

GB Non-Native Species Pathway Action Plan: Recreational Boating

FINAL

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Drafted and supported by (among others):



Background

Reducing the risk posed by pathways of introduction and spread is a key way of tackling invasive non-native species (INNS). The GB INNS Strategy calls for the development of Pathway Action Plans (PAP) and they are also a requirement of the EU Invasive Alien Species Regulation. They can also form an element of the programme of measures under the Marine Strategy Framework Directive.

This PAP is one of a series of plans intended to address pathways of introduction or spread of non-native species in Great Britain. The plan outlines the general policy and approaches as well as actions to be taken by government and other actors in relation to this issue.

Scope

This PAP is for recreational boating, broadly defined as the use of boats designed or adapted for sport or leisure, whether by sail, oars, paddle and/or power. This includes, but is not limited to, dinghies, yachts, canal boats, personal water craft (commonly known as “jet skis”) and craft used for paddling and rowing activities. The trailers and associated equipment for these types of boats is included. This PAP does not cover commercial vessels and their ballast. Reference to ‘boats’ or ‘boating’ in this document is therefore intended to refer to a wide range of craft, in line with this definition.

The geographical scope of the PAP is Great Britain.

This plan was prepared by a working group (the GB Boating PAP Working Group) reporting to the GB Non-native Species Programme Board (see Annex 1 for membership).

This PAP necessarily takes a risk based approach to prioritising actions and focusses on key activities / sectors within recreational boating for which biosecurity is particularly important.

Rationale

We currently have about 200 non-native freshwater and marine species established in GB and these species tend to be particularly invasive. In recent decades the rate of arrival has accelerated – for instance in brackish and freshwater environments one new Ponto-Caspian species establishes in Britain every 2-3 years compared to one every 100 years before 1992. These species include the killer shrimp, demon shrimp and quagga mussel. There are many more aquatic INNS with the potential to arrive and establish in GB, including plants that can clog freshwater lakes and navigations, marine species that can foul boats and propellers and aquatic invertebrates which can completely alter natural ecosystems.

It is difficult to determine the introduction pathways of freshwater and marine INNS that have been introduced to GB so far; however, a review of pathways

undertaken as part of the [Non-native Species Information Portal](#) project¹ identified hull fouling as a potential pathway of introduction for 12 established freshwater non-native species. A very large proportion of these (58%) cause severe impacts in GB. In the marine environment, this review identified hull fouling as a potential pathway of introduction for 46 established non-native species, 26% of which were associated with more severe impacts.

The route by which INNS potentially arrive on recreational boats is also not known with certainty. In terms of freshwater species a small study at GB ports suggested that in the region of 14,000 recreational boats (including canoes / kayaks) are brought overland into GB from abroad each year. Many (most) of these will be freshwater vessels, which could potentially carry organisms if not carefully checked, cleaned and dried. Vessels may also sail directly from freshwater locations in continental Europe to freshwaters in GB; however, it is thought that this is a small risk given relatively few vessels make this journey and the period in salt-water will reduce the risk of organisms remaining attached. In terms of marine species, the main risk is thought to be vessels sailed directly from continental Europe or Ireland with fouling attached. However, marine vessels imported overland and put into the water could also be a risk. Although there are uncertainties about introduction pathways, the proven potential for negative impacts from INNS means that a precautionary approach is required.

Good biosecurity is critical to reduce the risk of introduction and spread of aquatic non-native species. Since 2011 the GB Non-native Species Secretariat has been running the *Check Clean Dry* (CCD) public awareness campaign aimed at improving biosecurity amongst water users. This has included a border campaign which started in 2016 and has grown annually since. In 2018, CCD was expanded to Northern Ireland, the Republic of Ireland, the Isle of Man and Channel Islands.

There is a [European Code of Conduct on Recreational Boating](#) that has been developed under the Bern Convention. There is also relevant domestic legislation, including the Invasive Alien Species (Enforcement and Permitting) Order 2019 and Wildlife and Countryside Act (1981) (as amended) which provides a general prohibition on the release or allowing the escape of most non-native species of animal and many plants in England and Wales, and all non-native species in Scotland.

However, legislation alone is not sufficient to manage and lower the risk associated with introducing or spreading INNS. It requires cooperation and collaboration from all concerned, each sector is part of the solution and plays an important role in INNS management and implementing best biosecurity practice. This plan sets out additional actions to help minimise the risk of introduction and movement of INNS caused by recreational boaters.

The Boating PAP working group has adapted the Bern Convention code of conduct and tailored it to the needs of GB (Annex 2). It has also developed

¹ <https://secure.fera.defra.gov.uk/nonnativespecies/downloadDocument.cfm?id=1980>

and agreed biosecurity guidance for boat users (Annex 3). Its primary output, however, has been to agree a series of measures to raise awareness among key actors in this sector and to strengthen existing biosecurity mechanisms. These actions are outlined below and they form the main body of the action plan.

Aims and objectives

The overall aim of this PAP is to reduce the risk of introduction and spread of INNS by users and providers in the recreational boating sector.

Specific objectives are to:

- Raise awareness of and facilitate the adoption of good biosecurity practice among the recreational boating sector, particularly at priority sites and events.
- Encourage event organisers and clubs to adopt good biosecurity practices.
- Encourage land owners and facilities managers (e.g. marina operators, club committees, etc.) to raise awareness of biosecurity among their users and put in place systems to facilitate good biosecurity.
- Consolidate biosecurity guidance for recreational boating and facilitate the production of clear, practical guidance where necessary.
- Identify areas where additional research could help to refine / improve recreational boating biosecurity (e.g. improving understanding of the risk posed and most effective biosecurity measures).
- Continue the work of the partnership developed under this PAP, with contributors reporting on their actions to the group 6 monthly

Prioritising Actions

While all users and providers in the recreational boating sector should be aware of and implement good biosecurity, some activities are more likely to pose a biosecurity risk than others. For example, boats used abroad and brought back to GB are more likely to pose a risk of new introductions than those used exclusively within GB, and boats moved regularly between GB water bodies are more likely to spread INNS than those used on a single body of water.

