IRELAND'S INVASIVE ALIEN SPECIES **ANGLING** PATHWAY ACTION PLAN 2022 – 2027

Actions to reduce the risk of introduction and spread of invasive alien species transported by angling activities

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This document was prepared by the National Biodiversity Data Centre on behalf of the National Parks and Wildlife Service. Key to its drafting is the participation and contribution by the Angling Invasive Alien Species Pathway Action Plan Working Group.

This Pathway Action Plan builds upon the guidance issued in the 2014 European Code of Conduct on Recreational Fishing and Invasive Alien Species, Inland Fisheries Ireland biosecurity guidance and, the United Kingdom Check Clean Dry biosecurity campaign amongst others.

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An **Invasive Alien Species** is a species occurring in an area outside of its historically known natural range as a result of intentional or accidental dispersal by human activities and whose introduction or spread, has been found to threaten or adversely impact upon biodiversity and related ecosystem services.

Introduction

Once invasive alien species are introduced and become established in waterbodies it can be very difficult, if not impossible, to control or eradicate them. Their introduction can have a significant negative impact on the other species present, the functioning of the waterbody and how people interact with it. As invasive alien species can be unintentionally transported as stowaways with angling and fishing equipment, action is needed to reduce the risk of introducing and spreading invasive alien species into and between waterbodies in Ireland by this pathway.

Development of pathway action plans to tackle priority pathways is a requirement under the EU Invasive Alien Species Regulation[1]. This Angling Pathway Action Plan targeting the transport of invasive alien species with angling and fishing equipment is one of a series of plans intended to reduce the risk of introduction and spread of invasive alien species in Ireland.

This Angling Pathway Action Plan outlines the general policy approach to tackling this pathway and what actions government and those involved with angling and fishing in Ireland can undertake.

Scope

The scope of this Angling Pathway Action Plan is on activities related to angling in the freshwater and brackish environment. This includes trout, salmon, coarse, pike and shore fishing, and both wild and stocked fisheries but excludes aquaculture. While the geographic scope of the plan is the Republic of Ireland, given the significant connectivity, close proximity and ease of access between cross border waterways, aspects with Northern Ireland are referred to as well as linkages with Great Britain and continental Europe.

This Angling Pathway Action Plan is aimed at all those that engage in recreational fishing and fisheries whether anglers, angling governing bodies, clubs or affiliated angling groups, those that are commercially engaged with recreational fishing (such as fishing tour operators), and agencies that regulate recreational fishing.

The key actions are aimed at preventing and minimizing the risk of unintentional introduction and spread of invasive alien species through angling activities. Intentional activities such as the deliberate introduction of fish or other species to Ireland or transfer between catchments, is illegal. Actions aimed at these intentional illegal activities are outside the scope of this pathway action plan.

Description of the target pathway

What is this pathway?

Plants, animals or pathogens can be unintentionally transported as stowaways with angling and fishing equipment. For example, someone fishes in an area where invasive alien species are present,

[1] The official title of the EU Invasive Alien Species Regulation is: Regulation (EU) No 1143/2014 of the European Parliament and of the Council of 22 October 2014 on the prevention and management of the introduction and spread of invasive alien species.

and the species inadvertently becomes attached to the angling or fishing equipment. If the equipment has not been properly checked, cleaned and dried and/or disinfected before being used in another waterbody, the invasive alien species may survive transport on the equipment and be introduced into another waterbody.

Angling and fishing equipment include anything that has been used in or near the water that the species can stowaway on such as fishing tackle, fishing lines, nets, waders/boots, stink bags, fishing kayaks, boats, boat trailers or vehicles used in or near the waterbody. It has been shown that some invasive alien species do not need to be submerged in water during transport but can survive in damp conditions.

This pathway refers to both angler movement into Ireland after fishing abroad, and to angler movements between catchments/waterbodies in Ireland.

What is the scale of the activity related to this pathway in Ireland?

Ireland has an abundance of freshwater environments with over 12,200 lakes, an extensive river network estimated to be 74,000km in length[2] and artificial or heavily modified water bodies including reservoirs and canals. In the years 2012[3], 2015[4] and 2021[5], Inland Fisheries Ireland (IFI) commissioned various socio-economic studies and surveys to assess the volume, value and economic impact of recreational angling in Ireland. The main findings of this and subsequent surveys were:

- In 2021, surveys estimated that 327,000 adults resident in Ireland go fishing.
- Fáilte Ireland figures indicate that a 5-year average of 146,000 overseas visitors went fishing in Ireland each year from 2015 to 2019.
- The total direct expenditure on recreational angling is estimated to have risen to over €600 million in 2015.
- The overall economic impact of recreational angling in 2015 was estimated to be approximately €836 million.
- Total tourist angling expenditure can be estimated at approximately €280 million.
- Recreational angling was estimated to support approximately 11,000 jobs in 2015.

The participation patterns of anglers elucidated in the 2012 Socioeconomic Study of Recreational angling in Ireland (published in 2013) provides a valuable insight into the level of angling activity and movement of the anglers.
Of the 406,000 individuals participating in recreational angling in Ireland in 2012, over 150,000 of those travelled from Northern Ireland and overseas. The overseas anglers are very loyal to Ireland and to specific fisheries with individuals returning to the same fishery. The overseas recreational anglers made an average of two angling trips to Ireland in the previous 12 months. Angler survey

[2] H.B. Feeley et al. (2014-W-LS-5). Irish Freshwater Resources and Assessment of Ecosystem Services Provision EPA Research Report. Available online: www.epa.ie/pubs/reports/research/water/EPA%20RR%20207%20final%20web-2.pdf [Accessed: 21/03/2020]
[3]Tourism Development International (2013). Socio-Economic Study of Recreational Angling in Ireland. Prepared on behalf of Inland Fisheries Ireland. Available online: https://www.fisheriesireland.ie/media/tdistudyonrecreationalangling.pdf [Accessed: 21/03/2020]
[4] Inland Fisheries Ireland (2015). National Strategy for Angling Development (NSAD) 2015-2020
[5] Inland Fisheries Ireland/Economic and Social Research Institute Omnibus Survey Results, Unpublished Data

data from Great Britain, shows that in 2015 and 2018, Ireland was the second most popular abroad angling fishing destination after France[6].
Domestic anglers participating in day fishing trips took an average of 13.6-day angling trips. One in four domestic anglers took an overnight fishing trip – the average number of overnight trips taken by these anglers was 5.25. The 2012 study found that 41% of all recreational anglers have taken a holiday involving angling in other countries in the previous 3 years with Scotland, England, Spain and Scandinavia being the most popular competitor countries visited.

