

Invasive Non-Native Species Pathway Action Plan: Shore-based Fishing in Wales



May 2026

Lucinda Lintott, Tom Hill, Dr Kate Dey & Dr Paul Stebbing

With contributions from Holly Peek, Chloe Powell Jennings and Jo-Hannah Rees

APEM Ltd. And Natural Resources Wales

This project was delivered by APEM and NRW and funded through the Welsh Government's Nature Networks Programme, to strengthen the resilience of Wales's protected land and marine sites.

Table of Contents

List of Figures	4
List of Tables	4
Crynodeb Gweithredol	5
Executive Summary	7
Background	8
What are Invasive Non-Native Species (INNS)?	8
What are pathways?.....	9
What is biosecurity?.....	12
A biosecurity framework: what is the context for this Pathway Action Plan?.....	12
Scope, aims and objectives	15
The shore-based fishing pathway	16
How do INNS impact shore-based fishing?	17
Relevant INNS for shore-based fishing	18
INNS, Pathways and the Law	29
Biosecurity to Manage the Shore-based Fishing Pathway	30
Who are the key stakeholders?	30
Existing biosecurity for shore-based fishing.....	31
Recommended strategic actions for authorities	33
Recommended actions for all stakeholders	37
1. Understanding roles and legal responsibilities.....	38
2. Information and guidance on INNS and biosecurity.....	40
3. Raising awareness.....	43
4. Biosecurity processes and procedures.....	47
5. Biosecurity facilities	50
6. Monitoring and reporting.....	53
7. Collaborative working.....	57
Action scaling: recreational sea angling club example	59
Useful resources	60

List of Figures

Figure 1. An overview of the Pathway Action Plans that have been developed for Wales, and the vectors associated with the pathways. Note that the list of vectors is not exhaustive.	11
Figure 2. A flowchart showing the relationships between the Pathway Action Plans, Species Action Plans and the Biosecurity Action Plans created for the Natural Resources Wales Biosecurity Planning Project with APEM Ltd.	14
Figure 3. Locations on equipment for angling where INNS may stowaway. Source: GB NNSS (Anglers » NNSS)	16
Figure 4. An extract from the Check, Clean, Dry guidance for marine angling, (Marine angling poster). GB NNSS	31

List of Tables

Table 1. High and Medium risk INNS established in Wales that are likely to spread via shore-based fishing.....	19
Table 2. Examples INNS that are not currently recorded as present in Wales (horizon species) but are likely to spread via and/or impact shore-based fishing.....	27
Table 3. Recommended strategic actions for authorities to address the introduction and spread of marine INNS via all pathways in Wales. The ID letters PS (Pathway Strategic) denote that the actions are aimed at addressing the management of pathways, differing from the ID letters SS (Species Strategic) in the Species Action Plans (SAPs) that are aimed at addressing the management of species.....	33
Table 4. Example actions for a recreational sea angling club.....	59

Crynodeb Gweithredol

- Mae [rhywogaethau estron goresgynnol](#) yn rhywogaethau o blanhigion, anifeiliaid neu bathogenau nad ydynt i'w cael yn naturiol mewn ardal ond sydd wedi cael eu symud yno, gan weithgareddau dynol (naill ai'n ddamweiniol neu'n fwriadol) ac sy'n achosi effeithiau amgylcheddol, cymdeithasol neu economaidd sylweddol. Rhai o effeithiau rhywogaethau estron goresgynnol yw eu bod yn cystadlu'n llwyddiannus â rhywogaethau brodorol am fwyd a gofod, eu bod yn newid cynefinoedd, lledaenu clefydau ac achosi costau uniongyrchol ac anuniongyrchol i economïau lleol a chenedlaethol.
- Mae symudiad (h.y. cyflwyno a lledaenu) rhywogaethau estron goresgynnol yn cael ei hwyluso gan drywyddau a gweithgareddau dynol o'r enw "[Llwybrau](#)", er enghraifft, morgludo, defnyddio cychod hamdden a dyframaethu.
- Mae pysgota o'r lan yn cael ei gydnabod fel un o'r llwybrau ble caiff rhywogaethau estron goresgynnol eu cyflwyno a'u lledaenu, gyda photensial i weithgareddau pysgota symud anifeiliaid (ar ffurf wyau, larfâu, anifeiliaid ifanc ac oedolion) a gwymon (fel darnau neu sborau).
- Gall rhywogaethau estron goresgynnol gael eu cyflwyno a'u lledaenu trwy gael eu maglu neu lynu wrth offer, cyfarpar pysgota, dillad a deunyddiau amsugol fel rhwydi a phan gânt eu defnyddio fel abwyd.
- Fel arfer ceisir mynd i'r afael â lleihau effaith rhywogaethau estron goresgynnol drwy gyfrwng ymdrechion i atal eu lledaeniad ar lefel y 'llwybr'.
- Mae deddfwriaeth a pholisi yn ymwneud â chyflwyno a lledaenu rhywogaethau estron goresgynnol yn bodoli yng Nghymru.
- Mae amcanion y Cynllun Gweithredu Llwybr (PAP) hwn fel a ganlyn:
 - Amlinellu'r risgiau o ran bioddiogelwch sy'n gysylltiedig â physgota masnachol a hamdden o'r lan.
 - Nodi rhywogaethau estron goresgynnol morol allweddol sy'n gysylltiedig â'r llwybr pysgota o'r lan.
 - Darparu cyfres o [gampau gweithredu graddadwy](#) i randdeiliaid amgylchedd morol Cymru y gellid eu rhoi ar waith ble mae pysgota o'r lan yn digwydd.
- Rhanddeiliaid yw'r rhai sy'n defnyddio, yn elwa o, neu sy'n gyfrifol am (e.e. rheoli, amddiffyn neu reoleiddio) yr amgylchedd morol. Yma, mae hyn yn cynnwys awdurdodau perthnasol a chyrff statudol, busnesau a rheolwyr safleoedd, a'r rhai sy'n ymwneud â'r gweithrediadau pysgota o'r lan a restrir isod.
- Y bwriad yw y bydd y PAP hwn yn berthnasol i weithgareddau pysgota morol a gynhelir o'r lan ar hyd a lled Cymru (e.e. traethau, ewyn y don, pierau, harbyrau, morgloddiau) at ddibenion masnachol a hamdden. Gall gweithgareddau o'r fath gynnwys, ond nid ydynt yn gyfyngedig i:
 - Pysgota â gwialen a lein (gan gynnwys castio o'r traeth ac o ewyn y don);
 - Pysgota â lein law;
 - Pysgota â rhwyd;
 - Pysgota â thrap;
 - Casglu â llaw; a
 - Cribinio (gan gynnwys i gynaeafu cocos â thrwydded).

- Nid yw'r ddogfen hon yn berthnasol i weithgareddau pysgota sy'n gofyn defnyddio cwch (gweler y PAP pysgota o gwch ar wefan [Moroedd Gwyllt Cymru](#)).
- Mae'r PAP hwn yn amlinellu saith cydran ffocws bioddiogelwch ar gyfer y llwybr pysgota o'r lan o fewn ardaloedd morol Cymru:
 1. [Deall rolau a chyfrifoldebau cyfreithiol](#)
 2. [Hyrwyddo gwybodaeth ac arweiniad ar rywogaethau estron goresgynnol a bioddiogelwch](#)
 3. [Codi ymwybyddiaeth](#)
 4. [Prosesau a gweithdrefnau bioddiogelwch](#)
 5. [Cyfleusterau bioddiogelwch](#)
 6. [Gwyliadwriaeth ac adrodd](#)
 7. [Gweithio ar y cyd](#)
- Y bwriad yw i'r cynllun hwn gael ei ddefnyddio i gefnogi'r [Cynlluniau Gweithredu Rhywogaethau \(SAP\)](#) a'r [Cynlluniau Gweithredu Bioddiogelwch \(BAP\)](#) cysylltiedig.

Executive Summary

- [Invasive non-native species](#) (INNS) are plants, animals or pathogens that do not naturally occur in an area but have been moved there, by human activities (either accidentally or deliberately) and cause significant environmental, social or economic impacts. The impacts of INNS include outcompeting native species for food and space, altering habitats, spreading disease and incurring direct and indirect costs for local and national economies.
- The movement (i.e., the introduction and spread) of INNS is facilitated by human mediated routes and activities called “[Pathways](#)”, for example, shipping, recreational boating and fishing.
- Shore-based fishing is recognised as a pathway for the introduction and spread of INNS, with potential for fishing activity to move both animals (as eggs and in their larval, juvenile and adult life stages) and seaweed (as fragments or spores).
- INNS can be introduced and spread through being entangled/ attached to equipment, fishing gear, clothing and absorbent materials such as nets and through the use of INNS as bait.
- Reducing the impact of INNS is commonly approached through efforts to prevent their spread at the pathway level.
- Legislation and policy related to the introduction and spread of INNS exists in Wales.
- The objectives of this Pathway Action Plan (PAP) are to:
 - Outline the INNS biosecurity risks associated with commercial and recreational shore-based fishing.
 - Identify key marine INNS associated with the shore-based fishing pathway.
 - Provide stakeholders of the Welsh marine environment with a [series of scalable actions](#) that could be implemented where shore-based fishing occurs.
- Stakeholders are those that use, benefit from or are responsible for (e.g. managing, protecting or regulating) the marine environment. Here, this includes relevant authorities and statutory bodies, businesses and site managers, and those involved in the shore-based fishing activities listed below.
- This PAP is intended to be applicable to marine fishing activities undertaken from the shore across Wales (e.g. beaches, surf, piers, harbours, breakwaters) for both commercial and recreational purposes. Such activities may include, but are not limited to:
 - Rod and line angling (including beach-casting and surfcasting);
 - Handline fishing;
 - Netting;
 - Trapping;
 - Hand-gathering; and
 - Raking (including for licensed cockle harvesting).
- This document does not apply to fishing activities that require the use of a boat (see boat-based fishing PAP on the [Wild Seas Wales website](#)).
- The PAP outlines seven components of biosecurity focus for the shore-based fishing pathway within Welsh marine areas.
 1. [Understanding roles and legal responsibilities](#)
 2. [Information and guidance on INNS and biosecurity](#)

3. [Raising awareness](#)
4. [Biosecurity processes and procedures](#)
5. [Biosecurity facilities](#)
6. [Monitoring and reporting](#)
7. [Collaborative working](#)

- This PAP is intended to be used in support of the associated [Species Action Plans \(SAPs\)](#), and [Biosecurity Action Plans \(BAPs\)](#).

Preface

Safeguarding Wales's marine environment and native biodiversity requires robust biosecurity measures to prevent the spread and impact of invasive non-native species (INNS). The guidance in this Pathway Action Plan outlines actions and guidance to support stakeholders with their biosecurity efforts, with the aim of making Welsh marine shore-based fishing more sustainable.

It is acknowledged that no single activity is solely responsible for the spread of INNS and all users of the marine environment are encouraged to take the time to understand more about this threat and how they can contribute to tackling it.

Stakeholders are encouraged to share this plan, the guidance within it, the actions that they choose to undertake and to raise awareness of biosecurity. Collective effort is ideal, but individual actions are equally vital. Proactive steps by stakeholders, even when taken independently, strengthen national INNS biosecurity and help to protect our marine environment — every action counts.

