along rivers once in a catchment • Bloody red shrimp is a probable direct competitor of *Mysis relicta*. • Disrupt sensitive food webs • Alter nutrient cycles

SPECIES	PATHWAY AND RISK OF INTRODUCTION	LOCAL IMPACTS
Asian Clam (*Corbicula fluminea)*	**Medium Risk** From unintentional introduction by contaminated boat or canoe hulls, imported aquaculture, engines and bilge water.	• Considerable filtration capacity, hundreds of thousands of individuals per square meter in density. • Huge consumers of phytoplankton which increases the clarity of water which enhances macrophyte growth • Compete with native species
Freshwater external parasite of salmon (*Gyrodactylus salaris*)	**Medium Risk** By unintentional introduction from anglers and water sport enthusiasts through: • Stocking of contaminated fish • Clothing/equipment which has been in contact with infected water • Ballast water	• Projected catastrophic impact on salmon *(Salmo salar)* populations throughout Cumbria.
Any other non-native novel fish species whose risk is unknown	**Medium Risk** By live bait, ballast water, fish stock movements and accidental releases from aquaria.	• Out-compete native species • May prey on native fish eggs and larvae • May carry important fish diseases not yet present in the UK
Curly water weed *(Lagarosiphon major)*	**Medium Risk** By unintentional introduction from anglers and water sport enthusiasts through: • Machinery used across catchments for in-river engineering work (including mobile silt traps) • Plant fragments on clothing, equipment (including canoes) which have been in contact with infected waters. • Accidental introduction from ornamental ponds	• Out-competes native species by forming a dense cover on the water surface, blocking out light and causing deoxygenation. • Dense and continuous stands can be a health hazard as the water surface appears to be solid. • Increases risks of flooding by blocking watercourse and drainage channels.
Water fern *(Azolla filiculoides)*	**Medium Risk** Through unintentional introduction from anglers and water sport enthusiasts through: • Plant fragments on clothing and or equipment which has been in contact with infected waters. • Accidental introduction from ornamental ponds	• Out-competes native species by forming a dense covering on the surface of the water, blocking out light and causing deoxygenation. • Dense and continuous stands can be a health hazard as the water surface appears to be solid. • Increases risks of flooding by blocking watercourse and drainage channels.

SPECIES	PATHWAY AND RISK OF INTRODUCTION	LOCAL IMPACTS
Fanwort *(Camomba caroliniana)*	**Low Risk** By unintentional introduction from anglers and water sport enthusiasts through: • Plant fragments on clothing, equipment (including canoes) which have been in contact with infected waters. • Accidental introduction from ornamental ponds	• Out-competes native species by forming a dense covering on the surface of the water, blocking out light and causing deoxygenation. • Dense and continuous stands can be a health hazard as the water surface appears to be solid. • Increases risks of flooding by blocking watercourse and drainage channels.

There are several FINNS that are not yet known to be present in Britain as well as species where little is known about at all, which could pose a High Threat to Cumbria's freshwaters if introduced. Pathways and means of introduction of these unidentified invaders into Cumbria are included in Table 7 as well as species from Table 6.

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

Table 7: Pathways and Partners in Cumbria

Pathway	Partners
Intentional introduction or planting	Local Councils and Planning departments
Fouling and ballast water of freshwater vessels	Recreational water users and boat operators, local canoe and water sports organisations
Sale from garden or pond centres	Horticultural Trade Association/Ornamental Fish Producers
Contaminated watersports equipment e.g. from anglers, canoeists, and contaminated water as a medium for live fish transport	Recreational water users, fishery owners and angling clubs
Escape and spread from fish farms, ponds and gardens	Aquaculture, angling industry, riparian and lakeshore owners, members of the public, angling clubs
Movement of contaminated soils or vehicles	Local Councils, EA, farmers, building contractors
Movement of hired machinery used across catchments for in-river engineering work	Engineering hire companies, Local Councils, farmers, EA, engineering contractors
Improper control and disposal measures e.g. cutting and dumping without treatment	Local councils, EA, riparian owners, landscaping contractors, members of the public
Fish stocking	EA, CEFAS, Angling clubs, Fish Farm suppliers

4.2.3 Fish Health

There are a several diseases and parasites that have the potential to create catastrophic or significant impacts on wild, internationally significant populations of salmon and trout in the county.

Parasites & diseases

Restrictions on the import into the UK of live fish have played a major part in preventing the introduction and spread of serious fish diseases. Health conditions of aquaculture animals are today governed by the Fish Health Regulations 1997[18] that have three categories of Notifiable Diseases in Fish depending on their potential impact on the aquaculture industry and wild fish stocks. (See Appendix 2)

The biggest current threat to Atlantic salmon populations and the fisheries they support in the UK is the parasite ***Gyrodactylus salaris*** **(Gs).** Native to the Baltic, it may be introduced through contaminated fish stocks for aquaculture. The potentially catastrophic consequences of its introduction mean that it is a priority for angling, fisheries and aquaculture industries to identify and produce programmes for its control and control of potential vectors.

The introduction of the crayfish plague (***Aphanomyces astaci***) into any catchment in Cumbria would be disastrous to the native white clawed crayfish populations. Risks of introduction are high and therefore it is also a priority to identify and mitigate all potential vectors.