These surveys highlight the level of domestic and overseas movement of anglers and therefore also the associated risks of unintentional movements of invasive alien species between these areas.

Angler movements to and within Ireland, are an intrinsic element of the socio-economic value of recreational angling. Inland Fisheries Ireland's 2015 *National Strategy for Angling Development* aims to increase angling activity both domestically and from overseas visitors. However along with measures to promote engagement in this sector, measures to reduce the risk of negative socio-economic impacts on this sector by invasive alien species are also required. Since the 1980's the rate of introduction of freshwater aquatic invasive species has accelerated[7] with introduction of invasive alien species such as Zebra mussel (*Dreissena polymorpha*), Asian clam (*Corbicula fluminea*), Quagga mussel (*Dreissena rostriformis bugensis*), Chub (*Squalius cephalus*) and pathogens such as the crayfish plague (*Aphanomyces astaci*) being introduced into Ireland. The number of locations that freshwater invasive alien species are being recorded in within Ireland is also increasing. With more invasive species poised to be introduced to Ireland from Great Britain and continental Europe, good levels of awareness and implementation of biosecurity measures by all relevant stakeholders are required.

In general, the term **biosecurity** relates to measures taken to prevent the introduction and spread of living organisms.

In the absence of implementing appropriate biosecurity measures, there is an increased potential for the inadvertent spread of viable invasive alien species overland in Ireland or cross-channel on fishing and angling equipment from infested to un-infested waters. This risk has been recognised in the Tourism Masterplan for the Shannon 2020-2030.[8] This plan sets out an integrated framework for sustainable tourism development along the Shannon and Shannon Erne Waterway repositioning the region as a key tourism destination within Ireland's Hidden Heartlands. Formal biosecurity standards for the inland waterways are set out in the plan, see Box 1. This provides an example approach for

[6] Smith, E.R.C., Bennion, H., Sayer, C.D. et al. Recreational angling as a pathway for invasive non-native species spread: awareness of biosecurity and the risk of long distance movement into Great Britain. *Biol Invasions* 22, 1135–1159 (2020). https://doi.org/10.1007/s10530-019-02169-5
[7] O'Flynn, C., Kelly, J., Lysaght, L. (2014). Ireland's invasive and non-native species – trends in introductions. National Biodiversity Data Centre Series No. 2. Ireland.
[8] The Shannon Mighty River of Ireland A Tourism Masterplan for the Shannon 2020 – 2030 Reimagining the River Shannon and Shannon Erne Waterway. Available from: https://online.flippingbook.com/view/569022/

setting actions to counteract the potential risk of introduction and spread of invasive species as part of sustainable tourism.

Box 1. Tourism Masterplan for the Shannon 2020-2030

Section 6.6.4 of the Plan 'proposes a number of formal biosecurity standards for the inland waterways to be implemented which aim to prevent the inadvertent disruption of the Shannon's natural ecosystems. These measures are required across the masterplan area.

Draft standards were developed as part of the masterplan, which focus on communications, freshwater security measures for small boats and standards for leisure and industrial craft entering the system.

The introduction of biosecurity facilities at designated entry points should be considered for all users along the Shannon to reduce the risk of further introduction or spread of invasive species. These should include:

- ✓ anti-fouling stations for routine boat cleansing procedures.
- ✓ cleansing / power washing stations for incoming/outgoing craft.
- ✓ well placed and well serviced pumping stations to prevent unlicensed bilge discharge; and
- ✓ spot inspections by licensed navigation staff.'

Policy and legal context

The prevention of introduction of non-native and potentially invasive alien species into Europe and Ireland has long been a feature in legislation and policy. The most relevant European policy instruments include the Bern Convention[9], the Water Framework Directive, the Marine Strategy Framework Directive and more recently, the 2014 EU Invasive Alien Species Regulation[1]. Relevant domestic legislative instruments include:

- Wildlife Act 1976 – updated to 21 November 2021[10]
- Wildlife (Amendment) Act, 2000[11]
- S.I. No. 477/2011 - European Communities (Birds and Natural Habitats) Regulations 2011[12]
- European Communities (Marine Strategy Framework) Regulations S.I. No. 249 of 2011[13]

National policy includes actions under:

- Ireland's third *National Biodiversity Action Plan 2017-2021*[14] whereby Target 4.4 states that 'Harmful invasive alien species are controlled and there is reduced risk of introduction and/or spread of new species.' This is supported by seven actions in the plan.

- The *Biodiversity Climate Change Sectoral Adaptation Plan*[15] whereby Action 1.6. is to 'Establish and implement an all-island invasive species programme to monitor the spread of terrestrial, aquatic and marine invasive species in a changing climate and control invasive species where their spread is considered problematic'.

[9] https://www.coe.int/en/web/bern-convention
[10] https://revisedacts.lawreform.ie/eli/1976/act/39/revised/en/html
[11] www.irishstatutebook.ie/eli/2000/act/38/enacted/en/print.html
[12] www.irishstatutebook.ie/eli/2011/si/477/made/en/print
[13] www.irishstatutebook.ie/eli/2011/si/249/made/en/print
[14] www.npws.ie/sites/default/files/publications/pdf/National%20Biodiversity%20Action%20Plan%20English.pdf
[15] www.npws.ie/news/biodiversity-climate-change-sectoral-adaptation-plan

- The *Marine Strategy Framework Directive (MSFD) (Directive 2008/56/EC)*[16] whereby Descriptor 2 stipulates that 'non-indigenous species introduced by human activities are at levels that do not adversely alter the ecosystems'. Ireland's environmental target for non-indigenous species aligned to the primary criterion for this descriptor is 'The number of non-indigenous species which are newly introduced via human activity into the wild, per assessment period is minimised and where possible reduced to zero.'
- The Water Framework Directive (WFD) (Directive 2000/60/EC)[17] whereby in Ireland invasive alien species are considered a significant pressure. 'The river basin public consultations on significant water management issues in 2015 identified Invasive Aquatic Species (IAS) as a significant issue for water management.' It has been further identified that 'invasive species are a significant pressure impacting 42 or 1.8% of the 1,460 'At Risk' water bodies. This total of 42 is made up of 7 river and 35 lake water bodies.'[18]

Guidance aimed at recreational fishing and water use activities to reduce the introduction and spread of invasive alien species have been promoted in the past. In 2008, the European Inland Fisheries Advisory Commission (EIFAC) Code of Practice for Recreation Fisheries[19] was published, principles of which were incorporated into the 2013 European Code of Conduct on Recreational Fishing and Invasive Alien Species[20]. From circa 2010, Inland Fisheries Ireland developed and led a biosecurity campaign with recreational water users. Since 2018, the Department of Housing, Local Government and Heritage have been promoting the Check Clean Dry (CCD) public awareness campaign aimed at improving biosecurity amongst water users. The CCD campaign is adopted across Ireland, Northern Ireland, Great Britain, the Isle of Mann and Channel Island governments thus providing a readily recognisable and consistent biosecurity messaging across those areas.

