



RAPID

Reducing and Preventing
Invasive Alien Species Dispersal

Version 1
November 2018

REGIONAL INVASIVE ALIEN SPECIES MANAGEMENT PLANS (RIMPS): SOUTH EAST REGION



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ACKNOWLEDGEMENTS



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**The South East Regional Invasive Alien Species
Management Plan**

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EXECUTIVE SUMMARY



This document is a part of the RAPID LIFE Project, a three-year EU LIFE funded project (2017 - 2020), whose objective is to deliver a package of measures to reduce the impact and spread of IAS in freshwater aquatic, riparian and coastal environments across England. RAPID seeks to bridge the gap between high-level strategies (such as the GB IAS strategy) and action on the ground at local level and overseen by the Animal and Plant Health Agency (APHA), working in partnership with British Zoological Society and National England and coordinated by Alexia Fish.

Using a template and guidance developed by national IAS experts, local experts have produced RIMPs for each of five regions in England: North, Midlands, East of England, South West and South East. The RIMPs deliver consistent (but regionally tailored) recommendations on prevention, early warning, rapid response, eradication and control of IAS (in the above listed target environments) throughout England. The purpose of the current document is to guide IAS management activities in the south east region to help in planning for strategic and coordinated actions with other regions. The south east region is 1,582,500 ha., comprises 18 complete catchments, covers part of the counties of Hertfordshire, London, Essex and Surrey and all of Kent, Sussex and Hampshire, as well as of the Isle of Wight. In the development of this RIMP, 2 stakeholder engagement events were held (one for freshwater and one for estuarine and marine locations), to review the draft RIMP, as well as gain additional feedback from experts. A total of 34 stakeholders were consulted during the development of the south east RIMP.

This document categorises IAS in the South East region by priority. It also details pathways of introduction, the hotspots and areas of high conservation value and also the key stakeholders. In this document, IAS are allocated to a priority category for management based on their risk and relative occurrence in the region: Black – prevention; Red – eradicate; Amber & Green – long-term management

The RIMPs also contain information and/or links to information on IAS identification, reporting procedures and best practice management guidelines. The South East RIMP highlights the need for biosecurity as a key priority and that stakeholders need to continue to communicate on the subject of IAS, especially in relation to large undefined areas such as coastal catchments. All of the RIMPs will be reviewed and updated as needed to reflect current trends, partnerships and best IAS management practices.



GLOSSARY OF TERMS



- **Biosecurity:** Preventative measures, designed to reduce the risk of disease and/or spread of organisms
- **Catchment:** The area of land drained by a river and its tributaries. All tributaries and main rivers which meet are classed in a catchment.
- **Coastal area:** Where the marine environment meets the terrestrial environment
- **Estuarine area:** Brackish water where freshwater rivers meet the coastal and marine environment
- **Hotspot area:** An area or site which already has an abundance of invasive species within it
- **High risk area:** Areas that are very likely to be invaded (e.g. have a lot of recreational traffic)
- **High value area:** A sensitive area of particular importance (see Site of High Conservation Value)
- **INNS:** Invasive Non-Native Species. For more information please see the [GBNNS](#) website.
- **Invasive Species:** A non-native species that has the ability to spread, causing damage to the environment, the economy, our health and the way we live
- **Non-Native Species:** Species or subspecies, introduced outside its natural past or present distribution. **Please note, not all non-native species are considered detrimental, in fact, the majority have no negative impacts and are not invasive.** For more information please see the [GBNNS](#) website
- **Pathway:** Defined by APHA as a broad term used to describe the way in which INNS are introduced or spread (and encompasses, for example, the purpose, route and mode of introduction)
- **Regional Sites of High Conservation Value:** Sites and landscapes that are designated and protected
- **Riparian:** The interface between the land and a river or stream such as the river bank
- **Sensitive area:** Areas that may be invaded (and would suffer significant impacts were they invaded)

THE RAPID LIFE PROJECT

Globally, invasive alien species (IAS) are considered to be one of the most significant causes of biodiversity loss, second only to habitat destruction (Convention for Biological Diversity). RAPID (Reducing and Preventing IAS Dispersal) LIFE is a three-year EU funded project working to protect freshwater aquatic, riparian and coastal biodiversity by embedding a coordinated, strategic and evidence-based approach to managing IAS across England. In doing so, this project seeks to bridge the gap between high-level strategies and action on the ground at a local level.

Please note that IAS is the European term for invasive species but as INNS (invasive non-native species) is the most commonly used term in the UK (and is synonymous with IAS), this term will be used for the most part throughout the rest of this document.

