Tamar Estuaries

MARINE BIOSECURITY PLAN

CONTEXT

2017 - 2020

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NATURAL ENGLAND

TAMAR ESTUARIES CONSULTATIVE FORUM
OUR COMMON ASSET

PML | Applications Ltd

THE MARINE BIOLOGICAL ASSOCIATION
Est. 1884
Incorporated by Royal Charter 2013

C2W Marine Matters Managed
www.c2w.org.uk

What are Invasive Non-Native Species (INNS)?

Invasive Non-Native Species are those that have been transported outside their natural range and that damage our environment, the economy, our health and the way we live.

What is Biosecurity?

Biosecurity means taking steps to make sure that good practices are in place to reduce and minimise the risk of spreading invasive non-native species. A good biosecurity routine is always essential, even if invasive non-natives are not always apparent.[1]

What is a Vector or Pathway?

These are the means by which a species is moved from place to place due to human activity.

Abbreviations and Acronyms

DEFRA	Department for Environment, Food and Rural Affairs
GB NNSS	GB Non-Native Species Secretariat
GES	Good Ecological Status (within WFD) or Good Environmental Status (MSFD)
MBA	Marine Biological Association of the UK
MSFD	Marine Strategy Framework Directive
NE	Natural England
NNS	Non-native species or NIS (Non-indigenous species)
PCC	Plymouth City Council
PML	Plymouth Marine Laboratory
PPMLC	Port of Plymouth Marine Liaison Committee
SAC	Special Area of Conservation
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
TECF	Tamar Estuaries Consultative Forum
WAG	Wembury Voluntary Marine Conservation Area Advisory Group
WFD	Water Framework Directive

[1] GB NNSS https://secure.fera.defra.gov.uk/nonnativespecies/index.cfm?pageid=174

Context

The purpose of the Biosecurity Plan is to establish a guiding framework to reduce the risk of the introduction of new invasive non-native species (INNS) to the Tamar Estuaries area and to effectively manage existing INNS. This will be achieved through the voluntary collaborative effort of all organisations and interested parties within the area. The Biosecurity Plan describes the marine biosecurity issues identified within the Tamar Estuaries area and presents actions that have been agreed with stakeholders for the prevention, early detection, control and mitigation of the introduction and spread of INNS.

It follows the 3-stage approach as recommended within the GB Invasive Non-Native Species Framework Strategy[2]:

- Prevention – most effective and least environmentally damaging
- Rapid Response – early detection and surveillance, potential eradication
- Control & Containment – where the INNS is widespread and eradication is not feasible, control of the population and mitigation against negative impacts

Of these, the first 2 stages are the most cost effective. The ultimate key to the effectiveness of the Biosecurity Plan is the building of local awareness, capacity and partnerships to ensure the success and long term sustainability of the presented actions.

The successful adoption of recommendations in the Biosecurity Plan is expected to bring about the following socio-economic and environmental benefits:

- Identifying the Tamar Estuaries area as an area which is proactively managed by its stakeholders to ensure the maintenance and enhancement of biodiversity – invasion by non-native species is one of the top five drivers of global biodiversity loss and is increasing with globalisation and tourism[3].
- The maintenance of the aesthetic character and utility of areas of the Tamar Estuaries.
- Ensuring INNS management in the Tamar Estuaries area follows national guidelines and is cost effective.
- The reduction or slowing of the introduction of INNS to other parts of the UK via the Tamar Estuaries area acting as a potential 'gateway' for marine INNS into the UK.
- Enabling stakeholders to take ownership of the problem and its solutions.

The preparation of the Biosecurity Plan was funded by Natural England as part of a wider marine biosecurity contract awarded to C2W[4]. It was developed using the Marine Biosecurity Guidelines for England and Wales[5] and similar plans produced for the Firth of Clyde[6] and Shetland Islands[7]. The Tamar Estuaries Consultative Forum (TECF) was considered to be the client and will ultimately be the owner of the Biosecurity Plan.

The aims, outputs and actions of this Biosecurity Plan were produced primarily by staff from the Marine Biological Association (MBA) and PML Applications Ltd under contract to C2W, working with stakeholders consisting of certain members of the TECF plus other interested parties. Its development was supported by a Biosecurity Workshop where a wider group of organisations and individuals could input to the process of identifying issues and solutions to the problem of INNS within their sector or area of interest. The Biosecurity Plan therefore represents the agreed approach of NE, TECF, local stakeholders and appropriate regulatory agencies.