Aim and objectives

The aim of this Angling Pathway Action Plan is to reduce the risk of invasive alien species being introduced to Ireland and spread from one waterbody to another within Ireland by angling activities. Successful implementation of the Angling Pathway Action Plan will support implementation of regulation and policy and ultimately will reduce the impacts of invasive alien species on waterbodies while safeguarding the ecosystem services and socio-economic benefits they deliver.

The **objectives** of the Angling Pathway Action Plan are:

A. Increase the level of awareness of invasive alien species issues amongst anglers.
B. Increase level of awareness on how good biosecurity actions, incorporated into angler activities, can reduce the risk of introduction and spread of invasive alien species.
C. Facilitate the uptake of good biosecurity practice by the angling community.
D. Communicate issues relating to invasive alien species with the identified key stakeholders, fisheries owners, riparian land managers (private and public), boaters and the media.

[16] http://ec.europa.eu/environment/marine/eu-coast-and-marine-policy/marine-strategy-framework-directive/index_en.htm
[17] https://ec.europa.eu/environment/water/water-framework/index_en.html
[18] www.catchments.ie/significant-pressures-invasive-species/
[19] FAO European Inland Fisheries Advisory Commission. EIFAC Code of Practice for Recreational Fisheries. EIFAC Occasional Paper. No. 42. Rome, FAO. 2008.
[20] Council of Europe. Recommendation N°170 (2014) on the European Code of Conduct on Recreational Fishing and Invasive Alien Species. Strasbourg, 5 December 2014.

E. Encourage all stakeholders to report alert level invasive alien species to the National Biodiversity Data Centre.
F. Set Angling Pathway Action Plan outcomes to enable a review and evaluation of the implementation of the actions.

Identification of Key Stakeholders

Achieving the aim of this Angling Pathway Action Plan is dependent on the close cooperation between the Department of Housing, Local Government and Heritage and other government agencies along with the key stakeholders to reduce the risk of further introduction and spread of invasive alien species to Ireland's waters. The key stakeholders identified for this Angling Pathway Action Plan are:

- Angling Council of Ireland
- Department of Environment, Climate and Communications
- Department of Housing, Local Government and Heritage
- Electricity Supply Board
- Environmental Protection Agency
- ERVIA
- Fáilte Ireland
- Federation of Irish Salmon and Sea Trout Anglers
- Inland Fisheries Ireland
- Irish Anglers Development Alliance
- Irish Federation of Pike Angling Clubs
  Irish Water
- Local Authority Waters Programme
- Loughs Agency
- National Anglers Representative Association
- National Biodiversity Data Centre
- National Coarse Fishing Federation of Ireland
- National Parks and Wildlife Service
- Salmon and Sea Trout Recreational Anglers of Ireland
- Sport Ireland
- Trout Anglers Federation of Ireland
- Waterways Ireland

This list of Key Stakeholders is not exhaustive and other may be identified or forthcoming over the term of the Angling Pathway Action Plan.

Key Actions and Outcomes

Raising awareness

Action 1
Appropriately government funded survey of angler levels of awareness on invasive alien species issues and biosecurity in 2023 to determine the baseline level of knowledge. Survey to be repeated in 2026 to provide a measure of the effectiveness of awareness raising activities.
Outcome: A measure of the effectiveness of actions taken to increase awareness on invasive alien species issues and aquatic biosecurity measures. It is expected there would be an increased level of awareness and adoption of biosecurity actions.

Action 2
The Angling IAS Pathway Action Plan Working Group will review and refine where necessary biosecurity campaign messaging and guidelines.
Outcome: Angling IAS Pathway Action Plan Working Group supported biosecurity campaign messaging and guidelines.

Action 3
The National Parks and Wildlife Service will implement a border biosecurity awareness campaign targeting high risk routes of entry to Ireland.
Outcome: Border biosecurity programme delivered and sustained over the term of the plan.

Action 4
Inland Fisheries Ireland, Electricity Supply Board, fishery owners and other state bodies as relevant, will make all angling licence/permit holders aware of biosecurity guidelines on application or issue of angling licences/permits where possible.
Outcome: Provisions in place to make anglers aware of biosecurity guidelines on application or with issue of licence/permit. For example, by display of the Check Clean Dry logo on angling licences/permits and/or a link to additional biosecurity guidance information.

Action 5
Angling event organisers will raise awareness of biosecurity guidelines to participants prior to events and support implementation of biosecurity actions including the 'no dip – no draw' clean kit policy at events.
Outcome (a): Reduced risk of introduction and spread of invasive alien species from angling events.
Outcome (b): Sponsors of angling events to only support events that implement full "No dip - no draw" clean kit policy to ensure entrants undertake biosecurity cleaning prior to taking part and after the event.

On-site measures

Action 6
Irish Government supported by the Aquatic Invasive Alien Species and Biosecurity Technical Advisory Group, will identify and coordinate emergency biosecurity response procedures at sites when a newly introduced priority concern alert list invasive alien species has been detected. One such measure could include the restriction of water-based activities at that site.
Outcome: Containment or significant reduction in risk of spread of the invasive alien species from the contaminated site. The type and duration of the emergency biosecurity measures to be implemented are likely to be considered on a case-by-case basis and advised by government.

Action 7
All Anglers - the biosecurity regime of Check Clean Dry should be used as a regular practice and will be used when moving from one waterbody to another.
Outcome: Increase in the number of anglers using the regime of Check Clean Dry as standard practice occurrence thus reducing the risk of introduction and spread of invasive species

Action 8
Site or fishery owners, managers, or any other key stakeholders (including those identified in this Pathway Action Plan) with stewardship of aquatic sites/waterways will promote biosecurity awareness (e.g., signage and/or other awareness mechanism) and provide biosecurity facilities where possible at well-known match/competition stretches and slipways and other popular water entry/egress site points.
Outcome: Implementation of biosecurity measures are promoted and facilitated on-site where possible.