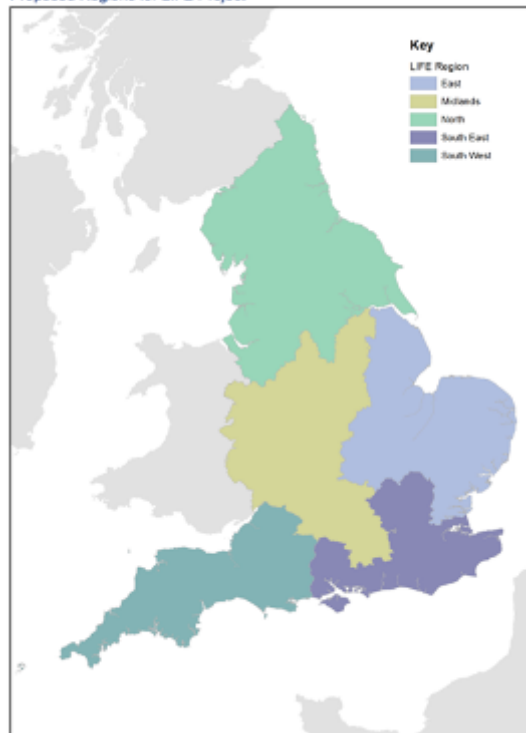


THE RIMPS

The RAPID LIFE project splits England into five regions (see Figure. 1 page 7). An integral component of RAPID is the development of Regional INNS Management plans (RIMPs). Using a template and guidance developed by national INNS experts, local experts have produced RIMPs for each of the five regions in England. These plans aim to deliver consistent, but regionally relevant, information and advice for prevention, early warning, rapid response, eradication and control of INNS.

Each RIMP focuses on three key elements for invasive species management: 1) building partnerships and collaborations; 2) education and awareness raising; and 3) control and management. Each RIMP works to identify regional and local potential pathways and 'hotspots' for INNS introductions, assisting local stakeholder groups to identify priority areas for awareness-raising and modes of delivering educational messages.