The significance of this issue is recognised by Natural Resources Wales, who commissioned, and will manage this plan under a [wider framework of INNS biosecurity planning](#).

Background

What are Invasive Non-Native Species (INNS)?

Non-native species (NNS) are plants, animals or pathogens that do not naturally occur in an area but have been moved there, by human activities (either accidentally or deliberately). NNS are also sometimes referred to as “alien species”, “non-indigenous species” or “exotic species”. Most NNS do not cause issues within the area where they have been introduced. However, 10-12% cause significant environmental, social or economic impacts. These are known as Invasive Non-Native Species (INNS) and, in Wales, include the American slipper limpet, carpet sea squirt and Japanese wireweed, among many others. The impacts of INNS include threats to biodiversity, habitat alteration, fouling underwater structures (including navigational aids and piers) and the introduction of diseases. The impacts of INNS (in all

environments including marine) are estimated to cost the British economy £4 billion per year, of which, £499 million per year is attributed to impacts in Wales (see the [2023 Eschen paper](#)).

Marine INNS are resilient and often capable of surviving harsh and variable conditions, making them particularly challenging to manage. Many species can endure high levels of drying, temperature fluctuations, and low nutrient availability, allowing them to persist in damp conditions for extended periods. For instance, mussels, barnacles and algae can remain viable (i.e., still able to live and/or reproduce) when attached to damp equipment, nets or boat hulls, even after days or weeks out of the water. The resilience enables them to travel long distances, hitchhiking on fishing gear, recreational boats, or clothing/equipment.

What are pathways?

The mechanisms and routes by which INNS are moved from one location to another by humans are termed “pathways”. This movement of species by humans, accidentally or deliberately, allows INNS to overcome natural barriers that would otherwise prevent them from spreading between their native and non-native ranges, e.g., an ocean. For instance, Pacific oysters, native to Japan, would not be able to reach UK waters through natural spread, but when introduced into UK waters by human activity can survive and establish as the environmental conditions in the UK are compatible with their native range.

Animals can be moved as eggs and in their larval, juvenile and adult life stages. Seaweed can be moved as fragments or spores (their reproductive structures). Larvae can be planktonic (drift with currents, unable to propel themselves against water movement) or free-swimming (can actively move and maintain their position in the water column).

Pathways are broadly classified as two types:

- 1) Pathways of initial introduction: Those which transfer NNS to regions or locations that are geographically separate and isolated from their native range (referred to as “introduction(s)” in this document). An example of this would be the movement of transoceanic vessels.
- 2) Pathways of further spread: These facilitate the movement of NNS populations beyond their initial introduction point to a wider area (referred to as “spread” in this document):
 - a. Facilitating the short-range dispersal of an NNS population within a single habitat or location (e.g. paddle boarders spreading a seaweed within a bay), or
 - b. Facilitating regional spread where some small barriers exist (e.g., the movement of recreational boats between two nearby but separate harbours).

The frequency and magnitude of pathways in the marine environment have been increasing since the 1800s with the beginning of rapid globalisation. A significant movement of marine INNS has been through the transoceanic voyages and shipping that has long supported growing global economies and international supply chains. For more information on other pathways in the marine environment, please see the other Welsh Pathway Action Plans. Links can be found on the [Wild Seas Wales website](#).

Vectors are the specific, discrete parts of a pathway (i.e. the means within a pathway) that facilitate the movement of INNS from one location to another. Vectors within the shore-based fishing pathway could include INNS becoming attached or entangled in equipment and transferred between locations, or live INNS being used as bait and released. For boating pathways, vectors could include INNS fouling the boat hull or INNS being taken up in water-retaining features (e.g., bilge or ballast tanks). The relationship between pathways and vectors in the marine environment is illustrated in Figure 1.

Natural spread of INNS e.g., larvae distributed along a coastline by tides and currents, may also occur following introductions. However, unlike the spread caused by human activities, natural spread is generally limited by the inherent barriers between locations. Natural spread is generally gradual and organic (i.e. slow outward spread from a point-source of introduction). Although natural spread is more challenging to manage, improved biosecurity procedures, particularly at high-risk/vulnerable sites, can reduce the risk of impact and improve the chances that introductions are detected early.

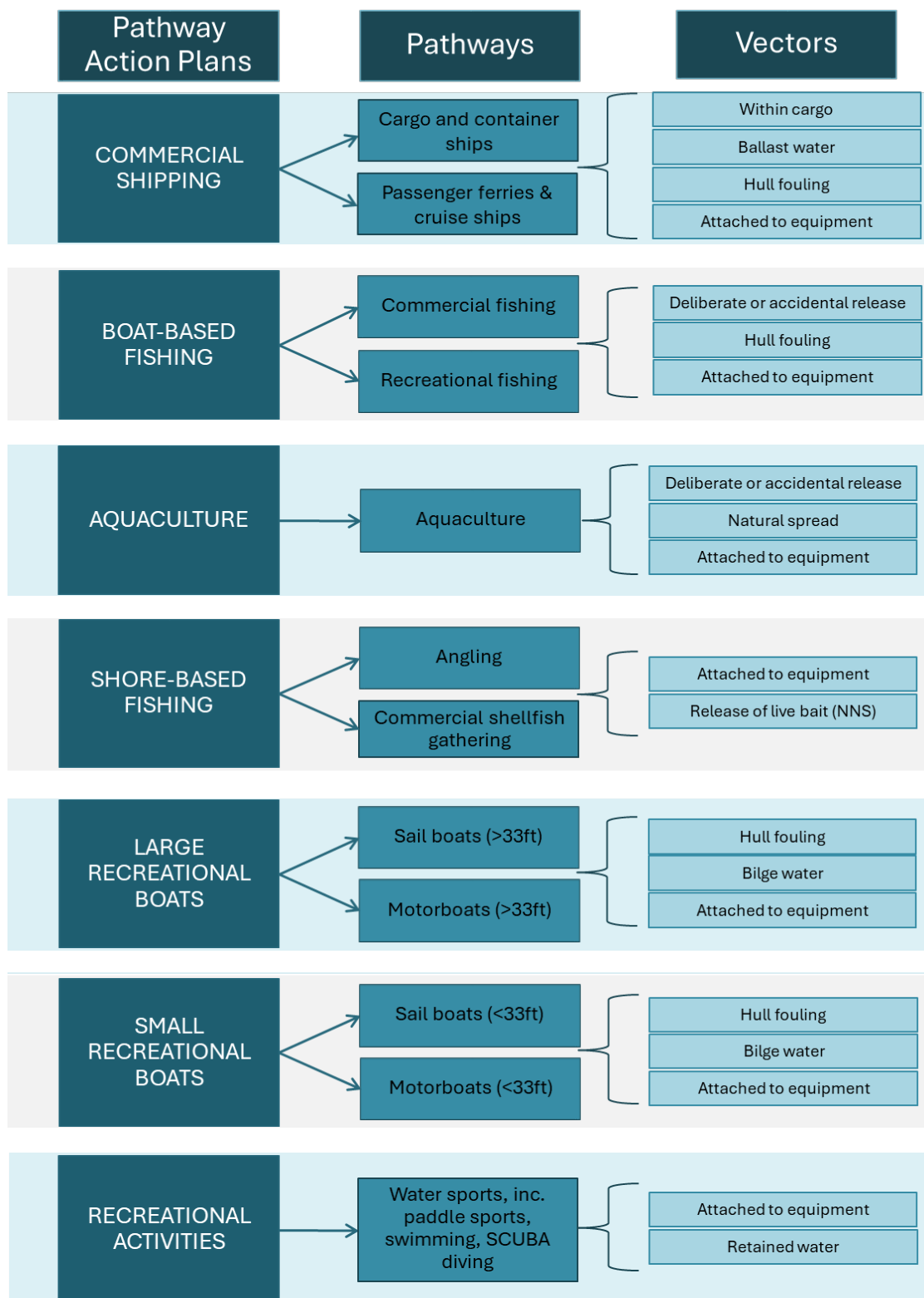


Figure 1. An overview of the Pathway Action Plans that have been developed for Wales, and the vectors associated with the pathways. Note that the list of vectors is not exhaustive.

What is biosecurity?

Biosecurity measures are actions, procedures and behaviours put in place to reduce the risk of INNS introduction and spread into, within and outside of a given area. Biosecurity measures should be realistic, pragmatic and cost-effective. Preventing the introduction and spread of INNS is by far the most effective way to reduce the impact of INNS. Eradication and control of INNS is often not possible in the marine environment and any attempts are more costly, difficult, and time-consuming compared to preventing the arrival and establishment of INNS in the first place. This is especially true in the marine environment, where eradication is near impossible once INNS become established.

A biosecurity framework: what is the context for this Pathway Action Plan?

This Pathway Action Plan forms part of a biosecurity planning framework commissioned and endorsed by Natural Resources Wales. The driver behind the framework is the wider goal of improving the condition of and increasing biodiversity in protected marine sites. Within the marine environment, this goal includes reducing the introduction and spread of INNS. The Species Action Plans (SAPs) and the Pathway Action Plans (PAPs) produced for this framework are intended to provide a basis for biosecurity planning for all marine sites throughout Wales, as well as presenting standalone guidance for pathway management. Figure 2 shows the relationships between each of the action plans.

Pathway Action Plans (PAPs) describe the pathway and list possible actions that could be undertaken to address the risk of the introduction and spread of INNS via that pathway into or around Wales. Links to the other PAPs can be found on the [Wild Seas Wales website](#).

Species Action Plans (SAPs) describe priority INNS and list all possible actions that could be undertaken to address the introduction and spread of that species into or around Wales. Links to the SAPs can be found on the [Wild Seas Wales website](#).

Biosecurity Action Plans (BAPs) are site-specific and can be scaled as appropriate. A BAP can be produced for a whole region (i.e. as has been done for the Pembrokeshire Marine, Cardigan Bay, Menai Strait and Conwy Bay and Carmarthen Bay and Estuaries Special Areas of Conservation (SACs)) or for an individual port, harbour or aquaculture site. They will identify the pathways relevant for that site and the species at or near the site that are of concern. The actions listed in the PAPs and SAPs are relevant to all stakeholders (see [Key stakeholders](#)) and should be considered and incorporated into a site's BAP. Due to the wide breadth and scale of the different stakeholder groups, the scope of these actions is equally broad. It is therefore important that individual stakeholders review their activities and use of the site to decide which of the biosecurity actions are applicable and practicable.

Biosecurity To-Do-List trackers: have been created to make it easier for stakeholders to log what actions they plan to carry out and track what progress is being made on each action. The need for using to-do-list trackers will be dependent on the scope and scale of the BAP. For example, the BAPs produced for the Welsh SACs cover such large areas that it is necessary to provide individual stakeholders with an additional support tool that makes it easier to log and

track their actions. The tracker also enables NRW, as the SAC BAP manager, to effectively oversee the implementation of biosecurity within each SAC, highlighting progress and pinpointing where further assistance or support may be needed. This approach is also intended to facilitate coordinated monitoring and collaborative efforts to share and enhance biosecurity practices between stakeholders. Biosecurity planning at smaller scales (e.g. an individual marina) are unlikely to require a BAP and a to-do-list tracker in parallel. Stakeholders can decide which is the most appropriate method for facilitating their biosecurity efforts. It is worth acknowledging that statutory authorities, including NRW, will also be progressing actions under this framework.