Action 9
Owners and managers of sites/waterways that contain invasive alien species of priority concern (Appendix III) and where angling occurs, will install signage and facilities where possible, to promote and facilitate very high levels of awareness and biosecurity to reduce the risk of spread from the site. This may include:

- Large prominent signage
- Suitable hard standing area
- Wash down facilities (hot water where possible)
- Regular inspection to ensure implementation of biosecurity practices by anglers.

It is likely that this will need to be evaluated for risk management on a case-by-case basis by the owner/manager of the site. A toolkit will be made available to aid the evaluation of risk management.
Outcome: Where implemented, there will be containment of the invasive alien species or significant reduction in risk of spread from the site of the invasive alien species of priority concern.

Action 10
Irish Government will through the relevant authorities, introduce inspection checks (that are backed-up by robust legislation) on angling and water sport equipment/vehicles (including associated tow trailers) entering Ireland at prime concern border port and airport entry points to ensure they are clean (free of invertebrates, plants, soil, mud, slime layer), drained, and to the extent practical are dry.
Outcome: If on inspection, the angling and water sport equipment or vehicles do not pass biosecurity checks, they may be refused entry into Ireland or be required to follow decontamination and/or quarantine procedures. This is to prevent the inadvertent introduction of potentially invasive alien species to Irish waters.

Policy and coordination

Action 11
The National Parks and Wildlife Service will continue to liaise with the European Commission and relevant EU Member States on a programme of regional cooperation related to aquatic biosecurity.
Outcome: National Parks and Wildlife Service participation in the Aquatic Regional IAS Pathway Action Plan Cooperation group meetings. To include annual sharing of information on priority international water sport events to allow target of these events to promote biosecurity awareness and encourage organisers and participants to implement biosecurity measures.

Action 12
Angling representative groups will help facilitate and encourage the uptake of good biosecurity practices by all angling clubs through:

- Providing biosecurity training [online and/or seminars]
- Encourage angling clubs to add a biosecurity clause to their constitutions or by adopting a Biosecurity Code of Practice.

Outcome: Angler led encouraged and facilitated up-take of biosecurity training and adoption of biosecurity policies.

Action 13
The National Parks and Wildlife Service will coordinate policy response and actions with the Northern Ireland government and other administrations as necessary - including on the border biosecurity campaign.
Outcome: Coordination of policy response and actions as and when appropriate with the Northern Ireland government and other agencies. Particularly on coordination of border biosecurity campaigns between the island of Ireland, Great Britain and other western Europe administrations as the opportunity arises.

Action 14
The Angling IAS Pathway Action Plan Working Group will ensure coordination of actions in this plan with Ireland's Invasive Alien Species Recreational Boating and Watercraft Pathway Action Plan where relevant.
Outcome: Coordinated actions that support and strengthen the overall measures taken to reduce the risk of introduction and spread of invasive alien species into the aquatic environment.

Reporting

Action 15
The Angling IAS Pathway Action Plan Working Group members will on an annual basis at least, up-date the Detailed Table of Actions that they commit to undertaking over the term of the Angling Pathway Action Plan. Key Stakeholders may also contribute their actions. The Detailed Table of Actions will be maintained by the Working Group and made available from National Biodiversity Data Centre's invasive species website: https://invasives.ie/biosecurity/pathway-action-plans/.
The Angling IAS Pathway Action Plan Working Group members, key stakeholders and any additional association or club should also log their actions in relation to this Pathway Action Plan on the *Actions on Invasives* portal https://actionsoninvasives.biodiversityireland.ie/

Outcome (a): Actions logged provide data that can be used as a metric for assessment of implementation of this pathway action plan. For example, a measurable outcome for Action 15 would be (i) numbers participating in biosecurity training events provided, and (ii) number of angling clubs with biosecurity clause or adoption of Biosecurity Code of Practice in their constitutions.

Outcome (b): Log of actions undertaken provides visibility of the efforts being made by those implementing the actions in support of meeting the aim of this pathway action plan thus better protecting the aquatic environment from invasive alien species.

Action 16
All - report priority concern alert invasive alien species (Appendix III) sightings to the National Biodiversity Data Centre using the online invasives recording form (https://records.biodiversityireland.ie/record/invasives) or the Biodiversity Data Capture app.

Outcome: Early detection and reporting of the alert species to the National Biodiversity Data Centre facilitates early warning of the species presence and provides for verification, notification, and consideration of rapid response measures.

Action 17
The National Biodiversity Data Centre will compile and maintain a list or map of sites, waterways or catchments which contain priority concern list invasive alien species (Appendix III) that are a priority to contain or slow the spread. Compilation of this list will be supported by input from the Angling IAS Pathway Action Plan Working Group and the Aquatic Invasive Alien Species and Biosecurity Technical Advisory Group.
Outcome: A list of sites, waterways or catchments which contain priority concern invasive alien species will be maintained and made available to inform risk management and biosecurity response actions.

Action 18
Interim and final review of the Pathway Action Plan by the Angling IAS Pathway Action Plan Working Group to measure progress on implementation of actions and identify areas for improvement with adjustment of actions where needed.
Outcome: Interim and final review completed to aid in improvement of the Pathway Action Plan and any follow-on plan.

Horizontal measures to support implementation of the Key Actions

To support implementation of the Key Actions in this Angling Pathway Action Plan, underlying horizontal measures will need to be addressed.

Measure A – Establish an Aquatic Invasive Alien Species and Biosecurity Technical Advisory Group
The Department of Housing, Local Government and Heritage will by 2023, establish an Aquatic Invasive Alien Species and Biosecurity Technical Advisory Group. The function of the group will be to:

- Periodically review the priority concern alert list of aquatic invasive alien species.
- Advise on production of biosecurity related assessment and guidance documents.
- Advise on emergency biosecurity response procedures.
- Establish a risk status categorization hierarchy that can be used to guide risk management of aquatic sites that contain high priority concern and alert list invasive alien species.
- Input into the compilation of a list of sites, waterways or catchments which contain priority concern invasive alien species (Appendix III) that are a priority to contain or slow the spread.
- Review and up-date as necessary the Invasive Species Ireland Water Users Code of Practice[21]
- Other functions as determined on establishment of the Group.

Measure B – Produce biosecurity measure guidance documents
Irish government will by 2023, produce a suite of guidance documents to support implementation of biosecurity measures. These will include - but are not limited to:

[21] Kelly, J. and Maguire, C.M. (2008). Water Users Code of Practice. Prepared for NIEA and NPWS as part of Invasive Species Ireland. Available from: Water_Users_CoP.pdf (invasives.ie) [Accessed: 28/03/2022]

- the safe and legal use of aquatic disinfectants
- installation and use of cleaning and disinfection stations
- Angling Event biosecurity guidance.