4.3 Partners

The formation of partnerships is imperative if this plan is to succeed. Regulatory agencies and bodies associated with other relevant management plans include:

Table 8: Partners in Cumbria

Commercial	Government	Non-Government Organisation (National)
United Utilities Windermere Lake Cruises Ullswater Steamers Boat hire companies Marinas Hydro power developers	Department of Environment Food and Rural Affairs Natural England Environment Agency Lake District National Park Authority Cumbria Highways Forestry Commission Cumbria County Council Allerdale Borough Council Barrow Borough Council Carlisle City Council Eden District Council South Lakeland District Council	The Rivers Trust Rivers and Fisheries Trusts of Scotland National Trust The County Wildlife Trusts Farming and Wildlife Advisory Group British Trust for Conservation Volunteers Salmon and Trout Association Angling Trust Royal Society for the Protection of Birds

[18] http://www.legislation.gov.uk/uksi/1997/1881/contents/made

Non-Government Organisation (Local)	Conservation and Biodiversity	Recreation
University of Cumbria Freshwater Biological Association Cumbria Biodiversity Data Centre Friends of the Lake District	South Cumbria Rivers Trust Cumbria Freshwater Invasive Non-Native Species Initiative Eden Rivers Trust Eden Invasive Species Initiative Lune Rivers Trust West Cumbria Rivers Trust Cumbria Wildlife Trust Cumbria Biodiversity Partnership Derwent Owners Association Derwent Catchment Invasive Species Group Windermere Invasive Species Group Duddon Invasive Species Group Kent Invasive Plant Group Lake District Users Forum Furness and South Cumbria Fisheries Consultative Association Cumbria Woodlands	British Canoe Union Local Canoe Clubs (Carlisle, Copeland, Duddon, Lakeland, Sedbergh and District, West Cumbria and Windermere Canoe Clubs) Ramblers Association Angling clubs Royal Yachting Association

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

This plan identifies the actions required to change the standard practices of the above groups in order to reduce the opportunities for the introduction and spread of FINNS, diseases and parasites.

4.4 Existing FINNS control activities

There are several organisations and Local Action Groups (LAGs) that are undertaking activities associated with the prevention, control and eradication of FINNS (Table 9).

This plan will include and support existing FINNS control programme in Cumbria.

Table 9: Existing FINNS control activities in Cumbria

Organisation/Project	Location of Activity	Description of Activity(ies)
CFINNS	Cumbria	Developing & Coordinating a strategic countywide approach to addressing FINNS issues
Kent Invasive Plant Group Led by volunteers, supported by NE, EA, SCRT	**KENT, LEVEN AND CRAKE** Kent/Gowan/Mint/Sprint	Control and surveying of Himalayan balsam, Japanese knotweed and giant hogweed; awareness raising since 2003
Windermere Invasive Species Group Led by volunteers, supported by NE, EA, NT, LDNP, SCRT and local land owners	**KENT, LEVEN AND CRAKE** Rothay, Brathay, Trout Beck, Cunsey, North and South Basins of Windermere, Grasmere and Rydal Water	Control and surveying of Himalayan balsam, Japanese knotweed, giant hogweed and American skunk cabbage; awareness raising
Derwent Catchment Invasive Species Group (EA, NE, NT, LDNP, DRT, DOA, Local land owners)	**DERWENT, WEST CUMBRIA AND SOLWAY PLAINS** Greta, Derwent, Thirlmere, Derwent Water, Bassenthwaite Lake, Cocker, Lowes Water, Crummock Water, Buttermere, Marron, Overwater	Control and surveying of Himalayan balsam, Japanese knotweed and American skunk cabbage; Survey of signal crayfish, awareness raising
Eden Invasive Species Group (ERT, Carlisle city council, NT, LDNP, Parish Councils, Countryside Landowners Association, local land owners, NE, EA)	**EDEN CATCHMENT** Eden, Old Petterill, Petterill, Irthing, Leith, Eamont	Control and surveying of Himalayan balsam, giant hogweed and Japanese knotweed; awareness raising; surveying and monitoring of native white-clawed crayfish
SCRT	**SOUTH WEST CUMBRIA & KENT, LEVEN AND CRAKE** Duddon, Crake, Leven, Kent, Bela, Coniston Water, Grasmere, Rydal Water	Control and surveying of Himalayan balsam, Japanese knotweed, giant hogweed and American skunk cabbage; awareness raising
LRT	**LUNE CATCHMENT** Control throughout catchment, Surveying in Dent and Sedburgh	Surveying of Himalayan balsam and control of Japanese knotweed; awareness raising

There are a number of areas and catchments that have no existing control activities.

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 pathways for the introduction and spread of FINNS and fish diseases and include a mixture of awareness raising and practical measures. Awareness activities take note of the 'Invasive Non-Native Species Strategic Communications Plan for Great Britain'[19].

Increased probability of **early detection** of the introduction or spread of FINNS is realised through surveys to establish the location of existing populations and establishment of a coordinated local **surveillance** and reporting system.

This will be supported by routine **monitoring** of new and established populations or sites vulnerable to the introduction and spread of these species. Liaison with neighbouring counties regarding FINNS distribution will also be crucial in the success of this part of the plan.

Rapid response mechanisms will be designed as part of this plan and implemented when and where possible and **mitigation and control** measures will follow.

Objective 1: Reduce the risk of the introduction and spread of aquatic and riparian FINNS and selected fish / crayfish diseases within each catchment of the county of Cumbria.

- ***Output 1.1 – All partners and specific high risk groups are aware of the ecological and economic impacts of FINNS, 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 messages to the general public.

The local priorities for awareness will focus on disrupting the pathways for the introduction and spread of FINNS in Cumbria. The partners, the identified areas of priority and the proposed mechanisms for delivery are presented in Table 10 below. The roles and actions of government agencies and non government bodies in promoting awareness of FINNS issues are presented in Table 11.