We encourage stakeholders to consider the benefits of improved biosecurity to both the sustainability and profitability of the industry.

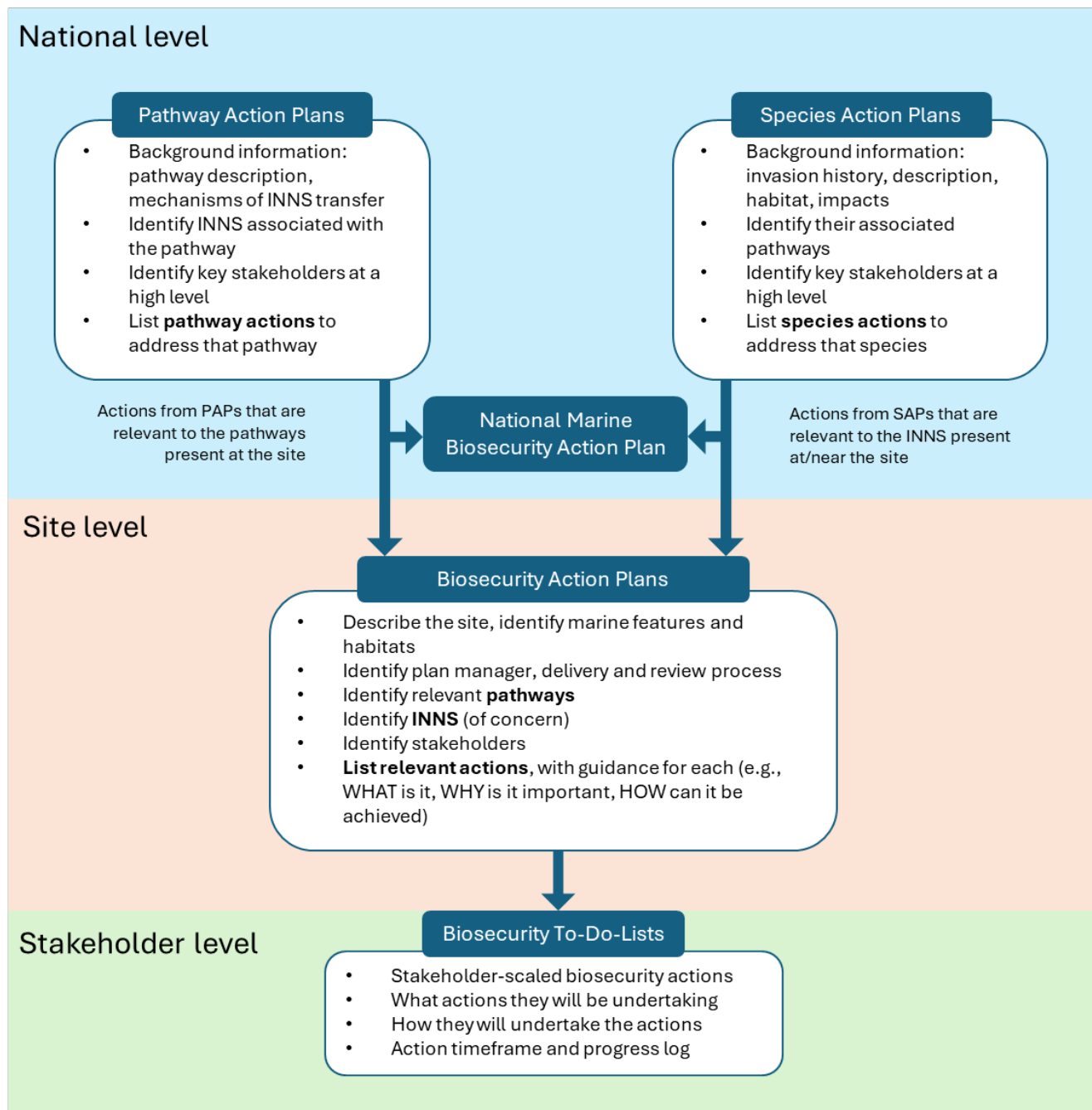


Figure 2. A flowchart showing the relationships between the Pathway Action Plans, Species Action Plans and the Biosecurity Action Plans created for the Natural Resources Wales Biosecurity Planning Project with APEM Ltd.

Scope, aims and objectives

Scope

This Pathway Action Plan (PAP) is intended to be applicable to marine fishing activities undertaken from the shore across Wales for both commercial and recreational purposes. Here, the term ‘shore-based’ applies to fishing activities that take place from the shore, beaches, surf, piers, harbours, breakwaters and any other coastal areas and land-based structures. Such activities may include, but are not limited to:

- Rod and line angling (including beach-casting and surf-casting)
- Longlining
- Using nets to trap target species
- Trapping (submerged devices used to trap and contain fish, crustaceans, shellfish etc, often with the use of bait)
- Hand-gathering and raking (including for bait collection and licensed cockle harvesting)

Although some overlap is expected, this document does not apply to fishing activities that require the use of a boat (see boat-based fishing PAP in [Useful resources](#)).

This document, and the biosecurity measures outlined within it, are intended to be applicable to individual users, clubs, businesses and regulators. This includes land owners and managers where shore-based fishing takes place, tackle and bait shop owners and managers and, to an extent, managers of marinas and harbours in which fishing occurs (see [Key stakeholders](#) for more information). The actions encompass several dimensions of INNS management for the pathway including:

- Strategies for effective biosecurity
- Strategies to enable early detection and quick reaction to new records
- Coordination of efforts, resource sharing and collaboration
- Research, development and innovation
- National policy and regulatory frameworks.

Aim

The overall aim of this PAP is to reduce the risk of the introduction and spread of marine INNS via shore-based fishing activities.

This document aims to complement the existing national work on biosecurity and the shore-based fishing pathway (for further information see [existing biosecurity](#)) providing fishing specific information to aid a pathway-based approach to biosecurity. It also seeks to put forward actions that can be applied at national (Welsh), regional and local levels. The goal is to use existing communications and resources wherever available and adapt them to fit specific requirements. This approach aims to avoid any duplication or unnecessary additional effort. This will facilitate a consistent approach to biosecurity for this pathway across Wales.

Objectives

- Outline the biosecurity risks associated with shore-based fishing.
- Identify marine INNS associated with the shore-based fishing pathway.
- Provide a [list of clear and practical biosecurity actions to address the pathway](#). These can subsequently be scaled, as appropriate, and applied to a specific site and its stakeholders.

The shore-based fishing pathway

Shore-based fishing is recognised as a potential pathway for INNS introduction and spread. It can be attributed to the movement of both animals (as eggs and in their larval, juvenile and adult life stages) and seaweed (as fragments or spores). There are several vectors by which INNS can be spread via shore-based fishing. These include:

- INNS becoming entangled/attached to equipment and clothing (see Figure 3).
- Fishing gear (rod, lines, nets and rakes) and clothing (e.g., waders and boots) can become covered in INNS when immersed in water.
- Absorbent materials such as nets, clothing and personal protective equipment (PPE) can transfer tiny larvae, eggs and spores (e.g., hitchhikers on PPE and vehicles) which can remain viable for days/weeks in damp conditions.
- INNS growing on immersed stationary fishing gear (e.g., traps).



Figure 3. Locations on equipment for angling where INNS may stowaway. Source: GB NNSS ([Anglers » NNSS](#))

- INNS can be transferred between locations, especially when multiple fishing grounds are visited within the same few days or weeks. Additionally, the use of live INNS (or live/dead INNS carrying eggs) as bait can carry a potential risk of viable organisms being introduced into new areas. If live INNS, such as the American slipper limpet (*Crepidula fornicata*), are used as fishing bait, there is the risk of their escape/release, or, if bait has only been recently killed, any eggs that it may be carrying could be released. Organisms can also be spread in or on the packing materials transported with bait, for example, INNS can be attached to seaweed or in mud, making them difficult to spot.

How do INNS impact shore-based fishing?

INNS can cause a problem for shore-based fishing activities. The impacts of INNS can be extensive and varied and include the following:

- **Competition for resources:** INNS can compete for space and food with native species, resulting in declining health and fatalities. This can lead to decreases in the abundance of native fish, shellfish (including cockles) and bait worms.
- **Disease implications:** Less obvious impacts of INNS include the spread of disease to native species. An example of this is the introduced American lobster (*Homarus americanus*) that can carry a bacteria that causes red tail disease (also known as Gaffkaemia). This disease particularly affects the native European lobster (*Homarus gammarus*) and can result in significant rates of death.
- **Habitat alterations:** INNS can alter habitats in ways that make them unsuitable for the survival of native species. For example, the carpet sea squirt (*Didemnum vexillum*) can smother gravel beds used by fish species such as Atlantic herring (*Clupea harengus*) to spawn, which may inhibit egg laying and ultimately reduce adult numbers.
- **Impede fishing activities:** INNS may impede fishing activities by increasing levels of bycatch, becoming entangled in fishing gear (making it less effective and/or more cumbersome) and making fishing areas less accessible. For example, Japanese



Species that can impact shore-based fishing:
Top: Carpet sea squirt (*Didemnum vexillum*) © Spacediver
Bottom: Japanese wireweed (*Sargassum muticum*) © Kit Beard

wireweed (*Sargassum muticum*) can become wrapped around fishing gear and can clog up harbours by forming mass aggregations on the surface. Similarly, Chinese mitten crabs (*Eriocheir sinensis*) are known to take bait from fishing lines, as well as heavily predated on target catch species, which can pose challenges for fishers by disrupting their efforts and reducing their catches.

Relevant INNS for shore-based fishing

The tables below present INNS that are likely to spread via shore-based fishing. Table 1 describes High and Medium risk INNS from the [Welsh Priority Monitoring and Surveillance List](#) (WPMSL) that are known to be present and breeding in Wales. Table 2 describes INNS that are not currently recorded as present in Wales (known as horizon species) but should be monitored for. It is important to identify species that may be on the horizon so that appropriate biosecurity actions can be put in place to prevent their introduction, or surveillance programmes can be implemented to aid timely detection and response. Some species are on the horizon for the UK and some are on the horizon for Wales. These species represent some of the most likely to be transported via shore-based fishing. Note that this is not an exhaustive list, as there are other INNS known to be transported by shore-based fishing that are not listed as High or Medium risk on the WPMSL.

The current distributions of INNS around Wales (and the UK more broadly) can be viewed by searching the database and maps on the [National Biodiversity Network Atlas](#) (NBN Atlas).

An overview of the different lists of INNS that are of interest to Wales can also be found on the [NBN Atlas](#). The current distribution of INNS included on those national lists can be found on the [Wales INNS Portal](#).

Further information and links to resources developed to aid identification of INNS are available below. Further species-specific information is also available from the searchable GB NNSS [Information Portal](#).

Table 1. High and Medium risk INNS established in Wales that are likely to spread via shore-based fishing.

INNS Name	Potential impacts	Image	Additional Information
American slipper limpet (<i>Crepidula fornicata</i>)	Changes in hydrodynamics, and therefore food and oxygen availability; food and space competition with native shellfish (including prevention of spat settlement); reduction of shellfish larvae (via predation); change in local biodiversity.	 Photo credit: Elizabeth Green [CC BY, via iNaturalist].	As a potential bait species anglers should take care to not move this species between locations. Preferably, not use this species as bait at all. Larvae are planktonic for 4-5 weeks (high dispersal risk). Breeding can occur between Feb. and Oct. but peaks in May and June. Spawning seen even at temperatures as low as 7°C. For further information see the GB NNSS Information Portal, Risk Assessment and NBN Atlas A link to the Species Action Plan can be found on the Wild Seas Wales website.