The development of this PAP included work to identify the highest risks and boating activity areas that need the key focus initially or need more work to raise awareness and find biosecurity solutions. This PAP provides broad biosecurity guidance and actions relevant to all recreational boaters, but also focuses (initially) on particular activities considered a priority. These are:

- Recreational boats entering GB from abroad.

- Freshwater boats (particularly dinghies, windsurfers, personal water craft, canoes and kayaks) moving between water bodies, particularly those moving between otherwise unconnected catchments.
- Boats that use canals and other inland waterways, particularly those being taken out and moving long distances between otherwise unconnected parts of the canal network, or moving from high risk sites.
- Marine vessels, particularly those moving long distances or being taken out of / put into the water.

The Boating PAP working group acknowledged that adopting biosecurity good practice may be more straightforward for some sectors than for others. In particular, check, clean, dry procedures can be difficult to apply to large vessels that are generally kept in the water (e.g. canal boats and large marine yachts). This PAP is focussed on practical actions that can be taken to reduce the most significant risks.

Key Actors

- Defra, Welsh Government, Scottish Government, British Irish Council GB Non-native Species Secretariat
- Environment Agency, Marine Management Organisation, Natural England, Scottish Environment Protection Agency, NatureScot, Natural Resources Wales, Centre for Environment, Fisheries and Aquaculture Science (particularly parts that manage access to water bodies or water bodies themselves)
- Association of Inland Fisheries and Conservation Authorities
- Association of Inland Navigation Authorities
- British Canoeing
- British Marine
- British Rowing
- Canal & River Trust/Glandwr Cymru
- Inland Waterways Association
- National Access Forum
- National Park Authorities
- Port and harbour authorities
- Royal Yachting Association (including RYA Scotland, RYA England and RYA Cymru)
- Sail Scotland
- Scottish Canals
- Scottish Canoe Association
- Scottish Coastal Rowing Association
- Scottish Rowing
- Sportscotland
- The Outdoor Partnership
- Boating competition organisers
- Boating equipment retailers
- Boating holiday organisers
- Local authorities (that manage boating lakes / rivers)
- Marinas (UK, France, etc.)

- Sailing / canoeing / kayaking / rowing clubs
- Water companies and other water asset owners/managers

Biosecurity at the border and international cooperation

Action 1 (freshwater)

NNSS will oversee the running of a border biosecurity campaign, based around the CCD initiative, concentrating on the high risk points of entry to GB – mainly ferries (carrying dinghies, canoes, kayaks, etc.) to and from England and the near continent.

Action 2 (freshwater)

Welsh Government will run a CCD campaign at Welsh ports connecting to the Irish Republic. Scottish Government will run CCD messages on ferries between Scotland and Ireland.

Action 3 (freshwater)

NNSS (and BIC Secretariat) will establish and run a BIC Aquatic Biosecurity group to agree co-ordinated measures, including action at ports, Eurotunnel and on ferries.

Action 4 (freshwater and marine)

NNSS will lead on liaison with the European Commission and relevant EU Member States to agree a programme of action related to aquatic biosecurity (and the spread of Ponto-Caspian species). This will target:

- Continental boaters coming to GB.
- GB boaters returning from the continent.
- Marine vessels sailing to GB.

Action 5 (freshwater and marine)

The Royal Yachting Association, British Canoeing, British Marine, British Rowing (and others) will promote the EU Code of Conduct and encourage EU member states' boating organisations to adopt CCD.

Event biosecurity

Action 6 (freshwater and marine)

The Royal Yachting Association, British Canoeing, British Rowing and British Marine will annually compile a prioritised list of events / competitions to be targeted for heightened awareness-raising such as biosecurity demonstrations etc. Separate lists will be developed for freshwater and marine activities and agreed by the working group.

Action 6A

Relevant organisers/owners will implement heightened awareness-raising activities at the prioritised sites/events.

Club and boat user biosecurity

Action 7 (freshwater and marine)

The Royal Yachting Association, British Canoeing, British Rowing, British Marine, Canal & River Trust (and others as relevant) will disseminate awareness raising materials, aiming to have posters in all club houses and training centres and frequent messages in magazines, mail outs, social media and other communications materials.

Action 8 (freshwater and marine)

The Royal Yachting Association, British Canoeing, British Rowing (and others as relevant) will encourage all clubs and training centres to add a biosecurity clause (Annex 4) to their constitutions, award systems and ideally any other contractual agreements (e.g. agreements to use / keep boats). This may be direct, or by including biosecurity in model constitutions provided to clubs.

Action 9 (freshwater and marine)

The Royal Yachting Association, British Canoeing, British Rowing and British Marine will include biosecurity in training curriculums for basic boat usage and marina operators, updating training materials as they fall due for renewal. In addition, biosecurity will be included in relevant inductions (e.g. for marina staff) and at other key points (such as inductions for those hiring boats).