[19] https://secure.fera.defra.gov.uk/nonnativespecies/index.cfm?sectionid=14

Table 10: Priority areas for awareness and delivery mechanisms according to stakeholder group

Partners / Stakeholder Groups	Priority Area	Mechanism of Delivery
Water User associations (canoeists, diving, sailing clubs)	• Promote awareness to clubs and participants of the dangers arising from FINNS • Promote practical action to manage risks	• CFINNS Initiative to work with associations to help install and promote disinfection of equipment and provide appropriate facilities to eliminate the risk of accidental transfer of FINNS • Promotion of 'Check Clean Dry' campaign • CFINNS Initiative website • Work to amend canoe agreements and promote catchment use from low to high risk rather than the other way round
Local Garden Centres	• Promote and follow the Horticulture Code of Practice (2011) • Promote 'BE PLANT WISE' campaign, covering security and disposal of FINNS to all garden centres • Target gardeners to use native pond species and to dispose of plant material and/or soils in a responsible manner.	• CFINNS Initiative to work with garden centres to encourage distribution of codes of practice and posters for 'BE PLANT WISE' campaign.
Fish farms supplying Cumbria	• Use of sufficient screens and other biosecurity measures • Risks and dangers of importing stock from contaminated areas • Controls on movement of stock and water	• CFINNS Initiative to work with local industry and trade associations to advise members regularly of best practice in respect of FINNS and raising awareness of 'Check Clean Dry' campaign • Regulatory agencies (EA) to undertake site visits to discuss and advise on issues involving FINNS • Regulatory agencies to undertake frequent fish farm stock checking prior to movement. • Raise awareness of the risks associated with illegal unauthorised stocking • CFINNS Initiative website
Local Aquarium and pond stockists	• Promote code of practice to all pet shops and suppliers of ornamental fish and plants • Promote 'BE PLANT WISE' campaign and ILFA information	• CFINNS Initiative to work with retailers to encourage distribution of ILFA codes of practice and posters for 'BE PLANT WISE' campaign

Partners / Stakeholder Groups	Priority Area	Mechanism of Delivery
Landowners	• Promote knowledge of biosecurity issues amongst all tenants and resource users • Identification of suitable persons to act as "eyes".	• Work with CFINNS Initiative to ensure dissemination of best practices and appropriate signage to reduce threats from FINNS • Promote 'BE PLANT WISE' and 'Check Clean Dry' campaigns • CFINNS to offer training for "eyes" • CFINNS Initiative website
Angling clubs	• Promote knowledge of biosecurity issues including 'Check Clean Dry' campaign 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 "eyes" • Raise awareness of the risks associated with illegal unauthorised stocking	• Work with CFINNS Initiative to ensure dissemination of best practices and appropriate signage to reduce threats from FINNS • Promote 'Check Clean Dry' campaign • CFINNS to offer training for "eyes" • CFINNS Initiative website • Promote strategies to improve natural fisheries
Council Services/ Contractors / Ground maintenance workers and Engineering hire companies	• Promote appropriate working practices and waste disposal to avoid the spread of FINNS • General awareness of impacts and measures to prevent/control FINNS • Reduce spread of FINNS through contaminated machines for hire	• Formulate and promote codes of practice • Work with CFINNS Initiative to ensure dissemination of best practices • CFINNS to offer training for ''eyes'' • CFINNS Initiative website • Empty and disinfect all hire machinery used in freshwaters before transport.
General Public	• General awareness of impacts and measures to prevent/control FINNS through 'Check Clean Dry' campaign • Promote the Biosecurity Plan to all retail outlets who deal with FINNS e.g. pet shops, garden shops • Publicise existing legislation and penalties	• Local media campaigns of 'Check Clean Dry' and 'BE PLANT WISE' • Use of CFINNS Initiative and NNSS websites • CFINNS Initiative to develop leaflet and promote the Biosecurity Plan, the dangers arising from FINNS and the reporting system • CFINNS Initiative website
Schools	• Promote awareness to students highlighting the dangers of FINNS • Awareness, understanding and implementation of 'Check Clean Dry' and 'BE PLANT WISE' campaigns	• School visits • Field trips • Promotion of 'Check Clean Dry' and 'BE PLANT WISE' campaigns • CFINNS Initiative website

Partners / Stakeholder Groups	Priority Area	Mechanism of Delivery
Port Authorities	• Avoid pumping out of non sterilised ballast water in harbour • Role of hull-fouling in the introduction and spread of FINNS	• Promote implementation of code of practice requiring non-sterilised ballast water to be discharged away from harbour. • Promotion of 'Check Clean Dry' campaign • CFINNS to assist with the supply of posters and other awareness material for display and signage. • CFINNS Initiative website

Table 11: Roles and/or actions of government and non-government agencies in promoting awareness of FINNS issues:

Organisation	Role and/or action	Delivery Mechanisms
CFINNS Initiative	• Promote and coordinate awareness to general water users promoting the Biosecurity Plan and highlighting the dangers from FINNS • Liaison between national and local Initiatives • Develop expertise and knowledge of FINNS identification and management	• Integrate 'Check Clean Dry' procedures into all working practices • Promote and launch of Biosecurity Plan • Develop materials to promote the Biosecurity plan, the dangers arising from FINNS and the reporting system and ensure appropriate distribution to partners • Promote both 'Check Clean Dry' and 'BE PLANT WISE' campaigns
Angling Trust and local clubs	• Promote awareness to anglers and angling clubs of the dangers arising from FINNS. • Raise awareness of the risks associated with illegal unauthorised stocking	• Integrate 'Check Clean Dry' procedures into all working practices • Promote disinfection of equipment and provide appropriate facilities • Promote 'Check Clean Dry' campaign • Holding of open days, field visits and demonstrations • Promote regular stock checking at fish farms prior to movement
Cumbria County Council	• 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 'Check Clean Dry' campaign to the general public	• Integrate 'Check Clean Dry' procedures into all working practices • Council 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 FINNS • Holding of awareness event/open days to promote biosecurity issues • Distribute leaflets with council tax bills • Display posters produced by CFINNS and for 'Check Clean Dry' campaign in council offices, libraries and other public places