INNS Name	Potential impacts	Image	Additional Information
Carpet sea squirt (<i>Didemnum vexillum</i>)	Major fouling organism on artificial and natural surfaces; potentially decreases local biodiversity due to competition for resources; smothers substrate (including other species) and its acidic surface hinders settlement on it by other species. Costly to other sectors, including the aquaculture industry.	 Photo credit: Javier [CC BY, via iNaturalist]	Fragments may be trapped in gear (e.g., nets); larvae may be in water on fishing gear, other equipment and clothing; can grow on immersed stationary fishing gear (e.g., traps) and equipment (fenders, marker buoys), resulting in its transfer if these objects are moved. Larvae are planktonic for a few hours (low dispersal risk). Fragments are viable for up to 30 days (high dispersal risk). Tolerant to temperatures between -2-24°C and salinities >26ppt. Reproduction occurs between 14-20°C. For further information see the GB NNSS Information Portal, Risk Assessment, NBN Atlas and the 2023 alert poster. A link to the Species Action Plan can be found on the Wild Seas Wales website.

INNS Name	Potential impacts	Image	Additional Information
Chinese mitten crab (<i>Eriocheir sinensis</i>)	Erosion of river / stream banks; affect fisheries by damaging nets, killing netted fish, consuming bait & damaging gear; clog water intake pipes; compete for food & space and predate on native species in freshwater & marine; burrowing activities affect water quality.	 Photo credit: The Food and Environment Research Agency [via GB NNSS]	Adults could be trapped by nets and traps; larvae may be in water on fishing gear, other equipment or clothing; adults may be caught as bycatch and disposed of at a different location to where they were obtained. Reproduction occurs in brackish/marine waters (15-30 ppt salinity). Larvae are planktonic in the marine environment for up to 2 months (high dispersal risk). For further information see the GB NNSS Information Portal, Risk Assessment and NBN Atlas. A link to the Species Action Plan can be found on the Wild Seas Wales website.

INNS Name	Potential impacts	Image	Additional Information
Devil's tongue weed (<i>Grateloupia turuturu</i>)	Outcompetes native algae and seagrasses, leading to changes in local ecosystems. Rapid growth and dense mats can smother other marine life, reducing biodiversity. Alters habitats by changing the structure of the seafloor, which affects the species that rely on these habitats for food and shelter. Can have cascading effects throughout the marine food web. Negatively affect fishing operations by the fouling of nets, ropes, and other equipment. It can also create unfavourable conditions for angling.	 Photo credit: Elena_Sherehora [CC BY, via iNaturalist]	Strands can become tangled in lines, nets and traps; spores may be in water on fishing gear, other equipment and clothing; it can grow on immersed stationary fishing gear (e.g., traps) and equipment (fenders, marker buoys), resulting in its transfer if these objects are moved. Spores can develop at temperatures ranging between 15-20°C. Developed strands have a wide temperature tolerance (4-29°C). For further information see the GB NNS Information Portal and NBN Atlas.

INNS Name	Potential impacts	Image	Additional Information
Japanese Kelp / Wakame (<i>Undaria pinnatifida</i>)	It potentially reduces local biodiversity, by outcompeting and displacing native species. Dense forests of this species can foul fishing gear and equipment. Its dense growth can also affect the availability of space and resources for commercially valuable species.	 Photo credit: Steve Kerr [CC BY, via iNaturalist]	Strands / fronds may be tangled in lines, nets and traps; spores and fragments may be in water on fishing gear, other equipment and clothing, resulting in their transfer if these objects are moved. Fertilisation can occur between 10-15°C with optimum growth for spores between 15-20°C. Spores can survive in temperatures between -1 and 30°C. Spores can be vegetative and remain viable for up to 2 years under certain conditions. For further information, see GB NNSS Information Portal, Risk Assessment and NBN Atlas.

INNS Name	Potential impacts	Image	Additional Information
Japanese skeleton shrimp (<i>Caprella mutica</i>)	Likely to displace other native amphipod species & potentially compete with sessile suspension feeders for food.	 Photo credit: Lucinda Lintott [some rights reserved]	Adults (often < 50 mm) and juveniles attach to other fouling species and artificial substrates; adults and juveniles may be on fishing gear, other equipment and clothing. There is minimal movement of adults, so they are predominantly moved as ‘hitchhikers’. They have a wide temperature tolerance range (-2-28°C) but cannot tolerate low salinities (<18ppt). See GB NNSS Information Portal, Risk Assessment and NBN Atlas.

INNS Name	Potential impacts	Image	Additional Information
Japanese Wireweed (<i>Sargassum muticum</i>)	Can interfere with recreational & commercial use of waterways, especially when detached & forming large floating masses; known for fouling fishing gear & boat props; known to alter habitats; impacts to subtidal native assemblages through overgrowing & shading underlying species, with particular concern for seagrasses.	 Photo credit: Susan Marley [CC BY, via iNaturalist]	Strands / fronds may be tangled in lines, nets and traps; spores and fragments may be in water on fishing gear, other equipment and clothing, resulting in their transfer if these objects are moved. Fragments viable for up to 3 months. Wide tolerances of temperature (10-30°C) and salinity (7-34ppt). For further information see the GB NNS Information Portal, Risk Assessment and NBN Atlas.

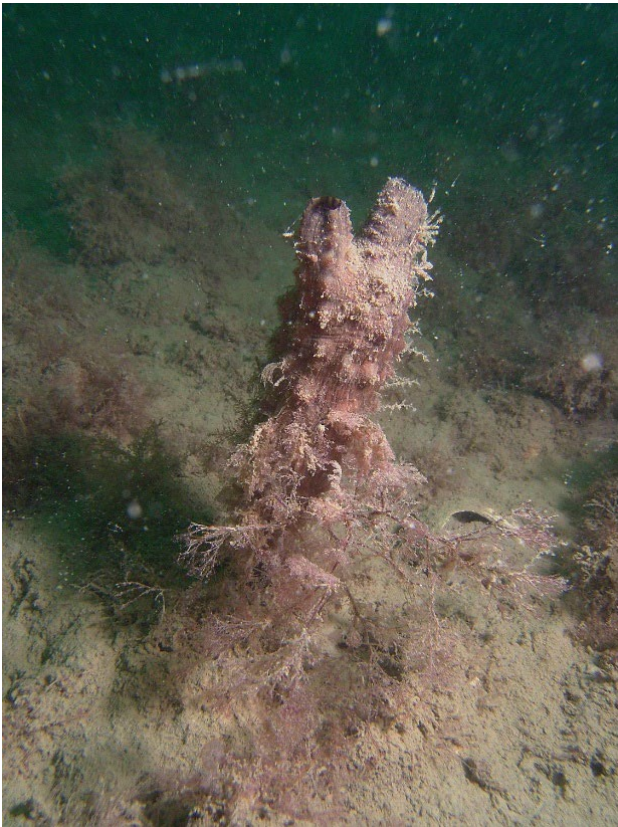
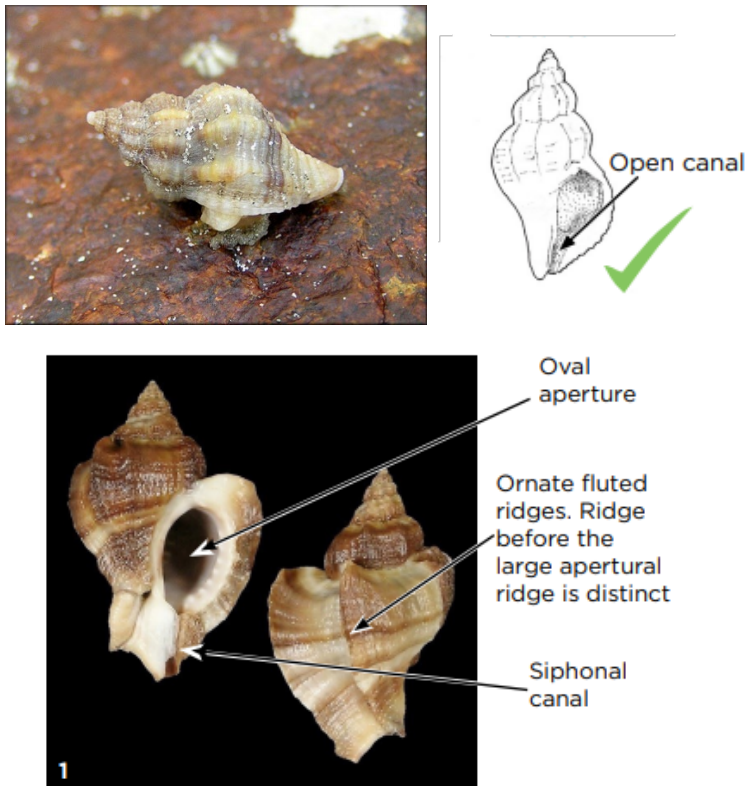
INNS Name	Potential impacts	Image	Additional Information
Leathery sea squirt (<i>Styela clava</i>)	Can be a major fouling organism on boats & fishing equipment & other artificial structures; potentially decreases local biodiversity through outcompeting native species.	 Photo credit: Chris Wood, Marine Conservation Society [via GB NNSS]	Larvae may be in water on fishing gear, other equipment and clothing; adults can grow on immersed stationary fishing gear (e.g., traps) and equipment (fenders, marker buoys), resulting in its transfer if these objects are moved. They are hermaphroditic (possess both male and female reproductive organs) but not self-fertile. Spawning occurs in water above 15°C and larvae are planktonic for 1-3 days before they settle. For further information see the GB NNSS Information Portal and NBN Atlas.

Table 2. Examples INNS that are not currently recorded as present in Wales (horizon species) but are likely to spread via and/or impact shore-based fishing.

Horizon INNS name	Potential impacts	Image	Additional information
HORIZON SPECIES: American and Japanese oyster drills (<i>Urosalpinx cinerea</i> & <i>Ocenebrellus inornatus</i>)	Predator of shellfish including commercially important species, resulting in huge economic loss.	 Top: American oyster drill: Photo credit: Bill Frank [via GB NNSS]. Diagram credit: Guy Baker. Bottom: Japanese oyster drill: Photo credit: G.T. Poppe	They may be transported attached to shellfish (as larvae which emerge from eggs, or small juveniles) which are being translocated for use as bait. No planktonic larval stage for either species so natural spread risk is low. For further information on <i>U. cinerea</i> see the GB NNSS Information Portal, Risk Assessment and NBN Atlas. For further information on <i>O. inornatus</i> see the GB NNSS Information Portal, Risk Assessment and NBN Atlas. A link to the Species Action Plan can be found on the Wild Seas Wales website.

Horizon INNS name	Potential impacts	Image	Additional information
HORIZON SPECIES: Veined rapa whelk (<i>Rapana venosa</i>)	Predator of shellfish including commercially important species, has the potential to decimate bivalve fisheries, with associated economic loss.	 Photo credit: Nikita Gerasin [CC BY, via iNaturalist]	Larvae may be in water that is transported with live bait. Planktonic larval phase of 24-80 days (high dispersal risk). Successful establishment of reproductive populations seen to occur between 18-26°C. For further information, see the GB NNS Information Portal, Risk Assessment and the NBN Atlas.