Action 10 (freshwater and marine)

The Boating PAP working group (in particular British Marine working with Royal Yachting Association, Canal & River Trust, Scottish Canals, British Canoeing and others) will identify companies that transport recreational boats and aim to raise their awareness that boats need to be clean before transportation

Site biosecurity

Action 11 (freshwater and marine)

Water Companies, Canal & River Trust, Scottish Canals, Environment Agency, Natural England, NatureScot, Natural Resources Wales, Crown Estates Scotland (and other water asset managers) will put a reference to carrying out biosecurity (e.g. Annex 5) into their relevant agreements (e.g. lease and management agreements, permits, SSSI consents, etc.) related to boating as they come up for renewal. This includes using by-laws etc. to introduce biosecurity clauses for recreational boating where applicable.

Action 12 (freshwater and marine)

British Marine will encourage all marinas to add a biosecurity clause (Annex 6) to their berthing agreements. They will also encourage marinas not to allow heavily fouled boats (i.e. more than a slime layer) to be put in the water. If already in the water and heavily fouled, marinas will encourage boat owners to lift and clean their boats.

Action 12A (freshwater and marine)

British Marine will encourage marinas and boat yards to provide suitable capture and filtration systems in hull cleaning areas and, where such facilities are not available, provide advice on simple methods for minimising the risk of INNS and other pollutants entering water bodies when cleaning is taking place.

Action 13 (freshwater and marine)

British Marine, Royal Yachting Association, British Canoeing and NNSS will explore the possibility of developing an accreditation scheme for marina operators that follow good biosecurity practice, or will add INNS good practice to existing environmental recognition schemes.

Action 14 (freshwater and marine)

The working group (led by officials but working with stakeholders) will compile and maintain a list of sites/waterways which contain critical INNS (at GB, National or Regional levels) that are a priority to contain/slow the spread (see Annex 7 for GB critical species list) and where recreational boating occurs.

Action 14A

Owners and managers of these sites will install facilities and signage to promote very high biosecurity, this may include:

- Single point of access and egress where possible
- Suitable hard standing (and boat storage) where relevant / possible
- Hot water (including steam) wash down facilities if possible (cold if not)
- Large prominent signage
- Enact biosecurity by-laws where possible.

Action 14B

Organisers of boating events will implement heightened awareness-raising activities and ensure strict biosecurity at the prioritised sites.

Action 14C

Canal & River Trust, Environment Agency and NNSS will identify 'pinch points' in the canal network on which biosecurity effort could be focussed to reduce the risk of spread from SE England to the rest of the network and implement biosecurity measures at these points.

Action 15 (freshwater and marine)

Royal Yachting Association and British Marine, with support from NNSS, will provide site-based biosecurity training for freshwater and marine marina / harbour operators in high priority areas (i.e. those identified in Action 14).

Action 16 (marine)

In England only, the Marine Management Organisation will control in-water cleaning of more heavily fouled vessels through marine licensing (including using enforcement measures). In-water cleaning of very lightly fouled marine vessels is exempt from the requirement for a marine licence (as specified in legislation: Section 8.3 <https://www.gov.uk/government/publications/marine->

licensing-exempted-activities/marine-licensing-exempted-activities--2). It is important to note that in-water cleaning is not exempt from licencing in Scotland and Wales.

Data requirements and evidence gaps

The actions in this PAP are based on available evidence relating to the risk posed by recreational boats and potential mitigation. However, there are gaps in our knowledge and further research could help to better understand and target biosecurity action. The Boating PAP working group wishes to highlight particular evidence gaps that should be considered a priority:

1. Research is required to better understand what proportion of freshwater boats could be contaminated with viable INNS and whether there are different levels of risk associated with different types of vessel, parts of vessels or activity.
2. Linked to (1), research is required into the effectiveness of check, clean, dry at removing viable INNS.
3. There are still gaps in our understanding of the number of vessels (particularly freshwater) that enter GB waters, from where and by which route.
4. The extent to which fouled marine vessels arrive in GB is not quantified. It would be useful to understand the extent to which this occurs and, more importantly, where the majority of vessels carrying INNS originate from and where they arrive in GB.
5. For marine vessels and canal boats a major barrier to good biosecurity is the practicality of cleaning them. Research and innovation in improved methods will help to improve biosecurity.

Monitoring and updating

The working group will be re-convened by the NNSS every 6 months to assess progress with achieving the actions and review the plan. These meetings will be held alternately by telecon and face-to-face. Group members are expected to submit data etc. on progress in advance of each meeting where relevant / possible. The group will consider all relevant information and organisations will report back on all actions to which they are a party.

The broader impact of the PAP on recreational boat biosecurity will be measured by the:

- Number of organisations/clubs/authorities/sites signed up to promote CCD.

- Changes to baseline awareness and uptake of biosecurity among recreational boaters (following the public attitudes survey).

Pre-Consultation Draft

Annex 1. Working Group members

Royal Yachting Association (Chair)
NNS (Secretary)
Anglian Water
British Canoeing
British Marine
British Rowing
Canal & River Trust
Centre for Environment, Fisheries and Aquaculture Science
Department for Environment, Food and Rural Affairs
Environment Agency
Marine Management Organisation
Natural England
Natural Resources Wales
Scottish Canals
Scottish Environment Protection Agency
Scottish Government
NatureScot (formerly Scottish Natural Heritage)
The Green Blue
Welsh Government

Pre-Consultation Draft

Annex 2.

Code of Conduct Recreational Boating and Invasive Non-Native Species

Ideas and texts for this code were drawn from the Council of Europe European Code of Conduct on Recreational Boating and Invasive Alien Species and tailored to fit the requirements of Great Britain. It is primarily aimed at clubs and boating organisations as well as the managers and landowners of sites where recreational boating occurs.