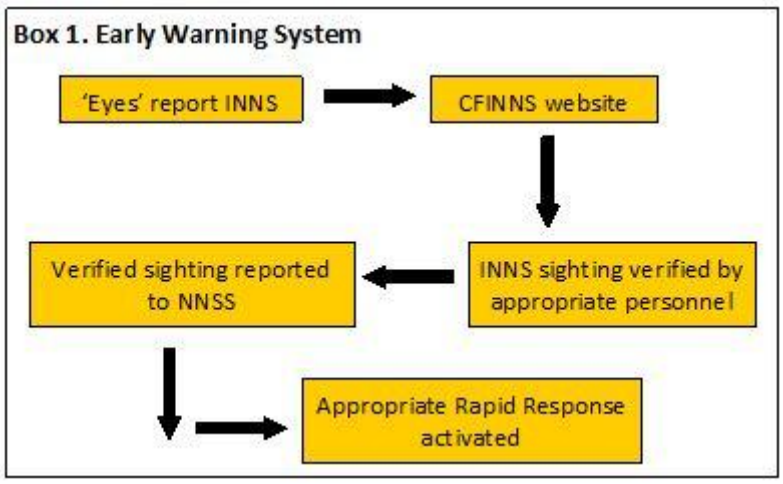
Organisation	Role and/or action	Delivery Mechanisms
Environment Agency	• Clarify EA responsibilities for FINNS to both staff and customers • Incorporate FINNS issues into relevant guidance documents (as they are developed or updated)	• Integrate 'Check Clean Dry' procedures into all working practices
Lake District National Park	• Promote awareness of FINNS issues within the national park and park staff with reference to threats posed by further introductions of FINNS • Raise awareness of FINNS with park users i.e. campers, anglers, walkers, canoeists etc.	• Integrate 'Check Clean Dry' procedures into all working practices • Posters displayed at campsites, walking trails, angling sites and canoe launching spots • Holding of awareness event/open days to promote biosecurity issues
Cumbria Highways	• Promote awareness and appropriate working practices and waste disposal to avoid the spread of FINNS • General awareness of impacts and measures to prevent / control FINNS • Reduce spread of FINNS through contaminated machinery movements	• Integrate 'Check Clean Dry' procedures into all working practices • Display posters for 'Check Clean Dry' campaign at strategic locations
Natural England	• Promote awareness of FINNS issues posed by further introductions of FINNS to landowners • Incorporate FINNS issues into relevant guidance documents (as they are developed or updated)	• Integrate 'Check Clean Dry' procedures into all working practices • Work with CFINNS Initiative to ensure dissemination of best working practices
United Utilities	• Promote awareness and appropriate working practices and waste disposal to avoid the spread of FINNS to staff • General awareness of impacts and measures to prevent / control FINNS • Reduce spread of FINNS through contaminated machinery movements • Incorporate FINNS issues into relevant guidance documents (as they are developed or updated)	• Integrate 'Check Clean Dry' procedures into all working practices • Display posters for 'Check Clean Dry' campaign at strategic locations

Organisation	Role and/or action	Delivery Mechanisms
Rivers Trusts (West Cumbria, Eden and South Cumbria); National Trust; Friends of the Lakes; Freshwater Biological Association; Cumbria Wildlife Trust; Cumbria Biodiversity Partnership; University of Cumbria; Forestry Commission; Royal Society for the Protection of Birds	• Promote awareness of FINNS issues and threats to staff and volunteers • Raise awareness of FINNS to general public, landowners and local organisations • Reduce spread of FINNS through contaminated equipment	• Integrate 'Check Clean Dry' procedures into all working practices • Posters displayed around properties and appropriate points such as campsites, walking trails, angling sites and canoe launching spots • Holding of awareness event/open days to promote biosecurity issues • Work with CFINNS Initiative to ensure dissemination of best working practices
FWAG	• Promote awareness of FINNS issues posed by further introductions of FINNS to landowners • Incorporate FINNS issues into relevant guidance documents (as they are developed or updated)	• Integrate 'Check Clean Dry' procedures into all working practices • Work with CFINNS Initiative to ensure dissemination of best working practices

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

Objective 2: Develop and establish detection and surveillance of, and rapid response mechanisms to new incidences of specified FINNS.

Output 2.1 - Early warning and reporting system established for new FINNS in Cumbria



The "eyes" of the early warning system (Box 1) will be trained members of the public, bailiffs, canoeists and walkers with reported sightings verified by trained personnel. A record of a GB or local high priority species (Table 12) will be verified. 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 soon as possible. All verified sightings will also be entered onto the CFINNS Geographic Information System to monitor FINNS distributions within Cumbria. Actions to establish the early warning system are described in Section 5.2.

Output 2.2 – Develop strategic monitoring of FINNS

The CFINNS Initiative will work with all partners to develop and agree protocols for FINNS surveying and monitoring as well as ensuring that the data is stored in a format which can be shared using GIS and or Google Earth. In the long term, data collected will connect to the GB Non-native Species Information Portal[20] and the National Biodiversity Network[21] in order to build a clearer picture at a national level. A standardised recording sheet and data storage protocol will ensure compatibility with existing habitat data. Manuals on methodologies will be produced and staff trained to ensure that high quality data is collected, stored and shared.

Output 2.3 – Rapid response mechanism established for new FINNS that pose significant threats to the local biodiversity and economy.

The type of response will depend on the severity of the species detected (Table 12) and will be proportionate to the threat posed. There are three levels of response:

- A GB level response that will be undertaken by national governmental organisations as part of the GB INNS strategy
- A high priority local rapid response
- A local response based on risk assessment

[20] https://secure.fera.defra.gov.uk/nonnativespecies/factsheet/index.cfm

[21] http://www.nbn.org.uk/

Table 12: Response level for FINNS in Cumbria

GB Response	High Priority Local Response	Local Response
Gyrodactylus salaris Asian topmouth gudgeon Ruddy duck Water primrose Killer shrimp Any other non-native novel fish species	American signal crayfish Crayfish plague Floating pennywort Chinese mitten crab Zebra mussel Parrot's feather Water fern Curly waterweed Fanwort Purple pitcherplant Swamp candle Bloody red shrimp Asian clam	American mink Japanese knotweed Himalayan balsam Giant hogweed American skunk cabbage New Zealand pigmyweed Feral geese

Only two of the GB priority species have contingency plans written for them that will be triggered when reported. These are *Gyrodactylus salaris* which has the 'Contingency Plan for Combating *Gyrodactylus salaris* in England'[22], and Water primrose which has an 'Invasive Species Action Plant' (ISAPs)[23].
However, as yet there are no contingency plans or ISAPS for any of the other GB priority species. The Non-Native Species Secretariat is in the process of writing ISAPs which will be used to help coordinate response to the key species.