Measure C – Boat movement restrictions
Irish Government will scope the feasibility to limit boats to waterbodies or catchments in Ireland. Also, to determine a protocol or code of practice for the movement of more transient watercraft such as canoes, kayaks, jet-skis etc.

Measure D - Funding
National Parks and Wildlife Service will in 2022 identify a funding mechanism for implementation of this Pathway Action Plan.

Measure E - Policy and legislation
1) Irish Government will introduce (if needed) robust legislation in Ireland to put in place border biosecurity measures including: a clean and dry or disinfected angling gear biosecurity declaration on passenger entry forms; angling gear and associated equipment and vehicle inspection checks; cleaning or quarantine of equipment as required; and penalties for failure to comply. National legislation or Bye-Laws (where possible) should establish the implementation of biosecurity measures at high risk sites for invasive species introduction or spread. Authorized Officers will have authority to inspect, quarantine or seize any angling equipment or water sport equipment and vehicles that don't comply.

This must be backed with the resources to implement and enforce it including adequate training of Custom Inspectors or other relevant Authorized officials and the provision of suitable facilities to carry out their duties.

2) Government departments, state agencies (including cross-border agencies) and national utilities with roles in invasive alien species management or those that are involved in management of our aquatic environment in Ireland, will develop and adopt invasive alien species biosecurity plans.

Measure F - Knowledge gaps
A systematic baseline survey with follow-on periodic monitoring of freshwater, brackish and riparian aquatic invasive alien species is required to provide a more informed and accurate assessment of risk status and risk management.

Fulfilment of these horizontal measures where possible, will compliment and facilitate the implementation of many of the actions in Ireland's Invasive Alien Species Recreational boating and Watercraft Pathway Action Plan.

Pathway Action Plan management

The National Parks and Wildlife Service, assisted by the National Biodiversity Data Centre, will coordinate development of the Angling Pathway Action Plan and monitoring of implementation of the Angling Pathway Action Plan.

The Angling Invasive Alien Species Pathway Action Plan Working Group will meet at least annually to input into the Actions 2, 12, 14, 15, 17 and 18 and to assess progress of the implementation of the

Angling Pathway Action Plan. An interim and final review will compile and assess quantitative data of outcomes and include discussion of strengths and weaknesses of the current provisions as well as suggestions for improvement. The interim and final review will include consultation feedback from those identified with implementation of the Angling Pathway Action Plan actions.

Time schedule

The time schedule for development and implementation of this Angling Pathway Action Plan is given in Table 1. It is envisaged that a follow-up Angling Pathway Action Plan will be issued for the period 2028 to 2032.

Table 1. Angling Pathway Action Plan time schedule

Task	2021	2022	2023	2025	2027
Complete the draft Angling Pathway Action Plan	Q3				
Issue the Draft Angling Pathway Action Plan for public consultation	Q4				
Final version of the Angling Pathway Action Plan		Q1			
Horizontal measures will be addressed (insofar as is possible)		Q1-Q4			
Implementation of Key Actions will commence by 2023 – where possible. Some already in progress.			Q1		
Interim review of Angling Pathway Action Plan actions/outcomes				Q2	
Final Review of Angling Pathway Action Plan					Q3

Summary note

The success of Ireland's Invasive Alien Species Angling Pathway Action Plan and the capacity for it to achieve its aims and objectives is very much dependent on a meaningful collaboration and partnerships with key stakeholders including individual anglers, fishing clubs, non-governmental organisations, and government. Successful implementation will go a long way in protecting our rivers and lakes and the wildlife and people that depend on it.

In keeping with the principles of the European Code of Conduct on Recreational Fishing and Invasive Alien Species, 'it is anticipated that through education and awareness recreational fishing will form part of the solution in tackling invasive alien species by acting as the eyes and ears of the rivers and lakes' of Ireland. This includes actions in spotting and reporting the spread of these species, as well as undertaking measures to prevent or significantly reduce the risk of introduction and spread of invasive alien species into and within Ireland.

APPENDIX I – Working Group members

The following organisations were represented on the Angling Invasive Alien Species Pathway Action Plan Working Group:

- Angling Council of Ireland
- Electricity Supply Board
- Federation of Irish Salmon and Sea Trout Anglers
- Inland Fisheries Ireland
- Local Authority Waters Programme
- Loughs Agency
- Marine Institute
- National Anglers Representative Association
- National Biodiversity Data Centre
- National Parks and Wildlife Service
- Salmon and Sea Trout Recreational Anglers of Ireland
- Waterways Ireland

The National Parks and Wildlife Service chair the working group and the National Biodiversity Data Centre provide administrative support.

Membership of the Working Group will remain open to new member organisations over the term of the Pathway Action Plan. You may make a request to join the Working Group by e-mail to invasives@biodiversityireland.ie.

APPENDIX II – Angling biosecurity guidance

Invasive plants and animals can carry diseases that kill fish and block waterways and banks interfering with fishing and other wildlife. They can be small, hard to spot or microscopic so are easily spread on damp equipment and clothing.
Angling biosecurity guidance refers to actions required to prevent or significantly reduce the risk of introduction and spread of invasive alien species through angling activities[22].

Anglers should always assume that the waterway contains invasive alien species and act accordingly with their subsequent movements to prevent spread

General procedure of the Check Clean Dry aquatic biosecurity protocol

Check, clean and thoroughly dry angling gear, equipment and clothing that come into contact with the water before using them again. If everything cannot be dry for at least 48 hours, then disinfect.

- **CHECK** your gear, clothing, and footwear after leaving the water for mud, aquatic animals, or plant material. Remove anything you find and leave it at the site.
- **CLEAN** everything thoroughly as soon as you can. Pay particular attention to nets, waders and areas that are damp and hard to inspect. If possible, use hot water (at least 45°C), high-pressure spray, or steam clean.
- **DRY** all equipment and clothing until dry for at least 48 hours – some species can live for many days or weeks in moist conditions.
    - **Disinfect** cleaned items *if* complete drying is not possible. Use a disinfectant such as Virkon Aquatic, Virasure or any other suitable proprietary disinfectant product. Items can be soaked, thoroughly sprayed or wiped down with disinfectant.

Protect the environment and fishing you enjoy by keeping your kit free of invasive plants and animals.

[22] Biosecurity guidance in this plan is adapted from the UK Check Clean Dry aquatic biosecurity campaign, from the Inland Fisheries Ireland biosecurity guidance and, from the Council of Europe Recommendation N°170 (2014) on the European Code of Conduct on Recreational Fishing and Invasive Alien Species.