Background

Invasive non-native species (INNS) are plants, animals and diseases that are introduced by people and which have a negative impact. They are one of our most important environmental threats and can cause substantial economic damage and impacts on human health. The total cost to the British economy is estimated at £1.7 billion per annum, with at least £26.5 million per annum spent in Great Britain (GB) managing freshwater INNS alone (Oreska and Aldridge, 2010; Williams et al., 2010). They can cause problems for recreational boat users damaging equipment, fouling submerged structures, blocking water intakes, increasing maintenance costs, affecting navigation and reducing access to waterbodies.

Adopting preventative measures to avoid unintentional introduction and spread of INNS is widely accepted as the most effective approach to tackle their threat. The EU Invasive Alien Species Regulation and GB INNS Strategy both aim to target pathways of INNS introductions, prioritizing them and putting measures in place to minimize their introduction and establishment.

Recreational boating broadly defined as the use of boats designed or adapted for sport or leisure, is a potential pathway for both the introduction and spread of aquatic INNS in GB. With over 3 million boat users, there is a significant risk that INNS could be introduced to or spread within GB on boats, trailers or boating equipment. It is anticipated that through education, awareness raising and behaviour change we will reduce the risk of introduction of INNS by recreational boating and ensure that boating forms part of the solution, acting as the 'eyes and ears', spotting and reporting the spread of INNS as well as participating in their control and eradication.

This code of conduct aims to encourage effective practices to prevent future movement of INNS by recreational boating activity. Boating organisations and institutions hosting boating activity on their waters also have an important role to educate boaters on the impacts of INNS and the importance of biosecurity. The recommendations outlined here aim to increase the engagement of boating organisations in their role in raising awareness of INNS.

Measures

This code consists of different measures for (1) clubs and boating organisations, and (2) managers and landowners of sites where recreational boating occurs, which are set out below. In each case the code is separated into suggested minimum measures and more advanced recommendations to follow where possible.

(1) Clubs and boating organisations

Suggested minimum:

- Assess the risks associated with activities undertaken by the club / organisation, including equipment used and sites visited.
- Inform staff and members of the risks posed by INNS and the need for good biosecurity.
- Provide biosecurity training opportunities for staff, members and others.
- Provide adequate biosecurity equipment, including cleaning facilities and drying rooms.
- Support awareness raising activities to inform all boaters about INNS and encourage good biosecurity (e.g. Check Clean Dry campaign, Invasive Species Week), including providing signage and guidance.
- Be aware of and comply with relevant policies, laws and byelaws, e.g. those that relate to boating and / or biosecurity.

Where possible:

- Appoint a biosecurity manager / champion within the organisation who will have responsibility for ensuring biosecurity measures are implemented.
- Recruit volunteers or staff members to supervise biosecurity procedures at meetings, events etc.

(2) Managers and landowners of sites where recreational boating occurs

Suggested minimum:

- Assess the risks associated with activities undertaken on the site, including pathways of introduction into and away from the site, points of access and equipment used.
- Develop a biosecurity plan to minimise risk, including limiting access points, providing biosecurity facilities, raising awareness and implementing relevant regulation.
- Inform staff and site users of the risks posed by INNS, the need for good biosecurity and know what to do / who to report to if an INNS is found at the site.
- Provide biosecurity training opportunities for staff, members and others.
- Provide adequate biosecurity equipment, including cleaning facilities and drying rooms.
- Support awareness raising activities to inform all boaters about INNS and encourage good biosecurity (e.g. Check Clean Dry campaign, Invasive Species Week), including providing signage and guidance.

Where possible:

- Limit access and egress to the water, preferably to a single spot. This is particularly important where a new INNS has been identified and it is recommended that boaters should log in and out of site confirming they have checked and cleaned their clothing and equipment to allow containment.
- Provide boats and equipment at the site and use these in preference to personal equipment brought in from off site.
- Provide biosecurity stations / cleaning facilities. These should not be connected to the drainage system and should be inspected regularly.
- Appoint a biosecurity manager / champion within the organisation who will have responsibility for ensuring biosecurity measures are implemented.
- Recruit volunteers or staff members to supervise biosecurity procedures on the site.

Pre-Consultation Draft

Annex 3. Biosecurity guidance for boat users

Biosecurity guidance for boat users

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Pre-Consultation Draft

1. Background

This guidance refers to recreational boating, which is broadly defined as the use of boats designed or adapted for sport or leisure, whether by sail, oar, paddle and/or power. This includes, but is not limited to, dinghies, yachts, canal boats, personal water craft (commonly known as “jet skis”) and craft used for paddling and rowing activities. The trailers and associated equipment for these types of boats is included. It does not cover commercial vessels and their ballast. Reference to ‘boats’ or ‘boating’ herein is therefore intended to refer to a wide range of craft, in line with this definition.

Good biosecurity practice should be followed by all those involved in recreational boating to avoid the introduction and spread of invasive non-native species (INNS). However, some activities are more likely to introduce or spread INNS than others. In cases of heightened risk, more comprehensive biosecurity measures are required. Different biosecurity measures may also be required depending on the vessels and activities involved. The aim of this document is to provide a single text that brings together broad biosecurity advice for different activities, vessels and levels of risk associated with recreational boating.

This guidance is aimed at those that advise boat users, but can also be followed by boat users themselves. It can be modified / elaborated if necessary to suit a particular need or activity as long as this is in support of the basic principles of biosecurity.