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 Table12. The actions required to establish and maintain the Rapid Response Mechanism (RRM) are presented in Section 5.2

Table 13: 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 GB institutions • Determine the extent of infestation • Isolation of area where practicable • Establish source and check related sites • Closure of all pathways • Biosecurity measures implemented • Decision on appropriate action eradication/containment. • Approved eradication methodology	• Report to local and GB institutions • Determine the extent of infestation • Isolation of area where practicable • Establish source and check related sites • Closure of all pathways • Biosecurity measures implemented • Decision on appropriate action eradication/containment. • Approved eradication	• Report to local recording centres • Surveys in course of normal work to establish and map distribution • Establish source • Risk assessments • Inclusion of new areas in existing control / eradication programmes • Engagement and support of local interests • Monitor as part of planned catchment

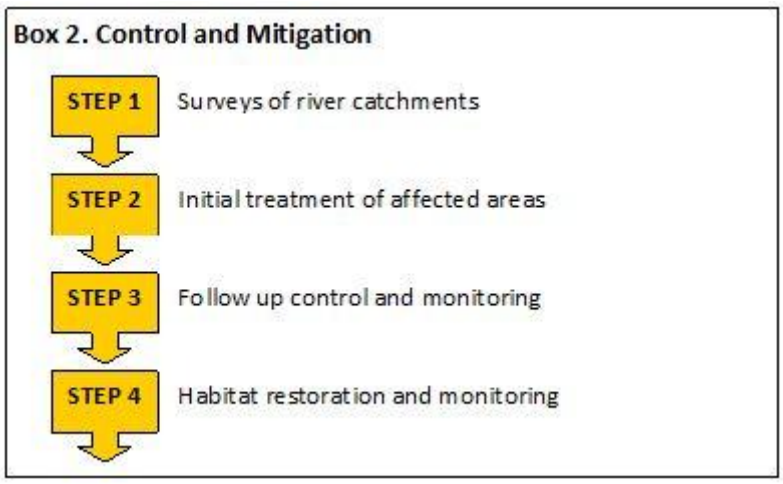
[22] http://www.oie.int/fileadmin/Home/eng/Animal_Health_in_the_World/docs/pdf/gs-contingency-plan.pdf

[23] https://secure.fera.defra.gov.uk/nonnativespecies/index.cfm?sectionid=92

• Engagement and support of local interests for surveillance, monitoring and biosecurity measures • Monitor	methodology • Engagement and support of local interests • Monitor as part of planned catchment monitoring programme	monitoring programme

Objective 3: Prioritisation, control or eradication of existing populations of specified FINNS.

Output 3.1 – Coordinated control or eradication and habitat restoration programmes established and operational.



Following risk assessments and prioritisation, eradication and control activities will follow recognised good practice e.g. target nascent and "upstream or source" populations of FINNS that are potential sources of spread and re-infestation. A combination of specialist contractors, partners, staff and volunteers and will be used depending on the management requirements of the species and area. Envisaged mitigation, eradication and control measures for the FINNS reported as being present in Cumbria are presented in Table 14.

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

Table 14: Invasive Non Native Species Control and Eradication in Cumbria

SPECIES	ACTION	TREATMENT/POST TREATMENT ACTIONS
Japanese knotweed Giant knotweed Himalayan knotweed	Control/Eradication Identify and close pathways.	• Leaf spraying with Glyphosate herbicide for existing populations once a year in mid-late summer with continual follow treatment for up to 3 years if required. (Licence and permits required.) • Stem injection for smaller populations and individual plants. (Licence and permits required.) • Monitoring effect of bio control agent psyllid once present in Cumbria • Requirements for riparian zone habitat restoration assessed and implemented

SPECIES	ACTION	TREATMENT/POST TREATMENT ACTIONS
Giant hogweed	Control/Eradication Identify pathways and close	• Leaf and stem spray with Glyphosate herbicide x2 a year with continual treatment for up to 2 years. (Licence and permits required.) • Monitor catchment for activation of dormant sources of infestation • Habitat restoration if required
Himalayan balsam	Control/Eradication Identify pathways and close	• Hand pull, strim or Glyphosate herbicide treatment for existing populations throughout the growing season. (Licence and permits required.) • Monitor catchment for activation of dormant sources of infestation • Habitat restoration if required
American mink	Control/Eradication	• Co-ordinated monitoring and trapping
New Zealand pigmyweed	Control/Eradication Identify pathways and close	• No effective control mechanism for well established populations. • Chemical control with Glyphosate for isolated plants. (Licence and permits required.) • Smothering with polythene or jute matting for isolated plants or new infestations. (Permits required).
Feral geese	Control	• Egg oiling. (Licence and permits required.) • Culling of flightless adults. (Licence and permits required.)
American signal crayfish	Mitigation for white-clawed crayfish Control/Eradication Identify pathways and close	No effective control mechanism once signal crayfish are released into a river. • Potential for control with chemical treatment for small still waters. (Licence and permits required.) • Control will not be an option if become established in a major river.

SPECIES	ACTION	TREATMENT/POST TREATMENT ACTIONS
American skunk cabbage	Control/Eradication Identify pathways and close	• Leaf spraying with 2-4-D herbicide treatment for existing populations. (Licence and permits required.) • Digging up existing plants in smaller populations • Monitor catchment for activation of live and dormant sources of infestation
Parrot's feather	Control/Eradication Identify pathways and close	• Mechanical control followed by chemical control with either Glyphosate or 2,4-D amine. (Licence and permits required.)
Purple pitcherplant	Control/Eradication Identify pathways and close	• Hand pull or hand dig • Monitor area for dormant sources of infestation
Swamp candle	Control/Eradication Identify pathways and close	• Hand pull or hand dig • Monitor area for dormant sources of infestation

Objective 4: Establish a sustainable management framework that coordinates actions of local and catchment based partners.