INNS, Pathways and the Law

The following points provide a brief summary of relevant legislation (at time of writing):

- Pathway management and the development of pathway action plans are specifically mentioned under the [EU Regulation \(1143/2014\)](#) on the prevention and management of the introduction and spread of invasive alien species. This regulation was retained in domestic law under the European Union (withdrawal) Act 2018 as the [Invasive Alien Species \(Enforcement and Permitting\) Order 2019](#).
- [The Wildlife and Countryside Act 1981](#) makes it an offence to release or allow to escape into the wild any plant or animal which is not ordinarily resident in Great Britain (i.e. non-native) and is not a regular visitor to Great Britain in a wild state (i.e. migratory).
- [The Marine Strategy Regulations 2010](#) transpose into domestic law the EU Marine Strategy Framework Directive. The Directive aims to reduce human impacts on the marine environment, including INNS. The programme of measures is intended to reduce the introduction and spread of INNS. INNS pathway management helps to deliver the 2010 Regulations.
- [The Water Environment \(Water Framework Directive\) \(England and Wales\) Regulations 2017](#) transpose into domestic law the EU Water Framework Directive. The Directive establishes a framework for national measures to achieve or maintain a good ecological status, including transitional and coastal waters. While INNS are not specifically mentioned within the 2017 Regulations they could affect the ecological status of waterbodies. Pathway management is a key aspect of managing the potential spread of INNS.
- A [GB Angling PAP](#) was developed by the GB Non-Native Species Secretariat (NNSS) in 2020. While legislation requires the development of the plan there are no legal mechanisms by which the plans can be enforced directly through the Regulations.

A note on specific legislation for shore-based fishing

There is no licence required to fish recreationally for sea fish in the Wales. Permits or permission to fish may be required in certain locations, such as privately owned piers or harbours. Local clubs and tackle shops are a good source of information on where permits are necessary. The [GB Angling PAP](#) outlines the general policy and actions to address the risks that this pathway poses for the introduction and spread of aquatic INNS.

Biosecurity to Manage the Shore-based Fishing Pathway

The following sections present information on existing biosecurity for activities or sites associated with the shore-based fishing pathway as well as actions that, if undertaken, would improve biosecurity in this sector and, ultimately, reduce the risk of INNS impacting shore-based fishing stakeholders.

Who are the key stakeholders?

Within the context of this PAP, a stakeholder is anyone who uses, benefits from or is responsible for (e.g. managing, protecting or regulating) the marine environment

Biosecurity for shore-based fishing requires engagement and actions taken at a national, regional and local scales by specific stakeholders including, but not limited to individuals, businesses, marina and harbour managers (where shore-based fishing takes place), statutory bodies and authorities. To note, the term “authorities” here refers to bodies with powers to introduce, amend and enforce regulations, legislation and policy.

For the successful implementation of the actions recommended in this PAP and across the [biosecurity framework](#), stakeholders must work together to engage, support and secure resources where needed.

Examples of relevant stakeholders include:

Authorities

- Government departments, organisations and agencies (e.g., Welsh Government)
- Regulatory bodies (e.g., Natural Resources Wales)
- County councils and local authorities
- National Park Authorities

National stakeholders

- Managing bodies for protected sites (e.g., National Trust)
- Environmental charities and Non-Governmental Organisations (NGOs) (e.g., the Marine Biological Society and Wildlife Trusts)
- Recreational governing bodies and groups (e.g., Angling Cymru)
- Major landowners (e.g., the Crown Estate)
- GB Non-native Species Secretariat (NNSS) Programme Board
- GB Non-native Species Committee
- Wales Biodiversity Partnership

Local stakeholders

- Local landowners
- Environmental groups
- Local fishing clubs and associations
- Cockle license-holders
- Marina managers and harbour masters (where shore-based fishing occurs)
- Point of sale (e.g., bait and tackle shops, seafood wholesalers)
- Individual anglers, fishers, gatherers, crabbers etc.

Existing biosecurity for shore-based fishing

This PAP and [the wider biosecurity framework](#) (within which this PAP sits) are intended to complement and improve the existing biosecurity actions that might already be being undertaken by shore-based fishers or those operating at sites related to the pathway. The INNS biosecurity recommendations within this, and other, PAPs and BAPs do not override the [GB Angling PAP](#), existing guidance or best-practice activities currently undertaken by the sector. It is important to note that biosecurity to address the shore-based fishing pathway can take a number of forms depending on who is taking the action and the scale of the target area.

Check Clean Dry

The [Check, Clean, Dry](#) (CCD) campaign is a national campaign in the UK to improve aquatic biosecurity by outlining three key steps to preventing the spread of INNS (see Figure 4). A key approach to angling biosecurity is to promote the procedures that ensure that equipment and personal protective equipment (PPE) is cleaned of organisms and completely dried out between uses.



Figure 4. An extract from the Check, Clean, Dry guidance for marine angling, (Marine angling poster). GB NNSS

The GB Angling PAP

[The GB Angling PAP](#) is aimed at the angling pathway for marine, brackish and freshwater environments and outlines the general policy and approaches to addressing the angling pathway in Great Britain. As well as actions to be taken by key stakeholders like the Angling Trust, water companies and governments, the Angling PAP contains a Code of Conduct for recreational angling ([Annex 4](#)) and a biosecurity clause that can be included in angling club constitutions ([Annex 7](#)). Further resources that have been developed for angling can be found in [Useful resources](#).

Site-specific biosecurity planning

Site-specific Biosecurity Action Plans are important tools to help ensure that a thorough approach to biosecurity is taken. The [framework](#) associated with this PAP allows for biosecurity planning to be scaled as deemed appropriate by stakeholders. For instance, a sea-fishing club could fill in a to-do-list-tracker or land managers for sites when shore-based fishing occurs could create a site-specific BAP. A site-specific BAP should include the following elements:

- A summary of the site background and activities (e.g., environmental information, INNS present, site use).
- A broad assessment of the INNS pathways that might be present at the site (i.e., identify the pathways and vectors/determine how INNS might be spread to and from the site).
- Appropriate and proportional biosecurity actions to address the risks identified
 - If there are multiple pathways at the site, consider what other actions there may be to address these risks. These can be found in the other PAPs (see [Useful resources](#)).
- Plan details (e.g., biosecurity manager/responsible staff, review period).

In addition to the biosecurity to-do-list trackers that form part of the biosecurity framework, the following resources may help when planning a site-specific biosecurity plan:

- [Marine Biosecurity Planning \(2015\)](#)
- [Marine Biosecurity Planning – Guidance for Specific Operational/Construction related Activities \(with template\)](#)
- [INNS Management Toolkits](#)

Plans should be regularly evaluated to review the progress, successes, failures and modifications of the actions within it. They should then be updated to reflect these outcomes by, perhaps, amending approaches, altering timescales or allocating additional resources. The plan should also be updated with current information on the distribution of any key INNS or changes to site use. Plan managers should consider discussing their plan with NRW.

Recommended strategic actions for authorities

Table 3 contains a list of possible strategic actions which could be taken by national authorities. Achievement of these actions support a solid statutory basis for robust management of **all marine INNS pathways in Wales, including the shore-based fishing pathway**. However, it is acknowledged that any statutory changes require extensive and time-consuming legislative assessments and consultation which is at odds with the urgency required for pathway and INNS management at present. It is therefore recommended that these strategic actions act as long-term goals for authorities and that priority is placed on actions that can be undertaken and achieved on shorter timescales by all stakeholders (see [Recommended actions for stakeholders](#)).

Table 3. Recommended strategic actions for authorities to address the introduction and spread of marine INNS via all pathways in Wales. The ID letters PS (Pathway Strategic) denote that the actions are aimed at addressing the management of pathways, differing from the ID letters SS (Species Strategic) in the Species Action Plans (SAPs) that are aimed at addressing the management of species.

ID	Strategic action	Purpose
PS-1	Develop a national (Welsh) position statement for key pathways in the marine environment	The statement (and its guidance) should: • Set out the position of the Welsh Government on pathway management and lay out a national approach for addressing key marine INNS pathways. • Provide a clear objective for all marine stakeholders, supported through guidance and assistance where available. Top-down direction is a critical need for the facilitation of national, regional and local biosecurity planning. • Make it clear that improved biosecurity is the priority; however, also include goals in relation to pathway risk, surveillance and monitoring, and INNS early detection, rapid response and management. • Aim to clearly state what is expected of all stakeholders and provide realistic, measurable and agreed targets. The position should conceptually align with other GB strategies and existing regulation to ensure a consistent approach to pathway management throughout the British Isles. However, it must be grounded within a realistic Welsh focus, taking current limitations into account. To achieve the best outcomes, stakeholders should be consulted in policymaking, and policymakers should support the integration of industry expertise and experience into INNS pathways management strategies.

ID	Strategic action	Purpose
PS-2	Review existing legislation	A review should be undertaken of current legislation in Wales and the wider UK relating to INNS pathways, to identify legislative gaps and highlight opportunities to strengthen INNS and biosecurity legislation. The review should identify primary legislation under which INNS management can be enforced (e.g., Wildlife and Countryside Act, 1981). The outcomes of this review could provide evidence, justification, and legislative support for national position statements or for introducing / amending legislation relating to pathways in Wales.
PS-3	Introduce legislation relating to pathways in Wales	The introduction of new legislation (or the amendment of existing legislation) in Wales relating to marine pathways can ensure a consistent and enforceable approach to biosecurity. Authorities should use evidence gathered as part of the review of existing legislation (see PS-2) as justification for new legislation. For example, the adoption of existing international resolutions (e.g., the International Maritime Organisation resolution MEPC.207(62) on biofouling) can facilitate a robust approach to pathway management in line with international standards. Legislation may not be required for, or applicable to all pathways.
PS-4	Review and prioritise resource allocation in support of policy and legislation related to INNS	Enforcement / enactment of existing and new policy and legislation should be considered. Resources, roles and responsibilities should be agreed and assigned to ensure that prioritised policy and legislation is being effectively enacted (e.g., provisions for enforcement officers to carry out inspections). Incentives for following legislation could be outlined in biosecurity-related award schemes or accreditations, which should be investigated, created and/or developed and endorsed by the Welsh Government or Natural Resources Wales. Penalties for offences could include fines or suspension of relevant licences as per The Invasive Alien Species Order 2019. Importantly, legislative policy needs to be clearly communicated to stakeholders.