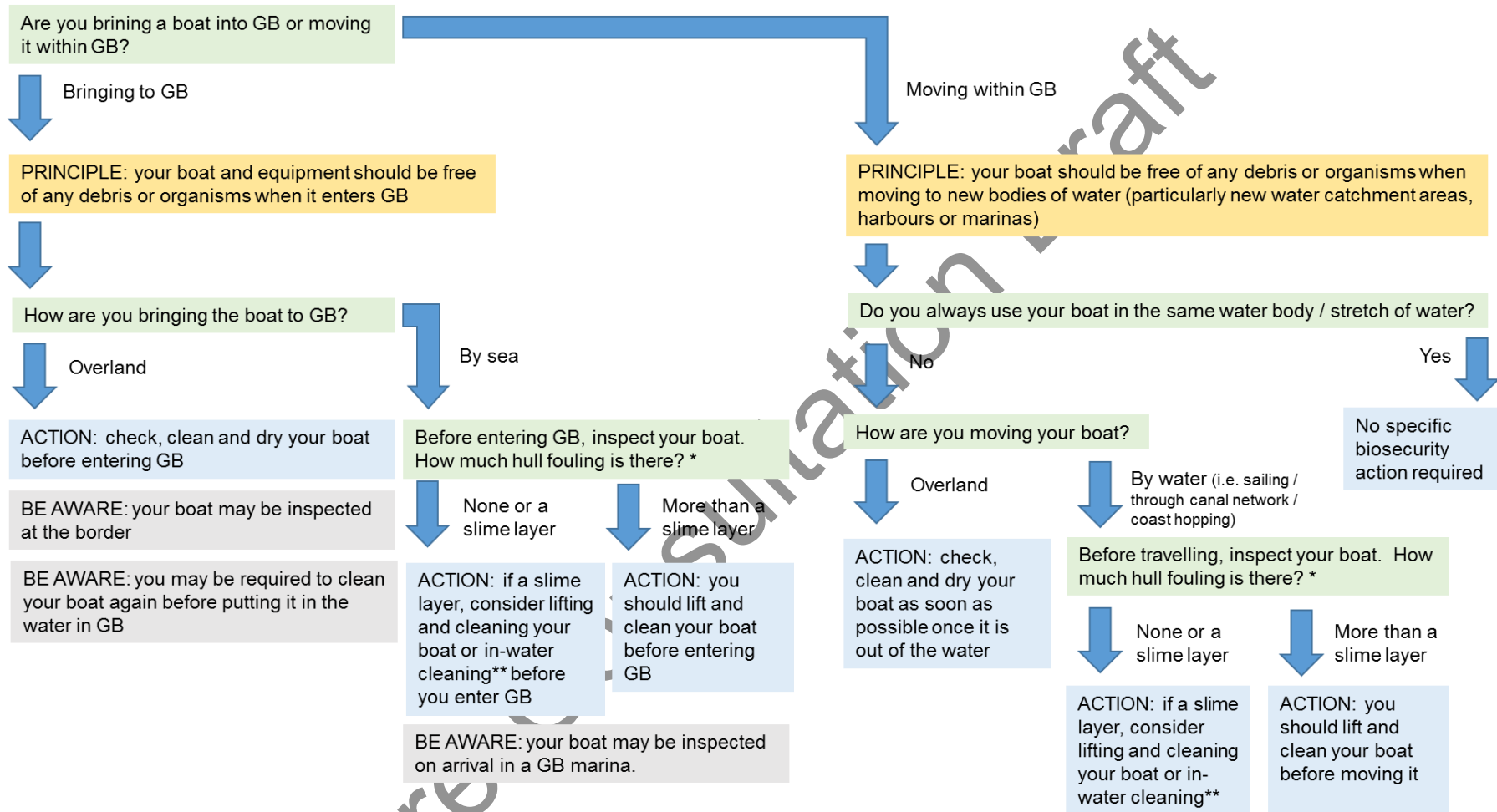
This guidance was compiled by the GB Recreational Boating PAP Working Group.

2. Principles of biosecurity, relevant to all recreational boat users

Recreational boats moved between water bodies, or sailed to new stretches of water, should be free of viable material (e.g. seeds, plant / algal fragments, eggs, larvae, animals) that might introduce a non-native species. In practice, these can be very small (sometimes not visible to the naked eye), so boat users and commercial providers should make sure no visible organic matter or water is moved with the boat and that the boat is checked, cleaned and dried (where practical) between movements. While biosecurity is important for all movements of recreational boats it is particularly important when bringing a boat into GB from abroad or moving a boat between unconnected water bodies and coastal regions.

3. Decision tree to help identify biosecurity actions

The attached diagram provides a quick reference guide to what biosecurity action should be taken in different scenarios, recognising some activities may be associated with higher biosecurity risk and the ability to implement biosecurity actions may differ between activities. This diagram identifies actions that should be taken, guidance for which is provided separately below.



* Tip: regular maintenance will reduce the risk of heavy fouling

** In-water cleaning is only permissible (under strict conditions) in England, it is not permissible in Scotland or Wales

4. Basic check, clean, dry for all recreational boaters

When moving between water bodies or new stretches of water overland, recreational boat users should check, clean and dry:

- Check
 - Check boats, equipment and clothing after leaving the water for mud, aquatic animals or plant material. Remove anything you find and leave it at the site.
- Clean
 - Clean everything that has come into contact with the water thoroughly as soon as you can, paying attention to ropes, bilges, trailers, anchors, engines and areas that are damp and hard to access. Use hot water if you can (see “hot water treatment” below).
- Dry
 - Drain water from every part of your boat and trailer before leaving the site. Dry everything for as long as possible before using elsewhere as some invasive plants and animals can survive for two weeks in damp conditions.

All recreational boat owners should also:

- Avoid sailing or paddling through patches of weed (which could contain invasive species). This can chop up plants and can spread them further.
- Be aware of the increased risk of bringing boats, trailers and equipment into GB from abroad.
- Be aware of the increased risk when placing a boat into a water body with particularly sensitive ecology, such as a nature reserve, Special Area of Conservation, or Marine Protected Area.
- Be familiar with local by-laws pertaining to biosecurity.