Table 2. Angler biosecurity actions decision aid table

As an angler, what biosecurity actions do I need to undertake?			
Identify the fishing area (A, B or C)	**Entering Ireland to fish**	**Fishing in Ireland only**	
	A	**B**	**C**
	I have been fishing abroad and I'm going to use the same fishing gear in Ireland 	I regularly or sometimes fish in different water bodies/stretches of water 	I only fish in the same water body/stretch of water 
Risk Level	Very High ⚠⚠⚠	High ⚠⚠	Low ⚠
Risk	You could introduce invasive alien species or pathogens to Irish waters.	You could aid in spreading invasive alien species or pathogens to previously uninfected water bodies as you move from one catchment to another.	By fishing in the same area all the time you are at minimum risk of introducing or spreading invasive species. There is a low risk of aiding persistence of existing invasive species or pathogens
Principle	Your angling gear **must** be free of debris and organisms before you enter Ireland.	Your angling gear **must** be free of debris and organisms before you fish in a different water body.	Maintaining regular angling gear hygiene is good practice.
Action to undertake	Check, Clean and Dry all your angling gear. Thoroughly Dry all gear for at least 48 hours or Disinfect before using this equipment in Irish waters. 	Check, Clean and thoroughly Dry your angling gear for at least 48 hours or Disinfect before using this equipment in a different water body. 	Regularly Check, Clean and thoroughly Dry or Disinfect your angling equipment. 
Be aware	▪ Angling gear includes everything that comes into contact with the water including rods, nets, boots, waders, stink bags, etc. ▪ Desiccation is the most effective method to kill aquatic organisms. ▪ Where it is not possible to thoroughly dry equipment for 48 hours before using it in a different water body, the equipment must be disinfected. ▪ If disinfecting, use appropriate products such as Virkon Aquatic, Virasure or any other suitable proprietary disinfectant product. ▪ When disinfecting equipment, protective gloves should always be worn and the manufacturers' guidelines should be rigorously adhered to. ▪ If you are using a boat, then please also follow the biosecurity guidelines in Ireland's IAS Recreational Boating and Watercraft Pathway Action Plan. The principle is essentially the same; the boat must free from debris or organisms before being launched in Irish waters or on different water bodies.		

Inland Fisheries Ireland **Disinfection of Angling Equipment** guidance brochure. Produced and issued in draft 02/06/2011. Available online:

www.fisheriesireland.ie/what-we-do/research/research-theme-biosecurity

www.fisheriesireland.ie/Biosecurity/biosecurity-for-boaters-and-anglers.html

Please Note: up-dated biosecurity guidance as developed, will be available from: https://invasives.ie/biosecurity/check-clean-dry/ and the above Inland Fisheries Ireland webpages.

Aquatic Invasive Species (AIS) and fish pathogens are readily transferred from one watercourse to another on angling tackle, boats and protective clothing. These can be very damaging to resident fish stocks, the aquatic habitat and the general environment. In order to ensure that invasive species and fish pathogens are not inadvertently transferred into Ireland's waters from abroad or within the country from an infested water body to one that is free from these organisms, it is essential that all angling equipment is routinely inspected and disinfected following each fishing trip.

Items of angling equipment that require attention might include: protective clothing, including wellingtons and waders; boats, outboard motors and trailers; float tubes; rods, reels and line; and landing nets, keep nets, stink bags, weed rakes and unhooking mats.

Prior to leaving any watercourse following a fishing trip, the angler should routinely visually **inspect** all equipment that has been used in or exposed to the water. **Remove** and safely **dispose** of all attached plant or animal material. **Clean** and **disinfect** the equipment at the water's edge or later, as appropriate, making reference to the suggestions below.

Protective Clothing

- Clean, wash or disinfect (e.g. 1% solution of Virkon® Aquatic or another proprietary disinfection product) all articles of clothing.

- Footwear should be dipped in disinfectant solution (e.g. 1% solution of Virkon® Aquatic or another proprietary disinfection product) and thoroughly dried afterwards.

Nets, Storage Bags and Mats

- Landing nets, keep nets and stink bags should be immersed in disinfectant solution (e.g. 1% solution of Virkon® Aquatic or another proprietary disinfection product) for 15 minutes. They should then be rinsed in clean water and left to dry.

- Weed rakes and rope should be immersed in disinfectant solution following each fishing trip and thoroughly dried afterwards.

- Unhooking mats should be visually inspected, cleaned and washed with disinfectant solution, as outlined above.

Angling Tackle

- Rods should be sprayed or wiped down with a cloth soaked in an appropriate disinfectant solution (e.g. 1% solution of Virkon® Aquatic or another proprietary disinfection product), rinsed with clean water and dried.

- Spools and line should be immersed in disinfectant solution for 10 minutes, after which they should be rinsed in clean water and dried.

- Lures and floats should be immersed in disinfectant solution for 10 minutes, after which they should be rinsed in clean water and dried.

Boats, Outboard Motors and Trailers

- Visually inspect the boat, outboard motor and trailer once this equipment has been removed from the water. Remove all adherent plant and animal material and dispose of in sealed bags.

- Visually inspect and thoroughly clean the anchor, ropes and any other equipment used in the boat during the angling trip. These should also be immersed in/sprayed with disinfectant solution (e.g. 1% solution of Virkon® Aquatic or another proprietary disinfection product) and dried thereafter.

- Drain all water from the boat and from the outboard motor before moving to a different waterbody.

- Where possible, power hose the interior and exterior of the boat using heated water (60 °C/140° F). Where this is not possible, the boat should be washed before leaving the catchment and not reintroduced to any water for a period of at least 5 days.

- Cooling water should be drained from the outboard motor and, where possible, it should be flushed with disinfectant solution.

Protective gloves should always be worn when handling disinfectant and the manufacturers' guidelines should be rigorously adhered to.

Appendix III -Priority concern alert list of aquatic invasive alien species

This section provides a list of freshwater, marine and pathogen species of priority concern to keep out of Ireland and for which there may be a risk of introduction via angling and associated boating activities. Many of the species are present and widespread in Great Britain and mainland Europe and are at risk of being introduced to Ireland and spread to new catchments in Ireland via angling related activities.

Some of the species listed are present in Ireland and/or Northern Ireland but are localised to specific waterbodies or catchments. For these species, the aim is to reduce the risk of their introduction or spread in Ireland via angling activities.

The below three tables list the priority concern aquatic invasive alien species for which an alert would be issued on their detection in Ireland or in catchments they were previously unknown to occur in.