Estuaries are characterised by many overlapping statutory authorities and functions which means that the management of the water is not in the hands of a single organisation. For over 20 years, the Tamar Estuaries Consultative Forum has provided the vehicle as the single management body, bringing together all the relevant authorities with responsibility for managing the waters of Plymouth Sound and the Tamar Estuaries. TECF's membership comprises all the organisations with statutory powers or functions relating to the estuary see Table 1 for membership.

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[2] Invasive Non-Native Species Framework Strategy https://secure.fera.defra.gov.uk/nonnativespecies/index.cfm?sectionid=55
[3] Convention on Biological Diversity 1993 http://www.cbd.int/convention/text
[4] www.c2w.org.uk
[5] Cook, E.J., Macleod, A. Payne, R.D., and Brown, S. (2014) edited by NE and NRW (2015). *Marine Biosecurity Planning – Guidance for producing site and operation-based plans for preventing the introduction and spread of non-native species in England and Wales* - www.nonnativespecies.org/downloadDocument.cfm?id=1401
[6] http://www.clydemarineplan.scot/wp-content/uploads/2016/05/FoCF-Biosecurity-plan.pdf
[7] https://www.nafc.uhi.ac.uk/research/msp/biosecurity/BiosecurityPlan.pdf

Together, TECF, the Port of Plymouth Marine Liaison Committee (PPMLC) and the Wembury Voluntary Marine Conservation Area Advisory Group (WAG) provide the vehicles for co-operation and delivery in a working environment characterised by shared and overlapping interests and responsibilities. They facilitate co-operation and consultation in the performance of statutory duties and provide a clear mechanism for communication between the wide-ranging interest groups and decision-makers.

Table 1: Membership of the Tamar Estuaries Consultative Forum

Tamar Estuaries Consultative Forum (TECF)	
Queen's Harbour Master	West Devon Borough Council
Associated British Ports	Plymouth City Council (PCC)
Cattewater Harbour Commissioners	South Hams District Council
Environment Agency	Cornwall Council
Natural England	Sutton Harbour Company
English Heritage	Marine Management Organisation (MMO)
Devon & Severn IFCA	Duchy of Cornwall
Cornwall IFCA	South Devon AONB
	Tamar Valley AONB

PPMLC includes representatives of the various estuary users, owners and interest groups. WAG comprises organisations with an interest in the management of the Wembury Voluntary Marine Conservation Area. Appendix 1 illustrates the membership and management structure of these groups.