Useful resources, including instructional videos for powerboats, dinghies, windsurfers and personal watercraft are available at:

<http://www.nonnativespecies.org/checkcleandry/index.cfm>

5. Additional detailed guidance for those advising boat users

Before use:

- An appropriate anti-fouling coating system and good maintenance can help prevent biofouling accumulation (see section 9 for details).
- Boats should be used regularly to reduce the risk of biofouling of the hull and engine. If you haven't used your boat in a while, lift and clean it before you move to a new stretch of water. If you know you won't be using your boat for a while, consider having it hauled out and dry-stored.
- In the marine environment, you can consider cleaning your vessel in-water if it is only lightly fouled (i.e. a slime layer or less). See the in water cleaning guidance below (section 10) and decision tree above. Note: in-water cleaning is only allowed in England, and only for light fouling (a slime layer or less). Boats in Wales and Scotland should be lifted and cleaned (see section 10 for details).

On the water:

- If the boat is not in use and stationary for a period of time, if possible, raise propellers (outboard motors) out of the water to minimise the risk of INNS entering the engine.
- If an anchor has been used, wash off both the anchor and chain before stowing.
- Any structures or equipment such as pontoons, piles and buoys which have been submerged in water for a time also pose a higher risk of spreading INNS and so care should be taken when working with them to avoid the spread of INNS. This would include taking them out of the water for cleaning before being moved to a new site.

After use:

- Once the boat is on shore, remove all visible plant and animal material and put in the bin.
- Use clean water to wash down all parts of the boat that have been in contact with the water (including outboard, trailer and trolley/vehicle tyres). Pay attention to any crevices. Flush outboard engines with clean water before leaving the site using appropriate equipment, flush mufflers in accordance with manufacturer's recommendations.
- Drain all water from the boat, including bilges. Allow the water to drain completely from engines by placing them in a vertical down position.

Recreational Boating Pathway Action Plan

- Wash and dry all equipment, clothing and footwear. Drying for as long as possible is important because some INNS can survive for over two weeks in damp conditions.
- If clean water washing facilities are not available on site, ensure that the boat is washed down, drained and dried prior to arrival at another waterbody.
- Ensure that any wash water run-off or water emptied from boats after use does not drain into another waterbody.

Boat storage on land:

- Store boats and outboard engines in a location where any run-off does not drain into a waterbody (e.g. drains, gullies or rivers).
- Return any engines to their vertical down position to drain.
- Use the general waste bin to dispose of any plant or animal material found in prop bags or other equipment.

6. Paddle sports and rowers

The basic biosecurity advice above, as well as some of the additional detailed guidance, is relevant to those partaking in paddle sports.

In addition, when cleaning boats paddlers and rowers should pay particular attention to the bow and stern of the boat, under the seats and rims and behind buoyancy bags and foot rests.

A towel or sponge can be used to dry kit, but will need to be washed after use (unless you can dry them out properly between uses). You might need to think of innovative ways of reaching inside the end of your boat but it's important to do so.

When cleaning equipment, pay particular attention to folds of cagoules, dry suits, buoyancy aids, spray-decks, throw-lines, and the clothes you wear under your cagoules.

Encourage all fellow paddlers to follow good biosecurity practice.

7. Narrow boats and other boats that use canals

Many types of vessels use canals, all of which should endeavour to apply as many of the basic and detailed biosecurity measures as possible.

In addition, for boats being removed from water:

Recreational Boating Pathway Action Plan

- Apply the basic check, clean, dry measures above, paying particularly attention to fenders, props and the lip around boat.
- Make sure the boat is free of any organic material before being placed back in the water.

Boats staying in the inland waterway network for long periods:

- Avoid taking your boat through patches of weed, which could spread them further through the canal network.
- If your boat has more than a slime layer of biofoul ideally it should be lifted out of the water and cleaned before being moved elsewhere.
- Apply regular short bursts of reverse thrust when underway to throw off and unwrap any weed caught around prop.
- Periodically carry out a visual inspection to see if any weed can be observed caught up on fenders or transoms for example.
- If your vessel has an inboard engine check any weed filters or strainers and clear them regularly.
- If the vessel is a narrowboat, lift and check for weed via the weed hatch where fitted and when safe to do so.

8. Hot water treatment

Where possible the use of hot water can provide a simple, rapid and effective method to clean equipment.

Submerging equipment for about 15 minutes at around 45°C can effectively kill a number of significant aquatic INNS.

This technique is useful for participants who may be cleaning equipment such as wetsuits when they return home, however it is not practical for cleaning large equipment such as boats.

If hot water is available on site, hot pressure washers can also be effective for cleaning boat hulls. Use of chemicals is not recommended as not all species are susceptible to each product.

9. Antifouling

An appropriate antifouling coating system and good maintenance are the best way of preventing biofouling accumulation for boats kept on the water.

Lifting out, cleaning and antifouling annually keeps boat hulls clean, and has environmental benefits including both preventing the spread of INNS and also improving fuel efficiency.

Different antifouling coating systems suit different operating profiles. An appropriate antifouling coating should be chosen by seeking expert advice and considering the time period between coatings, the use, location and type of the vessel and any legal requirements in the country of use.

It is important to note that antifoul may not be effective against all species in all areas, for example, some types of antifoul are thought to be ineffective against biofouling by zebra mussels.

Therefore, appropriate antifouling should be combined with good maintenance, in-water cleaning (in England) and the Check, Clean, Dry approach where possible. The more a boat is used the less likely species will accumulate and the more effective any antifouling will be. By using the boat regularly over summer/growing season, the level of fouling can be reduced.