Freshwater

Scientific name	Common name	Taxon Group	Present in Ireland	Note
All non-native crayfish	Including: Signal crayfish; Virile crayfish; Rusty crayfish; Spinycheek crayfish; Noble crayfish; Turkish crayfish	Crayfish	No	Localised population of Yabby (*Cherax destructor*)
Alternaterna philoxeroides	Alligator weed	Plant	No	
Barbus barbus	Barbel	Fish	No	
Corbicula fluminea	Asian clam	Mollusc	Yes	In Shannon catchment
Dikerogammarus haemobaphes	Demon shrimp	Amphipod	No	
Dikerogammarus villosus	Killer shrimp	Amphipod	No	
Dreissena rostriformis bugensis	Quagga mussel	Mollusc	Yes	In Shannon catchment
Eriocheir sinensis	Chinese mitten crab	Crab	Yes	Localised
Hydrocotyle ranunculoides	Floating pennywort	Plant	Yes	Localised to one pond site but under eradication
Ludwigia grandiflora & Ludwigia peploides	Water primrose	Plant	Yes	Localised
Neogobius melanostomus	Round goby	Fish	No	
Perccottus glenii	Amur sleeper	Fish	No	
Pseudorasbora parva	Topmouth gudgeon; Stone moroko	Fish	No	
Salvelinus fontinalis	Brook trout; Brook charr; Sea trout	Fish	No	
Sander lucioperca	Zander; Pikeperch	Fish	No	
Squalius cephalus	Chub	Fish	Yes	Localised
Thymallus thymallus	Grayling	Fish	No	

Marine

Scientific name	Common name	Taxon Group	Present in Ireland	Note
Caulacanthus okamurae	pom-pom weed	Macroalgae (seaweed)	No	
Celtodoryx ciocalyptoides	sponge	Sponge	No	
Cercopagis pengoi	Fishook waterflea	Crustacean	No	
Didemnum vexillum	Ascidian species	Tunicate	Yes	Localised
Gracilaria vermiculophylla	A red macroalgae (seaweed)	Macroalgae (seaweed)	No	
Hemigrapsus sanguineus	Asian shore crab	Crustacean	No	
Hemigrapsus takanoi	Brush-clawed shore crab	Crustacean	No	
Hesperibalanus fallax	warm-water barnacle	Crustacean	No	
Mnemiopsis leidyi	Warty comb-jelly; Sea Walnut	Ctenophore (a stingless jellyfish-like animal)	No	
Rapana venosa	Veined rapa whelk	Mollusc	No	
Undaria pinnatifida	Wakame; Japanese kelp	Macroalgae (seaweed)	Yes	Localised

Pathogens

Scientific name	Common name	Field characteristics	Reference
Salmon isavirus	Infectious salmon anaemia (ISA) virus	Fish behave lethargically and swim near the surface, often vertically when gasping, and are reluctant to feed. Symptoms include a distended abdomen, protruding bloodshot eyes and pale swollen gills. Symptoms normally develop slowly.	D. Minchin. (2014) *Risk Assessment of non-indigenous aquatic Species, Ireland*. Report undertaken for the Northern Ireland Environment Agency
Aphanomyces astaci	Crayfish plague disease	Many dead or dying White-clawed crayfish *(Austropotamobius pallipes*) – a native species. The dead crayfish may be seen upside-down in the water.	https://invasives.ie/species-alerts/crayfish-plague
Gyrodactylus salaris	Salmon fluke	Specialist knowledge needed. Heavily infected fish normally have damaged fins, in particular the dorsal, caudal and pectorals and there may be copious mucus production. Infested fish are normally lethargic.	D. Minchin. (2014) *Risk Assessment of non-indigenous aquatic Species, Ireland.* Report undertaken for the Northern Ireland Environment Agency
Note: Report suspected cases of these diseases to the Fish Health Unit of the Marine Institute			

Invasive alien species established in Ireland

While these species are more widely established in Ireland, undertaking biosecurity measures are vital to reduce the risk of their spread to new sites. A national alert would not be issued on detection of these species at new sites.

Scientific name	Common name(s)	Environment
Lagarosiphon major	African curly waterweed; Lagarosiphon	Freshwater
Myriophyllum aquaticum	Parrott's feather	Freshwater
Elodea nuttallii	Nuttall's waterweed	Freshwater
Crassula helmsii	New Zealand pigmyweed	Freshwater
Lysichiton americanus	American skunk cabbage	Riparian
Gunnera tinctoria	Giant rhubarb; Chilean rhubarb	Riparian
Impatiens glandulifera	Himalayan balsam; Indian balsam	Riparian
Fallopia japonica; Fallopia x bohemica; Fallopia sachalinensis; Persicaria wallichii	Japanese knotweed and other invasive knotweeds	Riparian
Sargassum muticum	Japanese wireweed	Marine
Styela clava	Leathery Sea Squirt	Marine

The listing of these species as priority concern alert species is due to them being assessed and ranked at high risk of being invasive should they arrive and establish in Ireland[23].

[23] Source references include: Lucy, F. et al. (2020) Horizon scan of invasive alien species for the island of Ireland. Management of Biological Invasions 11(2): 155–177, https://doi.org/10.3391/mbi.2020.11.2.01
D. Minchin. (2007) Rapid coastal survey for targeted alien species associated with floating pontoons in Ireland. Aquatic Invasions Volume 2, Issue 1: 63-70
D. Minchin. (2014) Risk Assessment of non-indigenous aquatic Species, Ireland. 10 December 2014. Report undertaken for the NIEA by D. Minchin.
Kelly, J., O'Flynn, C., and Maguire, C. 2013. Risk analysis and prioritisation for invasive and non-native species in Ireland and Northern Ireland. A report prepared for the NIEA and the NPWS as part of Invasive Species Ireland.
Roy, H. et al. (2014) Horizon scanning for invasive alien species with the potential to threaten biodiversity in Great Britain. Global Change Biology 20: 3859–3871, https://doi.org/10.1111/gcb.12603
WFD UK Tag. Classification of aquatic alien species according to their level of impact. Working Paper Version: 8 (29/01/2021)

The listing of these priority concern alert species may change if the threat status of listed or unlisted species changes or on review of the list by the Aquatic Invasive Alien Species and Biosecurity Technical Advisory Group. An up-dated version of the list will be maintained on the National Biodiversity Data Centre's invasive species website: https://invasives.ie/biosecurity/pathway-action-plans/

Some of the species listed in this section plus many more are regulated under European and domestic regulations for prohibition on introduction, keeping and dispersal. For more information and to view the lists of regulated species visit: https://invasives.ie/about/irelands-invasive-species/.