ID	Strategic action	Purpose
PS-5	Identify and prioritise high risk areas/locations for marine INNS introductions and impacts	Pathway and species risk assessments are a valuable tool for identifying and prioritising high-risk locations for marine INNS and more effectively allocating resources. Data gathered from previous reports (e.g., NRW evidence report 459 and NRW evidence report “Marine Protected Areas: Features at risk from marine invasive non-native species” (pending publication) and information from the SAPs and PAPs in the biosecurity framework should be used to inform strategies for species and pathway management and surveillance. It is recognised that data used to inform pathway and species risk assessments is currently limited and further data collection is required.
PS-6	Develop a national plan for monitoring marine INNS pathways	A national plan should develop a standardised approach to monitoring marine pathways and implementing monitoring programs in high-risk locations (see PS-5). The procedures within this plan should be applicable and practical at local, regional and national levels with provisions included for necessary resources or support required to undertake actions. The plan could be developed in consultation with stakeholders from all levels. A cost-benefit analysis could also be undertaken to ensure that the implementation of inspections will not damage Welsh businesses.
PS-7	Continue to develop contingency plans for key marine INNS	Contingency plans put forward protocols for situations when a new record of an INNS is made in an area it has not been previously recorded. This can include INNS that are new to Wales and INNS that are found in some regions of Wales but not others. The protocol typically involves contacting relevant authorities and taxonomic experts for positive identification, as well as putting in place rapid actions to contain the spread of the new species. General contingency plans for marine INNS have been developed for England by the GB NNSS and a general INNS contingency plan for Wales is in draft (at time of writing, July 2025).

ID	Strategic action	Purpose
PS-8	Improve collaboration and links between stakeholders and authorities	Invite stakeholders to participate in existing platforms and/or forums for ongoing communication, collaboration, and knowledge exchange, such as the British Ecological Society Invasion Science Special Interest Group. Platforms like this serve as a hub where researchers, policymakers, government agencies, industry representatives, and wider stakeholders come together to share expertise, data, and resources related to INNS management. Key features should include: 1. Regular meeting and workshops; 2. Agreements for data sharing and data integration; 3. Collaborative research, leveraging the expertise and experience of the industry; 4. Capacity building; and 5. Research and monitoring priorities communicated between stakeholders. Promote the Natural Resources Wales list of high priority evidence needs and research ideas page: Natural Resources Wales / Marine and coastal evidence priorities.
PS-9	Improve national data flow	Data flow is fragmented, data administration slow, and existing mechanisms for priority species reports reaching authorities are inconsistent, which may delay management response. Different recording schemes have variable verification and data upload timescales as well as variable data restrictions and some records are lost in the data flow process. Authorities should work with partners including The UK Centre For Ecology & Hydrology, The Marine Biological Association, The National Biodiversity Network and Local Environmental Records Centres to ensure records arrive at the appropriate destination in a timely manner and are accessible to all. This may include continuing work with Defra on their ‘improving marine NIS data access and flow efficiency’ project.

Recommended actions for all stakeholders

The sections below outline seven components of biosecurity focus for the shore-based fishing pathway within Welsh marine areas. Stakeholder-specific guidance, including example actions for each component, is provided to support the development of tailored actions. Stakeholders are encouraged to define their own biosecurity actions, appropriately scaled and proportional to their activities, using the guidance provided.

The biosecurity components in this plan complement those outlined in the SAPs and other PAPs. They can serve as a foundation for creating a new biosecurity plan or modifying and enhancing existing procedures. For each component, high-level 'priority issues' have been identified through discussions with stakeholders. These priority issues inform the initial context for developing tailored actions.

These components are:

1. [Understanding roles and legal responsibilities](#)
2. [Information and guidance on INNS and biosecurity](#)
3. [Raising awareness](#)
4. [Biosecurity processes and procedures](#)
5. [Biosecurity facilities](#)
6. [Monitoring and reporting](#)
7. [Collaborative working](#)

1. Understanding roles and legal responsibilities.

To ensure that all stakeholders are aware of the relevant and current INNS legislation and national policy that relate to shore-based fishing.

PRIORITY ISSUE: There is a lack of clarity within stakeholder groups (for all pathways) regarding the legal requirements for INNS management. Stakeholders require more guidance on how their activities intersect with INNS legislation, and what is required under current policy (if anything) to achieve compliance (i.e. voluntary vs. mandatory actions).

Responsible stakeholder	Guidance for Development of Actions	Example actions
Authorities	Authorities should produce a policy position or statement (see actions PS-1 to PS-4), relevant to existing or new INNS-focused legislation and regulation. This policy(s) should provide stakeholders with an improved understanding of how INNS legislation or regulation affects them. This needs to be communicated via an appropriate information cascade to include all relevant stakeholders. If legislation or regulation exists, but enforcement policy is undefined, it is recommended that stakeholders are still offered advice on this matter.	• Consult with relevant stakeholders on the implementation and feasibility of INNS focused policy. • Collaborate with the shore-based fishing sector / stakeholders to develop appropriate and achievable policy, without undue impact to Welsh blue growth and individual operators. • Ensure consistency with wider legislation and regulation. • Establish a policy(s) for relevant regulation(s) and release a statement to provide stakeholders with a clear definition of what is expected under the legislation.

Responsible stakeholder	Guidance for Development of Actions	Example actions
National & local stakeholders	Official statements (as above) should be summarised and shared between relevant stakeholders, using plain, accessible language. Information could be included in association newsletters or governing body communications to relevant stakeholders (e.g., updates from Angling Cymru) so that all stakeholders are aware of any legal responsibilities with regards to INNS. In cases where an authority-produced statement is unavailable, national and local stakeholders are encouraged to independently review the relevant regulation and provide advice to their members as appropriate. Individual users should adhere to the position statement or advice offered by higher-level stakeholders. If unaffiliated, individuals could take it on themselves to understand the relevant legislation and adjust their own practices where practicable.	• Issue a press-release that summarises current national policy, highlighting the requirements for compliance with the legislation or regulation. • Include an overview of the requirements under legislation and policy in public communications to recreational stakeholders (e.g., in harbour information announcements (where fishing takes place), or club codes of practice). • Adhere to relevant legislation and best practice.

2. Information and guidance on INNS and biosecurity

To ensure that information and guidance on INNS and biosecurity within Welsh marine areas are consistent, high-quality and appropriate for the shore-based fishing pathway.

PRIORITY ISSUE 1: Resources for INNS and biosecurity awareness are abundant but can be fragmented, making it difficult for stakeholders to navigate and identify the most relevant and appropriate information, especially without a prior understanding of biosecurity.

PRIORITY ISSUE 2: Targeted, sector-specific (i.e. pathway specific) biosecurity guidance is limited, resulting in stakeholders being unsure of what to do and when to do it.

Responsible stakeholder	Guidance for Development of Actions	Example actions
All stakeholders	This biosecurity component aims to address information resources on INNS for shore-based fishing stakeholders, ensuring that these resources are appropriate for the pathway. However, it should be noted that the provision of INNS information resources is expected to overlap significantly across all marine PAPs, SAPs and BAPs. Therefore, it is critical that authorities, as well as local and national stakeholders, take a holistic approach by integrating and co-ordinating their biosecurity activities. By doing so, they can ensure a cohesive and unified effort that builds on and enhances existing measures, maximising the effectiveness of INNS management across all marine pathways and action plans. Targeted guidance is needed to help integrate proportional, industry-beneficial and focused biosecurity actions into existing practices.	• Download or request a copy of the NRW marine INNS identification guide (see Useful resources). Identification sheets for several marine species can also be found on the GB NNSS website. • Refine guidance to increase relevance for the different end users in the shore-based fishing sector (e.g., individual fishers, commercial cocklers, clubs or marina managers).

Responsible stakeholder	Guidance for Development of Actions	Example actions
All stakeholders continued	Engaging the industry in consultation during policy-making, co-developing best practice advice, and fostering collaborative efforts to raise INNS awareness in Welsh marine areas are essential steps toward achieving balanced and effective biosecurity improvements. All stakeholders should ensure that resources are appropriate, tailoring specific guides to relevant operations and risk factors.	See actions above.
Authorities	To improve INNS biosecurity in Welsh marine areas, authorities should consider creating/aligning a national-level marine INNS and biosecurity awareness raising campaign. This should provide common resources and consistent messaging for all marine stakeholders. Key highlights of the campaign could include: • A centralised location for biosecurity and INNS awareness-raising materials. While there is considerable existing material available for this action, ensuring a common repository and "endorsement" of primary materials will help stakeholders maintain consistency. • A defined list of priority INNS of concern. • Publication of INNS alerts when a population is newly established or spreading. • Clear points of contact for stakeholders seeking support and advice. Authorities could consider leading a consultation with other stakeholders on the production/review of a code of practice, building from the code of conduct in the GB Angling PAP.	• Identification guides, such as the Welsh and English NRW ID guides (see Useful resources), should be printed and disseminated to as many relevant stakeholders as possible (e.g., local groups, aquaculture operations, points of sale). The ID guides should be kept up to date, accounting for newly introduced and horizon INNS. • Create an accessible central website to host biosecurity resources and information to make navigation to the most relevant information easier. • Produce pathway-specific training resources which can be provided to other stakeholders. • Consult with stakeholders on the update / production / endorsement of best practice codes for INNS and biosecurity in shore-based fishing and share widely with relevant stakeholders.

Responsible stakeholder	Guidance for Development of Actions	Example actions
National & Local stakeholders	In the absence/interim of the action above, national stakeholders should consider the INNS information and decide whether it is suitable for / relevant to their operating practices. Relevant information that could be integrated into operation-specific material could include: • Key INNS to look out for • Impacts of INNS • Biosecurity best-practice Material could include self-produced resources; however, a lower effort option could review and compile the existing material already in existence. Sources of existing, high-quality INNS biosecurity information include the GB NNSS and the Angling Trust (see Useful resources for links). Where possible, information material should prioritise increasing knowledge of relevant INNS (to pathway or region) and key biosecurity messages.	• Review existing biosecurity information and tailor to the shore-based fishing pathway.
Marina managers / harbour masters	Could act as a source for the dissemination of the information produced above. Pro-active individual stakeholders or those more commercially focused (i.e. angling retailers) may still choose to seek out and share information independently from the above actions.	• Review the guidance received and incorporate into procedures where possible. • Consult with other stakeholders to ensure that risk factors are considered appropriately within information resources.

3. Raising awareness

To facilitate and encourage the active sharing of information and guidance, relevant to the shore-based fishing pathway, among all stakeholders within Welsh marine areas.

PRIORITY ISSUE: Some stakeholders operating within Welsh marine areas are not aware of INNS and their impacts, or what biosecurity is. All stakeholders would benefit from more exposure to INNS awareness raising activities. All stakeholders could also facilitate the spread of information and awareness raising about INNS and biosecurity.

Responsible stakeholder	Guidance for Development of Actions	Example actions
All stakeholders	This biosecurity component aims to increase the awareness of INNS biosecurity with shore-based fishing stakeholders. The materials produced under Component 2 are intended to provide the consistency and appropriateness of biosecurity information for the pathway. However, it should be noted that raising awareness is expected to overlap significantly across all marine PAPs, SAPs and BAPs. Therefore, it is critical that all stakeholders (including authorities) integrate/coordinate their activities. By doing so, they can ensure a cohesive and unified effort that maximising the effectiveness (and reach) of INNS information-sharing. All stakeholders can have a role in raising awareness of INNS and biosecurity by promoting and disseminating existing information regarding INNS and key biosecurity messages. This could be achieved both digitally (e.g., through social media and relevant websites) and in print (e.g., in tackle shops / point of sale, harbour offices, newsletters and magazines). There is no requirement for burdensome changes to current activities, but consideration of INNS within outwards facing communications or marketing can benefit the sustainability of all activities within Welsh marine areas.	- Engage in Invasive Species Week. Use approved or provided biosecurity resources in communications and training. A marine INNS workshop kit comprised of preserved specimens and information sheets can be borrowed from Amgueddfa Cymru (see Useful resources). - Become familiar with existing and newly developed fishing-focused guidance. - Share information resources with other stakeholders as widely as possible. - Provide ad hoc information/facts on INNS to staff, colleagues, members of the public, customers etc.