Antifouling is, by its nature, toxic to aquatic life. Since the banning of Tributyltin (TBT), most antifouls are now copper or zinc based. Available biocides are regulated by European and national regulations; however, during evaluation of these products, their toxicity should be balanced with their efficacy against biofouling, particularly by aquatic invasive non-native species.

Some of the compounds found in these antifouls can enter the environment through leaching or during removal of the paint, accumulating in organisms, forming concentrated deposits in the sediments and finding their way into wildlife further up the food chain. Boat owners can play a vital role in preventing concentrated scrapings from entering the water by following this best practice advice:

When removing antifoul:

- Select a marina, club or boatyard which has a wash-down facility which collects residues and captures run off from wash down, or prevent antifoul scrapings from entering the water by collecting in a tarpaulin.
- Use a dustless vacuum sander or wet abrasion to reduce toxic dust and to protect the user's health.
- If using scrubbing piles, only scrub off the fouling and not the underlying paint – be careful not to let old or new paint enter the water.

When applying antifoul:

- Select the right type of antifouling for the area and boat usage, choosing the lowest levels of biocides and copper suitable for your needs – take advice from the local chandlery. Use water-based paints where possible, or paints low in Volatile Organic Compounds or look into using less

damaging bottom paints, such as vinyl, silicone or Teflon, which are suitable for in-water hull cleaning systems.

- Apply the right amount of antifouling required and do not spill it – when applying use a sheet to collect drips.
- Dispose of used brushes, rollers and trays and empty cans of antifoul as hazardous waste.

10. In-water cleaning of marine vessels (see decision tree above also)

It is always preferable to clean boats out of the water where waste can be effectively captured for proper disposal.

However, in England only, in-water cleaning can also be used as an interim measure to remove light fouling. In this case cleaning can only be undertaken by hand using specific equipment (set out below).

In-water cleaning is not allowed in Scotland or Wales.

In-water cleaning is allowed in England because it has been made an exempted activity by Article 27A of the [Marine Licensing \(Exempted Activities\) \(Amendment\) Order 2019](#). As such, fouling can only be removed from that part of the hull of a vessel which is normally submerged, subject to the condition that the removal of the substance is undertaken by hand, using only (a) a soft cloth; (b) a sponge; (c) the bristles of a soft brush; (d) sandpaper, the grit size of which is at least P2000. See ISO 6344-3:2013 which sets standards for the determination of grain size distribution in relation to coated abrasives. This is accessible at <https://www.iso.org/standard/56010.html> and is available for inspection at the offices of the Department for Environment Food and Rural Affairs, Seacole Building, 2 Marsham Street, London, SW1P 4DF, United Kingdom.

In-water cleaning can be suitable, and is only permitted, for removing light fouling, predominantly if the boat has been in the water for less than a year but has not been frequently used and therefore may have accumulated light fouling.

Particular consideration should be given to in-water cleaning prior to long distance trips, if cleaning out of the water is not possible. This will help prevent INNS from being transferred long distances, for example from one country to another.

Before undertaking any in-water cleaning, check with the local authorities for any regulations regarding the in-water cleaning of boat hulls and / or the discharge of chemicals into the water column. In water cleaning systems are available in some marinas, or the process can be carried out by hand:

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- Use gentle techniques to minimize both the release of toxic substances from any anti-fouling coating and the degradation of the anti-fouling coating system.
- Take care not to deplete the anti-fouling coating system, which would then rapidly re-foul. In-water cleaning should not be used in order to delay haul-out beyond the specified service life of a coating.
- A soft cloth, sponge, or sandpaper (the grit size of which is at least P2000) can be used to clean as much material off as possible. Alternatively, use a long handled soft brush from the pontoon or the boat to clean off the material.
- Collect the material into a bucket or bag for disposal on land where practical.

11. Useful links

Activity	Link
Guidance for boaters	http://www.nonnativespecies.org/checkcleandry/biosecurity-for-boat-and-kayak-users.cfm www.rya.org.uk/go/invasivespecies
Guidance for paddlers	http://www.nonnativespecies.org/checkcleandry/biosecurity-for-boat-and-kayak-users.cfm https://www.britishcanoeing.org.uk/go-canoeing/access-and-environment/environment-good-practice/
Guidance on the use of anti-foul	http://www.rya.org.uk/go/antifouling
Guidance for clubs and land managers	http://www.nonnativespecies.org/checkcleandry/biosecurity-for-clubs.cfm https://thegreenblue.org.uk/clubs-centres-associations/facilities-operations/biosecurity/
Marine biosecurity	http://www.nonnativespecies.org/index.cfm?pageid=621 Biosecurity planning in Wales and England
Freshwater biosecurity	http://www.nonnativespecies.org/index.cfm?pageid=622
Additional general guidance	International Maritime Organisation Guidelines for the Control and Management of Ships' Biofouling to Minimize the Transfer of Invasive Aquatic Species (2011) http://www.imo.org/en/OurWork/Environment/Biofouling/Documents/RESOLUTION%20MEPC.207[62].pdf International Maritime Organisation Development of International Measures for Minimizing the Transfer of

	<p>Invasive Aquatic Species through Biofouling of Ships: Guidance for Minimizing the Transfer of Invasive Aquatic Species as Biofouling (Hull Fouling) for Recreational Craft (2012) http://www.imo.org/en/OurWork/Environment/Biofouling/Documents/MEPC.1-Circ.792.pdf</p> <p>Bern Convention: European Code of Conduct on Recreational Boating and IAS https://wcd.coe.int/ViewDoc.jsp?p=&id=2442263&Site=&BackColorInternet=B9BDEE&BackColorIntranet=FFCD4F&BackColorLogged=FFC679&direct=true</p> <p>In water cleaning regulations in England Section 8.3 https://www.gov.uk/government/publications/marine-licensing-exempted-activities/marine-licensing-exempted-activities--2</p>
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Annex 4. Biosecurity clause for club constitutions

BIOSECURITY

Members of the Club are asked to undertake good biosecurity practice when using their equipment. This includes:

Making sure that your equipment, including boats, trailers and clothing, is clean and free of any mud, plant material or pooled water prior to arriving on site.