Proposed Regions for LIFE Project



THE SOUTH EAST RIMP

The South East Region

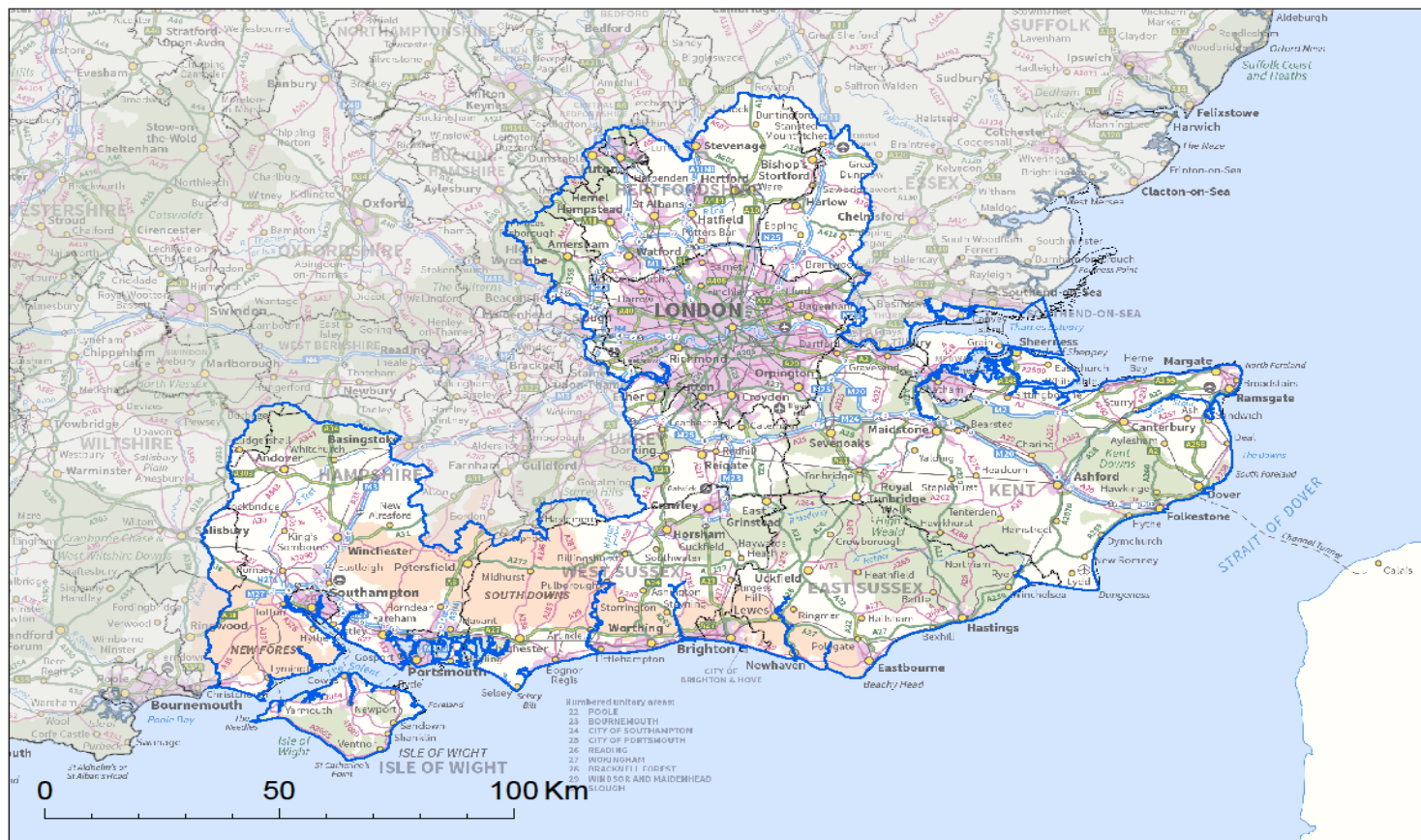


Figure. 1 For the purposes of the RAPID LIFE Project, England has been split into five regions.

Figure. 2. The South East RAPID LIFE region includes the following counties; London, Hertfordshire, Kent, East and West Sussex and Hampshire. Part of the county of Surrey is included but most of that county falls into the Midlands RIMP. The entirety of the Isle of Wight is also included.

The RAPID LIFE regions are based approximately on Environment Agency management catchments. Within the South East region there are 2 transitional and coastal (TraC) catchments and 17 freshwater catchments, see Figure. 3, page 8.

South East Region - Management Catchments



Figure 3
the South
East RIMP -
Management
Catchments



SOUTH EAST RIMP METHODOLOGY:



The RIMPs are designed to be living documents with the intention that they will be updated in response to the changing face of INNS in the region. Building on existing knowledge and experience in INNS, the South East Regional RIMP has been compiled by Medway Valley Countryside Partnership (MVCP) and Medway Swale Estuary Partnership (MSEP). MVCP and MSEP compiled this report via:

- Analysis of species data from Local Environmental Record Centres (Kent and Medway, Sussex and Hampshire), examination of NBN Atlas and other survey data platforms such as Botanical Society for Britain and Ireland, JNCC and MarLIN and via collation of existing guidance on INNS management, pathways and impacts, available by the GB Non Native Species Secretariat
 - Following discussion with APHA, pre 2008 data was not included. In order to try to keep the document as up to date as possible we only looked at data from the last 10 years.
 - **MVCP/MSEP have not recreated any individual records and have not knowingly obtained any non-commercial data without permission.**
 - Research for the SE RIMP was limited by existing knowledge and obtainable data. MVCP/MSEP were unable to gain some non-commercial data to help research for the RIMP due to issues with the associated costs. Please note therefore that further information is available for this region, specifically for London and Hertfordshire.
- Freshwater and coastal consultation events took place with regional stakeholders were delivered on 18th and 19th July 2018 and additional networking events and meetings also undertaken across the region.
- Data has been gathered by catchment and then amalgamated to provide one overarching document, though catchment level information remains available in Management Priority Grids.



SECTIONS 1 AND 2:



SOUTH EAST RIMP - PATHWAYS, ASSOCIATED STAKEHOLDER AND PRIORITIES AREAS FOR EDUCATION:

In order to facilitate targeted biosecurity education and awareness raising, the RIMPs identify regional and local existing and potential pathways of INNS and the associated stakeholders.

Pathways and stakeholders have been identified for catchments but summarised overall for the South East region.

A pathway is defined by APHA as '*a broad term used to describe the way in which INNS are introduced or spread (and encompasses, for example, the purpose, route and mode of introduction)*'.

The following table highlights overarching pathways and also the relevant 'Priority Area for Education' based on that pathway. The table includes how education and awareness raising could be delivered to the relevant stakeholders. Cross reference the following table with the Stakeholders table on pages 18 to 20 for additional information.