Responsible stakeholder	Guidance for Development of Actions	Example actions
All stakeholders continued	The Useful resources within this PAP include links to existing high-quality information sources which can be used as the basis for awareness raising. However, it is hoped that as national awareness increases, fishing stakeholders will expand their knowledge and activities in this area, eventually producing their own tailored resources (where they have not already done so), further amplifying awareness and engagement. Installing signage at popular fishing locations, such as piers and at rocky headlands can facilitate outreach to the wider public. Signage is particularly effective at targeting individual users who may be unaffiliated with other groups such as clubs or bodies and therefore operate outside of other communication channels. Information contained within signage can range from general actions and national guidance (e.g., the GB NNSS Check, Clean, Dry campaign), to site specific biosecurity protocols, depending on the intended audience (see Useful resources for links to signage resources). Landowner permission should be considered (if applicable or required). Individual fishers should simply read and abide by any signage at their local fishing spot. Equipment cleaning guidance (e.g., the GB NNSS Check, Clean, Dry campaign) should be shared by all relevant organisations and staff. For submerged equipment/infrastructure, guidance should include information on cleaning all underwater surfaces (e.g., trestles, pontoons, buoys etc.).	• Install biosecurity signage at prominent locations. • Provide clear instructions for the cleaning of equipment.

Responsible stakeholder	Guidance for Development of Actions	Example actions
All stakeholders continued	Organise workshops and educational events through local groups for shore-based fishers. These could cover an introduction to INNS, and best-practice for cleaning equipment. Training and educational resources are available on the GB NNSS website (GB NNSS Training resources).	See actions above.
Authorities	Authorities should ideally be a primary source for INNS and biosecurity information in Wales. Information on available funding and resources for biosecurity should be shared with stakeholders. Messaging should ensure that stakeholders are aware of critical information, such as updates to policies (e.g. in-water cleaning rules) or species records/alerts.	• Issue regular updates/social media posts offering INNS and biosecurity advice. • Continue to engage with stakeholders, with a particular focus on improving communication links with key shore-based fishing stakeholders. • Include links or QR codes to online resources (including ID guides) with communications. Where appropriate, stock/disseminate hard copies of resources.

Responsible stakeholder	Guidance for Development of Actions	Example actions
National and local stakeholders	Fishing events and competitions can be used as an opportunity to undertake awareness-raising actions, spreading INNS information to a wider audience of participants and members of the public. During high-risk events (e.g., competitions, especially those supporting international participants), a short talk or briefing before each event should be given to explain the importance of biosecurity as well as to remind participants to engage with the site biosecurity. Staff or volunteers could be in attendance to raise awareness of INNS and assist with any biosecurity actions required. Event organisers could link with local NGOs (e.g., Wildlife Trusts) to set up INNS information stands and provide attendees with relevant resources (e.g., biosecurity best-practice guidance and INNS guides) such as angling event guidance created by the GB NNSS. Biosecurity information and requirements should be sent out with any advanced communication, such as event registration. Disqualification from the event (if applicable and possible) should be imposed if biosecurity requirements are intentionally disregarded.	• Incorporate INNS and biosecurity information in pre-event communications and at briefings before events commence. • Include biosecurity statements in event entry conditions / prerequisites for competitions. • Collaborate with NGOs to produce activity specific INNS guidance to use at awareness raising events.

4. Biosecurity processes and procedures

To improve INNS biosecurity procedures being undertaken by stakeholders relevant to the shore-based fishing pathway, ensuring consistency and efficacy.

PRIORITY ISSUE: Stakeholders involved with recreational fishing may already have an understanding of INNS and general biosecurity awareness. However, continuous improvement and the inclusion of best practice in standard procedures should also be considered.

Other stakeholders (such as NRW, local authorities (LAs), and county councils (CC) field or operational teams) should also consider reviewing and updating their own biosecurity procedures on a regular basis.

Responsible stakeholder	Guidance for Development of Actions	Example actions
All stakeholders	This biosecurity component is primarily intended to encourage operators within Welsh shore-based fishing to enhance biosecurity procedure for INNS. However, this guidance is also highly relevant to other stakeholders interacting with the marine environment, such as (but not limited to) NRW, Local Authorities, and County Council field or operational teams. At the most basic, INNS biosecurity can be achieved simply through ‘Check Clean Dry’ procedures (see GB NNSS information). At a high level, stakeholders are encouraged to review and update their protocols and practical procedures to ensure that operational biosecurity comprehensively addresses INNS and is consistently applied. Continuous improvement should also be a priority. These updates do not need to be onerous or burdensome. Enhancements can leverage existing best	• Authorities could provide support to national and local stakeholders for the implementation of improved biosecurity at sites where shore-based fishing is a priority pathway. • Consult and collaborate with the industry to ensure best practice is encouraged and enabled. The onus should be placed on pragmatic changes to procedures which do not negatively impact Welsh blue growth or individual operators. • Regularly review emerging methods and technologies that offer INNS risk reduction. • Appoint a biosecurity manager or champion to act as a central point for INNS related queries.

Responsible stakeholder	Guidance for Development of Actions	Example actions
All stakeholders continued	Enhancements can leverage existing best practices or adopt innovative approaches tailored by stakeholders themselves. <u>Appoint Biosecurity Managers or Champions</u> For operations of varying scales, appointing a biosecurity manager or champion can be beneficial. This individual, equipped with relevant knowledge and a defined responsibility for biosecurity, can oversee and ensure that biosecurity actions are conducted appropriately and effectively for their site, business, or organisation. If applicable, a biosecurity manager/champion could be appointed to provide ad hoc advice or outreach to local anglers. Possibly providing guidance on the cleaning of fishing gear and equipment and appropriate use of biosecurity practices. Particularly relevant if affiliated with an authority that owns or manages an asset with cleaning facilities. A biosecurity manager/champion could be a club/staff member already. They could be trained in the role and provided with the tools to advise other members. It is recognised that this action may only be a light-touch at the local stakeholder level and not appropriate for individual/unaffiliated shore-based fishers; however, a point of contact for the promotion of biosecurity within local user groups could provide a valuable asset for improving biosecurity at the grassroots level.	• A stand-alone BAP or to-do-list tracker could be developed for the individual operation - communicate with NRW for support and advice. • Consider collaborating with researchers to advance INNS management technologies. • Ensure innovative approaches and updated best practice is shared within the industry.

Responsible stakeholder	Guidance for Development of Actions	Example actions
All stakeholders continued	<u>Research and develop INNS management measures</u> Invest and participate in the development and testing of new methods and technologies to manage INNS. For example, working with a research body / professional.	See actions above.
Clubs	Biosecurity best-practice can also be outlined and included as part of club membership agreements or codes of practice for using sites. Examples could include the following: • Always clean kit with freshwater and leave it to dry after use. • Record and report INNS (if unsure, record it and ask the biosecurity manager). The GB Angling PAP has an example biosecurity clause from the Angling Trust that could be included in angling club constitutions: <i>“Members of the Club are asked to undertake good biosecurity practice whilst they are using the club’s fishing waters. This includes:</i> • <i>Making sure that their equipment is dry and free of mud and plant material prior to arriving at the site.</i> • <i>After every fishing trip, cleaning their equipment and boots in accordance with the Check, Clean, Dry guidance. Particular care should be given to the seams of boots and waders and the rims of nets.</i> • <i>Day ticket users visiting the club are asked to follow the same Check, Clean, Dry guidance.”</i>	• Include biosecurity statement/clause in club membership / code of practice site agreements.

5. Biosecurity facilities

The availability of a biosecurity facility (or the supply of appropriate equipment) can help promote effective cleaning, reducing the risk of INNS being transferred to or from a location.

PRIORITY ISSUE: Washdown facilities are critical for enabling the physical cleaning of gear, clothing and PPE. Enhancing the availability and accessibility of these facilities can substantially improve biosecurity effectiveness.

To note: A review of available washdown facilities within Welsh marine areas was not included in the scope of the biosecurity framework, leaving the overall status of such facilities unknown.

Responsible stakeholder	Guidance for Development of Actions	Example actions
All stakeholders	Stakeholders who manage or own assets (e.g., marina and harbour operators, local authority managed assets where shore-based fishing occurs etc.) should consider the installation of biosecurity facilities. It is acknowledged that biosecurity facilities may be multi-purpose at many locations and that facilities do not need to be overly complicated or technical (e.g., using hot water to clean rather than cold or freshwater over seawater). When planning installations, the following requirements, among other aspects like space and financial resources, should be considered. • The scale of the facility in proportion to the risk posed by the activity • Infrastructure required for the collection and disposal of wastewater and waste material in a biosecure way to prevent INNS re-entering the environment (e.g., water tanks and biological waste bins). • Supply of necessary resources, like water and electricity	• Install a freshwater (and, if possible, a hot water) supply at site where angling occurs. • Ensure that waste is controlled in a way that minimises the risk to wider habitats. • Use existing washdown facility (following improved protocols that may be outlined in Component 4).

Responsible stakeholder	Guidance for Development of Actions	Example actions
All stakeholders	Some facilities relevant to shore-based fishing include: • A freshwater tap. • Provision of hot water, hoses or dip tanks to wash equipment. • Fabrication of a designated cleaning area which will capture all waste material and waste water. • Supply of power washers and steam washers for use on some equipment. • Dip tanks to clean and disinfect equipment. Funding sources may be available to facilitate the purchase, installation and operation of biosecurity facilities. Guidance on the use of equipment at the facilities should be prominently displayed to ensure the correct application of the biosecurity measures. Additional note: It is difficult to provide a one-size-fits-all recommendation for biosecurity facilities without understanding the nuances of a particular site. The GBNSS provides good background information and a biosecurity facility support tool, which offers a useful overview of facilities. Stakeholders should be reminded that biosecurity facilities do not need to be complex and could just represent a minor upgrade to existing facilities.	• Utilise the biosecurity support tool to assist with decision making. • Review and explore the potential to upgrade existing biosecurity facilities.

Responsible stakeholder	Guidance for Development of Actions	Example actions
Individual stakeholders	Individual stakeholders (e.g. anglers, cockle pickers) should make themselves aware of Check Clean Dry procedures. They should also use the facilities that may be present at their fishing spots (this could simply be a freshwater tap which could be used to fill a cleaning bucket, and the purchase of a simple scrubbing brush) to facilitate better Check Clean Dry. Washing their kit with a hose pipe upon return home will not only preserve the life of their gear but also remove marine INNS.	• Make use of available facilities. • Ensure that equipment is cleaned and dried after use.

6. Monitoring and reporting

To establish a robust understanding of what INNS are present in Welsh marine areas and facilitate the early detection of introductions and spread.

To ensure that INNS sightings are reported to an appropriate platform and records are included in national databases.

To ensure that up to date species distribution data is available to facilitate rapid responses to new INNS introductions or spread events.

PRIORITY ISSUE: INNS monitoring and surveillance are insufficient in certain regions, with stakeholders often unaware of what to report or where to report sightings. Additionally, data flow is fragmented, data administration slow, and existing mechanisms for priority species reports reaching authorities are inconsistent, which may delay management response.