After every use, cleaning your boats, trailers, clothing and other equipment in accordance with Check, Clean, Dry guidance. Particular care should be given to areas where water may pool or be trapped, including within the hollow elements of trailers and outboard engines (if used).

Any visitors to the Club are asked to follow the same Check, Clean, Dry guidance.

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Annex 5. Example of biosecurity included in by-law / agreement with boaters

Excerpt from:

ANGLIAN WATER SERVICES LIMITED WATER INDUSTRY ACT 1991 –

WATER PARKS BYELAWS 2014

BOATS and BOATING

17. Use and Sailing of Boats etc.

17.1 No person shall, without the consent of Anglian Water launch, use or sail any boat on any water in a water park.

17.2 No person shall use or sail any boat on any water in a water park without complying with current biosecurity requirements agreed between Anglian Water and Defra having regard to any guidelines published by the GB Non-native Species Secretariat and by notice exhibited in a conspicuous position or published by any other means.

17.3 No person shall use or sail on any water in a water park any boat otherwise than in accordance with such terms and conditions as may be specified in any such consent.

source: <https://anglianwaterparks.co.uk/sites/default/files/pdf/Confirmed-Waterparks-Byelaws-23-March-2015.pdf>

Annex 6. Biosecurity clause for inclusion in berthing agreement terms and conditions

BIOSECURITY

For the purposes of this agreement Hull fouling is defined as the accumulation of aquatic organisms (plants and animals) on the surface of the Vessel, beyond that of a slime layer.

You must ensure the Vessel is free of Hull fouling before it is placed into the Berth [or mooring] and while it is kept there.

If Hull fouling is present, you must lift and clean the Vessel, preventing any removed material from re-entering the water. You must inform the Company and agree a timescale over which to clear the Vessel.

If the Vessel is not cleaned within this time, the Company reserves the right to lift and clean the Vessel at your expense.

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Recreational Boating Pathway Action Plan

Annex 7. List of priority species that we want to keep out (most are not yet present in GB but some are, and we do not want to add to the numbers present) and for which there is a risk of introduction via boating. [Impact scores for freshwater species are from: Gallardo, Belinda & Aldridge, David. (2013). Review of the ecological impact and invasion potential of Ponto Caspian invaders in Great Britain. Priority of marine species is based primarily on the results of horizon scanning (Roy et al 2020, in prep)]

Freshwater and Brackish species

Priority	Latin name	Common name	Impact	Year of introduction to GB	Widespread?
V high	<i>Neogobius melanostomus</i>	Round goby	5		
	<i>Proterorhinus semiluaris</i>	Freshwater tubenose goby	5		
	<i>Proterorhinus marmoratus</i>	Tubenose goby	5		
High	<i>Neogobius gymnotrachelus</i>	Racer goby	4		
	<i>Dreissena r. bugensis</i>	Quagga mussel	5	2014	very localised
	<i>Dikerogammarus villosus</i>	Killer shrimp	4	2010	very localised
	<i>Myriophyllum heterophyllum</i>	Various-leaved Water Milfoil	-	2015	Very localised
	<i>Ludwigia peploides</i>	Water primrose	-		
Med	<i>Echinogammarus ischnus</i>		3		
	<i>Echinogammarus trichiatus</i>		3		
	<i>Dikerogammarus bispinosus</i>		3		
	<i>Limnomysis benedeni</i>		3		
	<i>Obesogammarus crassus</i>		3		
	<i>Pontogammarus robustoides</i>		3		
	<i>Hypania invalida</i>		3	2008	localised
	<i>Chelicorophium robustum</i>		3		
	<i>Chelicorophium sowinskyi</i>		3		
	<i>Alternaterna philoxeroides</i>		-		

Marine species

Priority	Latin name	Common name
High and Very High	<i>Amphibalanus reticulatus</i>	Barnacle
	<i>Asterias amurensis</i>	Northern Pacific Seastar
	<i>Caulerpa racemose</i>	Sea Grapes
	<i>Ciona savignyi</i>	Sea Squirt
	<i>Didemnum vexillum</i>	Carpet Sea-Squirt
	<i>Dyspanopeus sayi</i>	Say Mud Crab
	<i>Echinogammarus ischnus</i>	Bald Urchin Shrimp
	<i>Geukensia demissa</i>	Ribbed Horsemussel
	<i>Megabalanus coccopoma</i>	Titan Acorn Barnacle
	<i>Megabalanus coccopoma</i>	Titan Acorn Barnacle/ Large Pink Barnacle
	<i>Megabalanus tintinnabulum</i>	Sea Tulip

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	<i>Megabalanus zebra</i>	Barnacle
	<i>Polysiphonia subtilissima</i>	Red Algae
	<i>Pseudochattonella verruculosa</i>	Alga
	<i>Rapana venosa</i>	Veined Rapa Whelk
	<i>Styela plicata</i>	Pleated Tunicate
Medium	<i>Alexandrium catenella</i>	A Dinoflagellate
	<i>Asterias amurensis</i>	Flat Bottom Sea Star
	<i>Rapana venosa</i>	Veined Rapana Whelk
	<i>Rhopilema nomadica</i>	Nomad Jellyfish

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