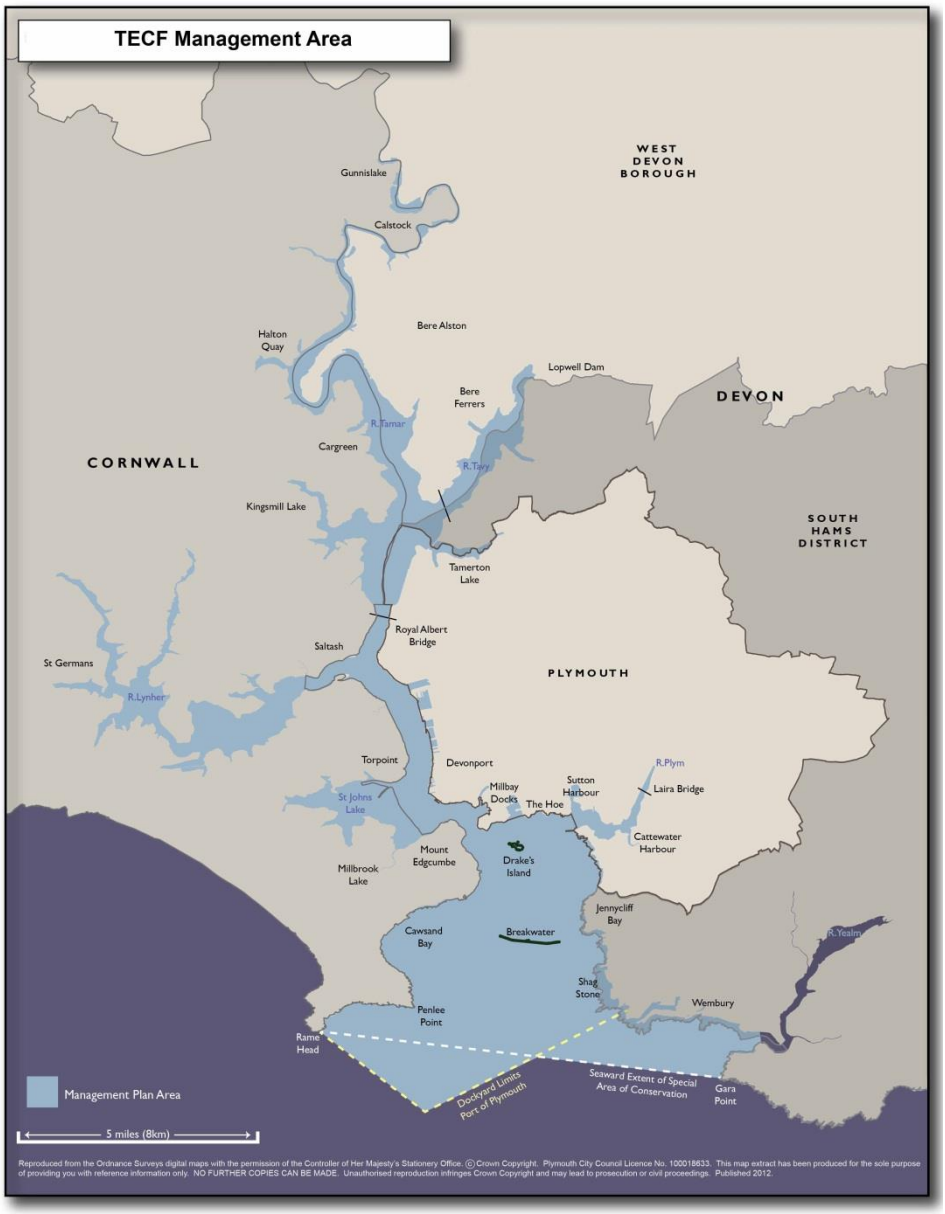

Fig. 1: TECF Management Area

Biosecurity: The Nature of the Problem

Non-native species (NNS) have been introduced deliberately, for cultural and economic benefit, and accidentally to the UK over many hundreds of years. With the increase in global shipping, aquaculture and recreational tourism, however, there is now a greater threat of introducing non-native species to the marine environment. This can be exacerbated by climate change depending on the tolerance and adaptability of individual species. Not all NNS are invasive from the start of their establishment as some take time to establish and develop rapid growth required for invasive behaviour. Climate change is expected to have a significant impact on biodiversity and NNS in years to come. Climate change could make conditions more favourable for NNS and where NNS are already present they may become invasive.

Non-native species become 'invasive' (INNS) when they thrive aggressively and threaten native species, ecosystems, natural features (such as riverbanks), or interfere with manmade structures and business interests such as aquaculture or fisheries. INNS are one of the greatest threats to biodiversity, being capable of rapidly colonising a wide range of habitats and excluding the native flora and fauna. This can be through competition for resources such as space, light and food or in some cases, local species can become prey to INNS.

There is little empirical evidence relating to the cost of impacts of marine INNS, Defra have estimated that INNS cost the UK economy at least £2 billion per year[8]. Without some form of co-ordinated and systematic approach to the prevention of introduction and control of the spread of INNS, it is likely that the ecological, social and economic impacts and the costs for mitigation, control and eradication of these species will continue to increase. In contrast to terrestrial INNS, marine INNS are still greatly understudied, and so far, only a fraction of the invaders and their impacts have been recorded. In addition, knowledge of successful control methods in the marine environment is in the early stages of development.

INNS can be released and spread through many different pathways in the marine environment. Experience from around the world would suggest that these include the following, in no particular order[9]:

- hull fouling of both commercial and private vessels
- fouling of other recreational equipment, e.g. diving gear, fishing lines, sea kayaks, mooring ropes, dinghies, canoes, clothing
- ballast water exchange
- distribution through water transfer of planktonic stages
- escape or release of plants and animals from aquaria
- live bait or its live packaging released or escaped
- importation or movement of new species (historically), shellfish or stock for aquaculture
- movement of organisms through canal systems
- organisms attached to structures and equipment subsequently relocated e.g. pontoons, aquaculture cages, dredges and other artificial structures
- organisms moving on marine debris/litter/dredge spoil
- relocated fishing gear

The extent to which INNS expand once introduced can be down to a number of factors. Increased numbers of marine INNS are often seen in areas impacted by human activities and therefore successful INNS may demonstrate characteristics that allow them to perform better in altered habitats than native species, for example on pontoons and pilings[10]. Lower salinity and cooler water temperatures can hamper the invasion of some species, whilst warmer water sources such as power station outflows can act as refugia.