Responsible stakeholder	Guidance for Development of Actions	Example actions
All stakeholders	This focus area aims to increase the INNS monitoring and surveillance effort by shore-based fishing stakeholders. Stakeholders should take an integrated approach to monitoring (see action PS-6). By doing so, they can ensure a cohesive and unified effort that builds on and enhances existing programmes, maximising the effectiveness of monitoring across all marine pathways and action plans. Stakeholders who own or manage assets (e.g., marina and harbour operators, local authority managed assets where shore-based fishing occurs etc.) should consider implementing regular monitoring for INNS. Monitoring can either be undertaken and reported by stakeholders individually or could be through a collaborative effort with other stakeholders, for example those in academia.	- Promote and encourage the use of reporting / recording platforms. - Check biosecurity communications for opportunities to coordinate monitoring and collaborate. - Consider proactive monitoring through citizen science programmes. - Promote opportunities for integrated or collaborative monitoring efforts.

Responsible stakeholder	Guidance for Development of Actions	Example actions
All stakeholders continued	It is best to use standard procedures for monitoring high-risk INNS. Procedures may be directed from a new national approach or from existing monitoring. The best approach to monitoring for current and horizon INNS is to employ multiple methods in tandem to achieve maximum coverage of habitat and species detection. Some of the monitoring methods that could be employed include: • Rapid Assessment Surveys (optimal for detecting fouling organisms but not for planktonic or soft bottom habitat species); • Settlement plates/panels (panels placed in key areas for a pre-determined amount of time and checked periodically for marine growth or analysed in a lab); and • Environmental DNA (eDNA) (used to ascertain which species are present at a site using the genetic material that can be obtained from an environmental sample such as water). Stakeholders can contact NRW for guidance on monitoring INNS at their site at: invasive.non.native@naturalresourceswales.gov.uk Simple training and guidance should be provided to staff, focusing on recognising priority INNS, or being encouraged to report “unusual” growth or fouling. Confirmed or suspected INNS should be reported. This improves INNS distribution knowledge and the ability to reduce the spread. Information on how and where to report sightings should be included in all biosecurity materials and resources.	See actions above.

Responsible stakeholder	Guidance for Development of Actions	Example actions
All stakeholders continued	NRW recommend that INNS sightings should be reported to: • iRecord online [www.irecord.org.uk/]; and • iRecord App [available on Google Play].  Potential INNS sightings can also be reported directly to NRW at: invasive.non.native@naturalresourceswales.gov.uk Reporters should take photos and make a note of the sighting location (ideally GPS coordinates). If possible, they should take notes about the surroundings (e.g., substrate type, other species in the area, tidal height). The reporting platform should be mentioned / linked on educational materials, at workshops and in social media engagements (see Component 2). National and local stakeholders (e.g. Angling Cymru or local angling clubs) could provide members with guidance and reminders for reporting sightings.	See actions above.

Responsible stakeholder	Guidance for Development of Actions	Example actions
Authorities	It has been recognised that the reporting of INNS sightings is not as efficient as it could be. Authorities should therefore engage with local groups, citizen science surveying groups (e.g., Seasearch and Shoresearch), Local Environment Records Centres (LERCs) and non-governmental organisations (NGOs) (e.g., Wildlife Trusts) to set up or improve data-sharing links and ensure that sightings of high-risk species or new incursions of horizon species are passed to the relevant authority and acted on in a timely manner. This could involve establishing a list of National alert species and disseminating this list to all relevant parties (e.g., LERCs and NGOs). A critical analysis of the dataflow for national INNS records should be considered, with the primary aim to improve the consistency, accuracy and timeliness of reports. Making use of the existing reporting channel for commercial fishing operations, "Catch Recording App" by adding INNS as a voluntary addition to make it easier for fishers to log sightings.	• Undertake a critical analysis of the data-flow for national INNS reports. • Ensure that priority INNS reports are flagged with relevant stakeholders (e.g. iRecord species notifications). • Investigate the addition of marine INNS to the commercial fishing "Catch Recording App".
Local stakeholders	Visual surveys of the intertidal areas should be undertaken, ideally, on a regular basis; although, ad hoc surveys when visiting key sites also provide valuable data. INNS sightings should be reported / recorded on the relevant platforms. Fishers might already have a good knowledge of the "normal" plants and animals at their regular site. Reporting unexpected fouling or growth noticed during visits can provide valuable information and trigger a quick response.	• Report unusual growth or fouling to iRecord or NRW.

7. Collaborative working

To improve the collaboration between all stakeholders within Welsh marine areas where shore-based fishing occurs.

To foster open communication, build trust, and align on shared goals to drive effective outcomes.

To cooperate in decision-making and share resources to address challenges and achieve success together.

PRIORITY ISSUE 1: Stakeholders remain uncertain about advancing biosecurity implementation without clear guidance and support from regulators and authorities. Top-down leadership is crucial, complemented by inter-stakeholder collaboration. Mechanisms for sharing information, practical advice, and bespoke guidance tailored to both national and local stakeholder needs must be developed and prioritised.

PRIORITY ISSUE 2: Opportunities for coordinated and collaborative biosecurity can be missed due to limitations in communication, leading to duplicated effort and gaps.

Responsible stakeholder	Guidance for Development of Actions	Example actions
All stakeholders	All stakeholders should work to strengthen communication and collaboration mechanisms, ensuring that practical improvements and best practices are effectively shared and considered within national or regional biosecurity implementation. Open communication channels will facilitate the flow of information from authorities to stakeholders within key sectors (i.e., those whose operations may act as pathways of introduction and spread). Open channels will also facilitate the sharing of information from stakeholders to authorities. For example, carpet sea squirt sightings in new areas.	- Engage in the biosecurity framework for Welsh marine areas in some capacity. - Consider mechanisms for collaboration and integration with other stakeholders and projects.

Responsible stakeholder	Guidance for Development of Actions	Example actions
Authorities	Authorities could consider taking a leadership/coordinating role in this process by setting clear frameworks, facilitating dialogue, and ensuring that all voices are heard. Impartial guidance is critical in driving coordinated efforts, updates to national policy, maintaining transparency, and promoting a proportional approach. Authorities should ensure close working and collaboration with relevant authorities (and other stakeholders) in England (e.g., the Environment Agency) and Europe.	• Ongoing stakeholder engagement to keep INNS at the forefront of stakeholders' activities and awareness. • Establish/task an existing working group with coordinating collaborative working. • Engage and coordinate with stakeholders to monitor progress and assess future support needs

Action scaling: recreational sea angling club example

The following section provides examples of how the biosecurity components and actions listed above (under “Recommended actions for all stakeholders”) could be scaled and implemented by a recreational sea angling club within a club-specific biosecurity plan. The actions should be tailored to the site and the relevant stakeholders. The GB Angling PAP provides information on best practice to promote biosecurity for the pathway.

Table 4. Example actions for a recreational sea angling club.

Component	Example approach for recreational sea angling club
1. Understanding roles and legal responsibilities	Add a summary of INNS legislation to the club membership information.
2. Information and guidance on INNS and biosecurity	When guidance/information is received from authorities, review it to see if it is appropriate for inclusion in club material. Provide feedback on guidance/information if appropriate.
3. Raising awareness	Hand out INNS guides (hard copies) or share links to the guides (online). Include a link to the Check Clean Dry campaign in all member emails. Pay attention to signs at sites frequented for angling. Encourage members to complete online training courses on the GB NNSS website. Send out biosecurity information to registrants of club-organised events.
4. Biosecurity processes and procedures	Complete a biosecurity to-do-list tracker for the club. Appoint a club member as Biosecurity manager (or equivalent title) to coordinate the club biosecurity actions and provide support. Add a biosecurity clause into the club rules to 1) encourage biosecurity best-practice for equipment/kit cleaning and 2) discourage the use of non-native species for bait.
5. Biosecurity facilities	Identify biosecurity facilities that could be used to clean kit, especially at locations frequently visited by members. Ensure that members know how to transport and clean equipment if facilities are not available at the site.

Component	Example approach for recreational sea angling club
6. Monitoring and reporting	Encourage members to undertake a short visual search when at a site and record any suspected INNS they find, on iRecord, making sure to take a photo and record GPS co-ordinates. Encourage members to download the iRecord app onto their phones. Upload INNS sightings to iRecord as quickly as possible. If a member is not able / happy to use the app, nominate another member to upload their sightings for them. If the species is unknown, contact your local records centre who may be able to assist.
7. Collaborative working	Share information with other anglers, attend relevant workshops / events and provide feedback to authorities.

Useful resources

- [Angling clubs in Wales](#)
- [Angling Trust webpage on INNS](#)
- **GB Non-Native Species Secretariat (NNSS) resources:**
 - [Biosecurity for Anglers – Help stop the spread of invasive plants and animals in our waters](#)
 - [Event Organisers – Basic biosecurity for events](#)
 - [Check Clean Dry](#)
 - [GB Angling PAP](#)
 - [INNS management toolkits](#)
 - [Information Portal](#)
- [Wales Biodiversity Partnership INNS Group](#)
- **Welsh marine INNS priority list:** [Marine Invasive Non-native Species Priority Monitoring and Surveillance List for Wales](#)
- [Natural Resources Wales marine INNS identification guide in Welsh](#)

- [Natural Resources Wales marine INNS identification guide in English](#)
- [Marine Biological Association INNS ID guide](#)
- **Welsh marine INNS workshop kit:** May be borrowed by anyone who is running a supervised workshop for adults. It includes specimens, images, distribution maps and species information. For more information or to borrow the kit, contact: anna.holmes@museumwales.ac.uk.
- [Natural Resources Wales evidence report on the impacts of marine INNS on MPA features](#)
- [Marine Biosecurity Planning – Guidance for Wales and England \(2015\)](#)
- [Marine Biosecurity Planning - Guidance for Specific Operational/Construction Related Activities](#)
- **Full reference to the 2023 report by Eschen:** Eschen, R., Kadzamira, M., Stutz, S., Ogunmodede, A., Djeddour, D., Shaw, R., Pratt, C., Varia, S., Constantine, K. and Williams, F., 2023. An updated assessment of the direct costs of invasive non-native species to the United Kingdom. *Biological Invasions*, **25**, 3265-3276
- Valentine, P.C., Collie, J.S., Reid, R.N., Asch, R.G., Guida, V.G., & Blackwood, D.S., (2007). The occurrence of the colonial ascidian *Didemnum* sp. on Georges Bank gravel habitat: Ecological observations and potential effects on groundfish and scallop fisheries. *Journal of Experimental Marine Biology and Ecology*. 179-181.
- **Links to other Pathway Action Plans (PAPs) and Species Action Plans (SAPs)**

Links to the action plans listed below can be found on the [Wild Seas Wales website](#).

- American slipper limpet, *Crepidula fornicata* SAP
- Chinese mitten crab, *Eriocheir sinensis* SAP
- Carpet sea squirt, *Didemnum vexillum* SAP
- Trumpet tubeworm, *Ficopomatus enigmaticus* SAP
- American oyster drill, *Urosalpinx cinerea*, & Japanese oyster drill, *Ocenebrellus inornatus* SAP
- Recreational Boating (large boats) PAP
- Recreational Boating (small boats) PAP
- Recreational Activities PAP
- Commercial Shipping PAP
- Aquaculture PAP
- Vessel-based Fishing PAP