Output 4.1 – Local organisations and partners implementing coordinated management actions.

Effective action to address FINNS issues has to be strategic, coordinated and systematic. This Biosecurity Plan is the first step to achieving this and relies on cooperation between all partners to implement the agreed actions.

Recognition of the need for such an approach was central to the launch of the CFINNS Initiative in 2010 and subsequent development of this plan.

For effective implementation of the Cumbria Freshwater Biosecurity Plan, there is a need to continue the work initiated by CFINNS for at least the intended lifetime of the plan. Furthermore it is important that the work is provided with a firm institutional base. With the agreement of the principle funders and host organisation the Initiative will therefore become embedded within the SCRT for at least the duration of this Plan, funding permitting.

The Coordinator post will continue to be used as a central point of contact for invasive species issues in the county, assisting and encouraging partners in the implementation of key actions in the Plan. The coordinator will establish good communication between national, county and local partners as well as with and between Local Action Groups (LAGs). Education, raising awareness, horizon scanning and fund raising will be some of the key functions of the post.

The position of the Coordinator has been and will continue to be an efficient and effective mechanism by which to deliver national invasive species strategies and campaigns at a county, catchment and local level.

The Coordinator will provide support and seek sustainable funding for existing LAGs and the three proposed seasonal catchment INNS Officers, whilst also seeking to develop new groups where none currently exist.

5.2 Actions and Timeframes

The table below presents the County-wide actions required to realise the objectives and outputs described in Section 5.1 and timeframe required for their implementation.

Table 14: Timeframes and actions (Same as Table 1).

: Solid line indicates short–term action Dotted line indicates long-term ongoing effort

ACTION	TIMEFRAME								
	2011	2012	2012	2013	2013	2014	2014	2015	2015
Objective 1: Reduce the risk of the introduction and spread of FINNS and fish / crayfish diseases within each catchment of Cumbria									
Output 1.1 – All partners and specific high risk groups aware of the ecological and economic impacts of FINNS, means of introduction, preventative measures and spread as well as management best practices.									
Launch and promotion of Biosecurity plan through national and local press and through website links	—	—							
Launch and raise awareness of campaign – 'check clean dry' - through national and local press and through website links	.....	.....	.....	.....	.....	.....	.....	.....	.....
Produce and disseminate 'check clean dry' campaign leaflets, posters, press releases, website information, wallet cards and presentations on biosecurity risks and the reporting system	.....	.....	.....	.....	.....	.....	.....	.....	.....
Promotion of 'check clean dry' campaign to canoeists, boaters and anglers at water entry points and parking points, fishing huts and parking points, relevant retail outlets, open days and agricultural shows	.....	.....	.....	.....	.....	.....	.....	.....	.....
Engage with and promote awareness of FINNS (Be plant wise campaign) with garden centres and aquatic suppliers in the county	.....	.....	.....	.....	.....	.....	.....	.....	.....
Work with environmental groups, schools, organisations and partners in order to enhance awareness of FINNS		.....	.....	.....	.....	.....	.....	.....	.....
Install and promote the use of disinfection/wash down stations at Marinas throughout the county	.....	.....	.....	.....	.....	.....	.....	.....	.....
Liaise with and work alongside neighbouring counties to monitor distribution of FINNS	.....	.....	.....	.....	.....	.....	.....	.....	.....
Produce leaflet on management best practices and legislation including waste management & planning regulations		—	—						

ACTION	TIMEFRAME								
	2011	2012	2012	2013	2013	2014	2014	2015	2015
Develop relationships with high risk groups (anglers, canoeists etc) to raise awareness and meet the objectives									
Liaise with DEFRA nationally									
Objective 2: Develop and establish detection and surveillance of, and rapid response mechanism to new incidences of specified FINNS.									
Output 2.1 - Early warning and reporting system established for new FINNS in Cumbria.									
Identify and locate appropriate experts in specific FINNS									
Train personnel in the identification of FINNS from each catchment									
Train the personnel to act as trainers themselves									
Work with user and interest groups to identify "reporting network"									
Train members of "reporting network"									
Produce database to manage FINNS records from surveys									
Establish, test and refine communication mechanisms within 'early warning' system									
Monitor and periodically evaluate efficacy of system									
Liaise with rapid response teams in national organisations such as EA									
Output 2.2 – Develop strategic monitoring of FINNS.									
Determine the objectives, priorities and frequency of monitoring									
Develop and agree protocols									
Produce database to manage FINNS survey data									
Train personnel in monitoring methods from each catchment									
Develop monitoring manual									
Output 2.3 – Rapid response mechanism established for new FINNS that pose significant threats to local biodiversity and economy.									
Identification of high priority FINNS county wide									
Agree rapid response mechanisms and contingency plans for high priority FINNS									
Agree organisations responsible for high priority FINNS									
Establish quality control of process i.e. that personnel are being trained to execute contingency plans									
Establish quality control of process in which funding resources are identified									