Reporting sightings of invasive alien species

Report suspected sightings of invasive alien species to the National Biodiversity Data Centre through the Biodiversity Data Capture app (available on ios and android) or through the online recording form: https://records.biodiversityireland.ie/record/invasives

Provide a photograph, if possible, to aid verification of the species identity.

Appendix IV – Check Clean Dry biosecurity campaign awareness resources

Contaminated fishing gear, boats and equipment can cause the spread of invasive species to new water bodies. Invasive plants and animals can be small and hard to spot, and they can survive for weeks on damp gear and equipment. Anglers and other water users can help protect the environment and sport they enjoy by remembering to Check, Clean and Dry their angling gear, boats and equipment when moving between waterbodies. A range of biosecurity awareness raising materials are freely available to you and your club, outlining the key steps to take to reduce the risk of spreading invasive species.

6-panel leaflet

You can download these free materials for your club or event to protect our environments and to be a part of the Check, Clean, Dry campaign from https://invasives.ie/biosecurity/check-clean-dry/. Some of the materials are included here. If you require high quality print ready versions of any of the materials, please e-mail the National Biodiversity Data Centre: invasives@biodiversityireland.ie

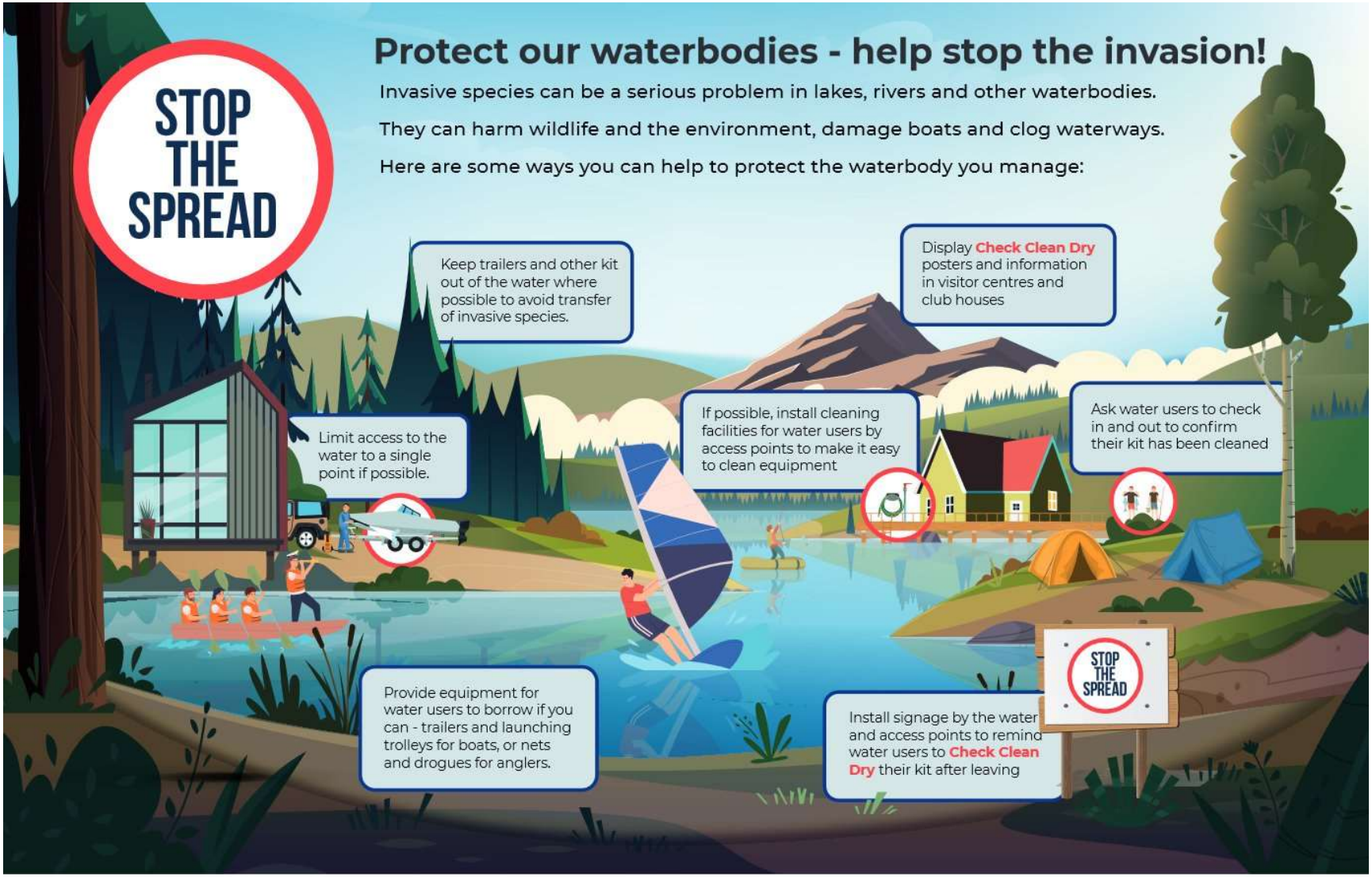
Regarding Action 4 - Check Clean Dry logo with web link for display with licences/permits

STOP THE SPREAD OF INVASIVE PLANTS AND ANIMALS
CHECK
CLEAN
DRY
invasives.ie/biosecurity

Regarding Actions 8 and 9 - Biosecurity signage

Outdoor sign and poster available to download in English and Irish language

Sign/poster for Water Site Manager



General angling biosecurity awareness poster. Versions of this are also available for coarse or game anglers

Templates are available to show your support of the aquatic biosecurity Check Clean Dry campaign by adding your own organisation name and displaying as a poster or sign in your area.

General Angling Template

Game Angling Template

Coarse Angling Template

Thank You – Anglers Sign

Thank You – Coarse Anglers Sign

Thank You – Game Angling Sign

For information on **Ireland's Invasive Alien Species Angling Pathway Action Plan 2022 – 2027** contact:

National Parks and Wildlife Service

Biodiversity Policy, 90 North King Street, Dublin 7, Ireland

E-mail: natureconservation@housing.gov.ie

Phone: +353 (0)1 8883200

Or

National Biodiversity Data Centre

Carriganore, Waterford, Ireland

E-mail: invasives@biodiversityireland.ie

Phone: +353 (0)51 306240

National Biodiversity Data Centre
A Heritage Council Programme

An Roinn Tithíochta, Rialtais Áitiúil agus Oidhreachta
Department of Housing, Local Government and Heritage