Given the high costs for the mitigation, control and eradication of INNS once they are established, the Biosecurity Plan emphasises the need for prevention of arrival and, failing that, rapid response to the

[8] The Great Britain Invasive Non-native Species Strategy - http://www.nonnativespecies.org/index.cfm?sectionid=55
[9] Bax N, Williamson A, Aguero M, Gonzalez E, Geeves W (2003) Marine invasive alien species: a threat to global biodiversity. Marine Policy 27, 313-323
[10] Tyrrell MC and Byers JE (2007) Do artificial substrates favor non indigenous fouling species over native species? Journal of Experimental Marine Biology and Ecology 342, 54-60

introduction of INNS before they become established. The Biosecurity Plan therefore identifies pathways and develops actions to limit the likelihood of INNS entering the Tamar Estuaries area in the first place.

Management of INNS at a local scale in inshore waters is a new approach and there is much to learn regarding successful prevention and control of organisms in open systems. Indeed, even identification of marine INNS can be difficult, often requiring microscopic examination of a sample to distinguish it from native species. It is therefore important to develop a rigorous reporting, identification and recording system as part of any Biosecurity Plan. In terms of control of existing INNS, mechanical methods are favoured as chemical methods would usually also involve the destruction of native flora and fauna and biological methods, such as the introduction of a predator, can alter the ecosystem in other unforeseen ways.

Policy and Legislation

A detailed description of the various international, EU and UK policies and legislation relevant to NNS is given in the Marine Biosecurity Guidelines for England and Wales[11].and in the legislation section of the GB NNSS website[12]. The most significant of these are:

- The 2004 International Convention for the Control and Management of Ships' Ballast Water and Sediment which aims to address the issue of transport of INNS in ballast water; this comes into force in September 2017.

- The European Strategy for Invasive Alien Species. Obligations by member states are set out in the EC Birds Directive, the EC Habitats Directive and the Water Framework Directive.

- The European Water Framework Directive (WFD) which states that the ecological status of water bodies can be reduced if INNS have damaged the native aquatic plant and animal communities.

- The European Marine Strategy Framework Directive (MSFD), this requires Member States to work towards 'good environmental status' (GES) of their marine waters by 2020. The characteristic of GES for INNS is that 'non-indigenous species introduced by human activities are at levels that do not adversely alter the ecosystems'. Biosecurity planning would help to deliver two of the three targets for achieving GES which are:
  - Reduction in the risk of introduction and spread of non-native species through improved management of high risk pathways and vectors.
  - Species specific management plans for high risk invasive alien species identified as already present or likely to be introduced into the UK to be in place by 2020.

- The EU Invasive Alien Species regulation **(**2015) requires that pathways action plans be in place to control the introduction and spread of listed species (currently the only marine species listed is the Chinese Mitten Crab). For marine species these action plans may include future requirements for biosecurity plans.

- The Wildlife and Countryside Act 1981 which makes it illegal to release or allow to escape into the wild any animal which is not ordinarily resident in GB and is not a regular visitor to GB in a wild state, or is listed in Schedule 9 to the Act[13]. It is also illegal to plant or otherwise cause to grow in the wild any plant listed in Schedule 9 to the Act. Biosecurity planning will help to raise awareness of INNS good practice, and lessen the likelihood of people releasing INNS back into the wild and committing an offence under this Act.

[11] Cook, E.J., Macleod, A. Payne, R.D., and Brown, S. (2014) edited by NE and NRW (2015). *Marine Biosecurity Planning – Guidance for producing site and operation-based plans for preventing the introduction and spread of non-native species in England and Wales* - www.nonnativespecies.org/downloadDocument.cfm?id=1401

[12] [12] http://www.nonnativespecies.org/home/index.cfm

[13] http://www.ukwildlife.com/index.php/wildlife-countryside-act-1981/schedule-9/

Existing Planning Framework

This Biosecurity Plan links Government-led policy, legislation and strategic action with local actions and reflects, implements and/or supports the provisions and requirements of the following Plans:

- Tamar Estuaries Management Plan 2013 - 2018[14]
- The Plymouth Plan (in development)
- South West Marine Plan (in development)
- Local Biodiversity Action Plans
- South West river basin district river basin Management Plan[15]

The Biosecurity Plan supports the conservation objectives of Sites of Special Scientific Interest (SSSIs), Special Protection Areas (SPAs) and Special Areas of Conservation (SACs) within the Tamar Estuaries area.

[14] TAMAR ESTUARIES CONSULTATIVE FORUM 2012. Tamar Estuaries Management Plan 2013 - 2018. Plymouth City Council (PCC).
[15] South West river basin district river basin management plan https://www.gov.uk/government/publications/south-west-river-basin-district-river-basin-management-plan

Appendix 1 – Management structures for the Tamar Estuaries