ACTION	TIMEFRAME								
	2011	2012	2012	2013	2013	2014	2014	2015	2015
Establish quality control of process in which refresher training is organised		.....	.....	.....	.....	.....	.....	.....	.....
Establish quality control of process in which populations and treated areas are monitored		.....	.....	.....	.....	.....	.....	.....	.....
Objective 3: Prioritisation, control or eradication of existing populations of specified FINNS									
Output 3.1 – Coordinated control or eradication and habitat restoration programmes established and operational									
Carry out risk assessments for local high priority species and existing populations of specified FINNS		———	———						
Initiate and complete catchment wide surveys by suitably trained personnel		.....	.....	.....	.....	.....	.....	.....	.....
Establish contacts for expert advice on identification and management for specific FINNS		———	———						
Identify and implement methods of monitoring and restricting the spread of FINNS where no adequate control mechanisms are currently in place		.....	.....	.....	.....	.....	.....	.....	.....
Produce database to manage FINNS records for control works		———	———						
Implement control programmes for specific established FINNS at a catchment level	.....	.....	.....	.....	.....	.....	.....	.....	.....
Implement habitat restoration scheme within successful control areas taking into account all relevant species at a catchment level			.....	.....	.....	.....	.....	.....	.....
Monitor the effectiveness of control programmes	.....	.....	.....	.....	.....	.....	.....	.....	.....
Identify and develop opportunities for future funding of eradication projects	.....	.....	.....	.....	.....	.....	.....	.....	.....
Objective 4: Establish a sustainable management framework to coordinate actions of local and catchment based partners									
Output 4.1 – Local organisations and partners implementing coordinated management actions									
Complete draft Cumbria Freshwater Biosecurity Plan	———	———							
Consult with all partners of the Cumbria Forum to confirm actions in Cumbria Freshwater Biosecurity Plan	———	———							
CFINNS Initiative Coordinator post embedded within SCRT	———	———							
Establish good communication between national, county and local partners	.....	.....	.....	.....	.....	.....	.....	.....	.....
Establish a county-wide education programme to raise awareness of FINNS		.....	.....	.....	.....	.....	.....	.....	.....

ACTION	TIMEFRAME								
	2011	2012	2012	2013	2013	2014	2014	2015	2015
Secure sustainable funding for CFINNS Coordinator post and LAGs for actions to implement the Cumbria Freshwater Biosecurity Plan	.....	.....	.....	.....	.....	.....	.....	.....	.....
Establish strategic work programmes and employ seasonal catchment INNS Officers	.....	.....	.....	.....	.....	.....	.....	.....	.....
Disseminate best practice and new developments relating to FINNS to/between LAGs	.....	.....	.....	.....	.....	.....	.....	.....	.....
Identify needs and support building capacity for new LAGs	.....	.....	.....	.....	.....	.....	.....	.....	.....

6. Monitoring and Review

To ensure the effective implementation of this plan, it is vital that the outcomes and outputs of the actions are monitored and reviewed to ensure that the objectives are being met. Therefore a fully coordinated monitoring programme must be established which includes:

Monitoring on a countywide level (by CFINNS Initiative and Forum)

- Regular assessment of strength and breadth of partners support and achievements in implementation of the Plan.
- Assessment of the ability to close pathways of transmission to prevent entry of FINNS
- Monitoring the effectiveness of all legislation and codes of practice especially those which are aimed at restricting/closing pathways
- Assessment of efficacy of early detection through surveillance, monitoring and rapid response mechanisms.
- Regular liaison with Local Action Groups and provision of advice and assistance where necessary
- Monitoring general activities within the county and assessing them in terms of risk for the introduction of FINNS.
- Publicising successes locally, regionally and nationally in order to improve public awareness and participation.
- Monitoring of funding for Local Action Groups carrying out mitigation, control and eradication works.

Monitoring on a catchment level (Local Action Groups)

- Effectiveness of mitigation, control and eradication programmes including:
    - Checking that treatments have been effective
    - Re-treating in subsequent years if required
    - Monitoring any apparent resistance to treatments and investigate
    - Resurveying treated areas to ensure eradication
- Publicising successes locally and regionally in order to improve public awareness and participation

A monitoring programme will be developed based on the agreed objectives and outputs of this plan. The CFINNS Initiative will work with all partners to develop and agree protocols for FINNS surveying and monitoring. This will ensure compatibility with existing habitat survey methodology to ensure that high quality data are collected, stored and shared.

Monitoring activities will be undertaken by partners and volunteers as well as CFINNS Initiative staff in conjunction with stakeholder representatives who by virtue of their work are out in the catchment on a regular basis e.g. Rivers Trusts staff.

As part of the implementation, there will inevitably be responses from partners and inadequacies will be found with the Plan, therefore the Plan as a whole must be in a constant state of review.

Appendix 1

Identified Actions in the Cumbria Freshwater Biosecurity Plan supporting provisions or requirements of other relevant plans.

Provision or Requirement of Existing Plan	Action in Cumbria Biosecurity Plan
Plan: North West River Basin Plan. **Provision/s**: • Invasive species awareness, control and eradication programme for protected Natura 2000 sites	This plan fulfils the requirements of the North West River Basin Plan by: • Raising awareness of FINNS • Supporting control and eradication projects of FINNS on Natura 2000 sites in order to meet favourable conditions.
Plan: The Solway Tweed River Basin Management Plan and the (draft) Solway Area Management Plan. **Provision/s**: • The RBMP for Scotland river basin district contains the following measures relating to biosecurity; • 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.	This Plan 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; • Raise awareness of biosecurity issues and preventative measures to stop the spread • Act as a conduit for national initiatives into the local action. • Develop and encourage a catchment-based approach to control and eradication. • Ensure control methods do not impact on the water environment. • Monitor and report progress
Plan: Cumbria Biodiversity Action Plan **Provision/s**: • Maintain the quality of existing natural channels, flood plain features and dependant wildlife • Protect, maintain and wherever appropriate improve improve river and stream water quality • Enhance degraded river channels, flood plain features and dependant wildlife • Promote a wider awareness, understanding and appreciation of rivers and streams, their conservation needs and their sustainable use.	This Plan will support the broad objectives of the Cumbria BAP Plan: • Ensure control and eradication programmes for FINNS • Create areas for native species to grow • Raise awareness and understanding of freshwater habitats and of FINNS • Raise awareness of the issues surrounding FINNS and an understanding of freshwater systems • Raise awareness of preventative measures to stop the spread

Provision or Requirement of Existing Plan	Action in Cumbria Biosecurity Plan
Plan: The Solway Coast AONB Management Plan 2010-2015 **Provision/s**: Policy NH1.5 - Reduce invasive & non native plant species that threaten the special character of the area	This Plan will support the policy objective: • Ensure control and eradication programmes for FINNS • Raise awareness of the issues surrounding FINNS and an understanding of waters. • Raise awareness of preventative measures to stop the spread of FINNS
Plan: Morecambe Bay Management Scheme Action Plan 2008-2011 **Provision/s**: ME6 – Monitor distribution of alien species such as wireweed and chinese mitten crab	The Plan will support the Scheme Action Plan: • Ensure control and eradication programmes for FINNS • Monitor distribution of FINNS • Raise awareness of FINNS and the preventative measures to stop the spread
Plan: Lake District National Park Partnership Plan **Provision/s**: A Biosecurity Plan is being developed for the county to address freshwater non-native species from which a Catchment Action Plan can be developed.	The Plan will support the Scheme Action Plan: • This is the Cumbeia Freshwater Biosecurity Plan
Plan: Lake District National Park Biodiversity Strategy and Action Plan **Provision/s**: 1.6 - Continued work on alien species control working with local communities: Windermere catchment; Bassenthwaite catchment and Kent catchment.	The Plan will support the Action Plan: • Ensure control and eradication programmes for FINNS • Raise awareness of the issues surrounding FINNS and the preventative measures to stop the spread • Monitor the distribution of FINNS
Plan: Lake District National Park 'Strategy for access to lakes and rivers and the coast.' **Provision/s**: Develop greater awareness of invasive species	The Plan will support the Strategy: • Raise awareness of the issues surrounding FINNS and an understanding of waters. • Raise awareness of preventative measures to stop the spread of FINNS

Appendix 2

The three categories of Notifiable Diseases in Fish governed by the Fish Health Regulations 1997.

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

Infectious Salmon Anaemia (ISA)

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

Viral Haemorrhagic Septicaemia (VHS)

Infectious Haematopoetic Necrosis (IHN)

List III diseases are those for which individual Member States can decide whether to put control measures in place or not, including:

- Infectious Pancreatic Necrosis (IPN)
- Bacterial Kidney Disease (BKD)
- Furunculosis
- Spring Viraemia of Carp (SVC)
- *Gyrodactylus salaris* (Gs)
- Enteric Redmouth Disease (ERM)

Appendix 3

Animals and Plants listed in Section 14, Schedule 9 of the Wildlife and Countryside Act 1981 with 2010 amendments:

Mammals
Wild boar, *Sus scrofa*
Chinese water deer, *Hydropotes inermis*

Birds
Northern goshawk**,** *Accipiter gentilis*
Snow goose*, Anser caerulescens*
Emperor goose*, Anser canagicus*
Bar-headed goose*, Anser indicus*
Barnacle goose*, Branta leucopsis*
Eagle owl*, Bubo bubo*
Corncrake*, Crex crex*
Black swan*, Cygnus atratus*
Common crane*, Grus grus*
Red kite, *Milvus milvus*
Monk parakeet, *Myiopsitta monachus*
Red-crested pochard, *Netta rufina*
Red-billed chough, *Pyrrhocorax pyrrhocorax*
Ruddy shelduck, *Tadorna ferruginea*

Invertebrates
Australian flatworm, *Australoplana sanguinea*
Flatworm, *Kontikia andersoni*
Flatworm, *Kontikia ventrolineata*
Slipper limpet, *Crepidula fornicata*
Chinese mitten crab, *Eriocheir sinensis*
Spiny-cheek crayfish, *Orconectes limosus*
Red swamp crayfish, *Procambarus clarkii*
American oyster drill, *Urosalpinx cinerea*

Plants

Few flowered leek, *Allium paradoxum*
Three cornered garlic, A*llium triquetrum*
Water fern, *Azolla filiculoides*
Carolina water-shield, *Cabomba caroliniana*
Hottentot fig, *Carpobrotus edulis*
Cotoneaster, *Cotoneaster bullatus*
Cotoneaster, *Cotoneaster horizontalis*
Cotoneaster, *Cotoneaster integrifolius*
Cotoneaster, *Cotoneaster microphyllus*
Cotoneaster, *Cotoneaster simonsii*
Crocosmia x crocosmiiflora
New Zealand pygmyweed, *Crassula helmsii*
Purple dewplant, *Disphyma crassifolium*
Water hyacinth, *Eichornia crassipes*
Elodea species
Japanese knotweed - *Fallopia japonica*
Hybrid knotweed, *Fallopia japonica x sachalinensis*
Giant knotweed, *Fallopia sachalinensis*
Giant rhubarb, *Gunnera tinctoria*
Floating pennywort, *Hydrocotyle ranunculoides*
Himalayan balsam, *Impatiens glandulifera*
Curly waterweed, *Lagarosiphon major*
Variegated yellow archangel, *Lamiastrum galeobdolon montanum (syn Lamiastrum galeodbolon argentatum)*
Water primrose, *Ludwigia grandiflora*
Floating water primrose, *Ludwigia peploides*
Water primrose, *Ludwigia uruguayensis*
Parrots feather, *Myriophyllum aquaticum*
False virginia creeper, *Parthenocissus inserta*
Virginia creeper, *Parthenocissus quinquefolia*
Water lettuce, *Pistia stratiotes*
Yellow azalea, *Rhododendron luteum*
Rhododendron, *Rhododendron ponticum*
Rhododendron, *Rhododendron ponticum x Rhododendron maximum*
Japanese rose, *Rosa rugosa*
Duck potato, *Sagittaria latifolia*
Giant salvinia, *Salvinia molesta*
Perfoliate alexanders, *Smyrnium perfoliatum*

Algae

Green seafingers, C*odium fragile*
Red algae, *Grateloupia luxurians*