Additional priority areas for education not linked to specific pathways are included on pages 17.

More generic information about marine pathways can be found via the GB [Non-Native Species Secretariat](#) website.

With reference in the following tables to biosecurity, more information can be found on the [Freshwater / Marine Biosecurity Resource](#) pages on the RAPID LIFE page and also via the [Check Clean Dry](#) campaign page, both of the GB Non-Native Species Secretariat website.

Notes on where to find more information are included in the following table.

TABLE 1: PATHWAYS, ASSOCIATED STAKEHOLDER AND PRIORITIES AREAS FOR EDUCATION

PATHWAY TYPE	PATHWAY	PRIORITY AREA FOR EDUCATION	ASSOCIATED STAKEHOLDERS	EDUCATION DELIVERY MECHANISM	LOCATION NOTES (where applicable)	NOTES (where applicable)
AQUACULTURE i.e. Fish, molluscs, crustaceans and seaweed	INNS may, at development stages (due to their small size), go undetected in aquaculture stock	Biosecurity and awareness raising	See Industry (Aquaculture) Stakeholders - page 20)	Biosecurity and training of relevant aquaculture staff and engagement with relevant stakeholders such as Aquaculture Stewardship Council, in order to ensure and promote best practise guidance implementations	Hotspots: North Kent and Thanet, though this applies to all the Thames and SE Trac	See the RAPID LIFE Marine Biosecurity Resources on the NNSS website
SHIPPING	<p>Ballast Water: INNS may be taken up by ballast water and dispersed where ballast water is released</p> <p>Biofouling: INNS may adhere to boat surfaces and be introduced to new locations, where they either become detached or release propagules</p> <p>Cargo - INNS may be attached to/be within cargo and introduced to new locations from where they can spread</p>	Biosecurity and awareness raising	<p>Association of Port Health Authorities, local ports and with relevant river user and boating fraternity groups</p> <p>See — Industry (Ports) Stakeholders page 20</p>	<p>Liaise with and raise awareness of the issue with relevant boards and stakeholders</p> <p>Ensure best practise guidance is adhered to and that ports are promoting good practise towards biosecurity procedures</p>	<p>Relevant to the South East Trac (transitional and coastal) waters. The tidal Thames, estuarine and coastal habitats</p>	<p>The Ballast Water Management (BWM) Convention (which requires all ships to implement a BWM plan, carry a ballast water record book and carry out BWM procedures to a given standard) came into force in Sept 2017</p> <p>See also the RAPID LIFE Marine Biosecurity Resources on the NNSS website</p>

PATHWAYS, ASSOCIATED STAKEHOLDER AND PRIORITIES AREAS FOR EDUCATION...

PATHWAY TYPE	PATHWAY	PRIORITY AREA FOR EDUCATION	ASSOCIATED STAKEHOLDERS	EDUCATION DELIVERY MECHANISM	LOCATION NOTES (where applicable)	NOTES (where applicable)
<p>ACCESS: RECREATIONAL BOATING (INC MODEL BOAT USE) PADDLE SPORTS, WATER-SPORTS AND OUTDOOR/WILD SWIMMING</p>	<p>INNS may spread via attaching to and being moved via boats and other equipment used via activities such as recreational boating and paddle sports</p> <p>This is especially important where water bodies cross catchment boundaries and at high risk areas</p> <p>For ease, all recreational water vessels are listed here under boating or water-sports</p>	<p>Raise awareness of biosecurity and Check Clean Dry to the relevant groups</p>	<p>See Stakeholders - Recreational and Voluntary - page 19</p>	<p>With correctly targeted information for sport/vessel type, attend relevant local events such as river festivals, paddle sport competitions, triathlons and set up and demonstrate Check, Clean, Dry via event biosecurity 'wash down' stations and raise awareness</p> <p>Liaise with local relevant retailers to facilitate Check Clean Dry leaflet and information dispersal</p>	<p>Throughout the region.</p> <p>See High Risk Areas (pages 26 to 29) for more information on specific locations</p>	<p>See Check Clean Dry campaign and the RAPID LIFE Freshwater Biosecurity Resources on NNSS website</p>
<p>FISHING / ANGLING</p>	<p>INNS may spread via attaching to and being transported by angling equipment. (See High Risk Areas pages 23 to 26)</p>	<p>Raise awareness of Check, Clean, Dry with local fishing clubs and members.</p> <p>Work with strategic level stakeholders, the Angling Trust and relevant retailers to ensure wide spread message dissemination.</p>	<p>See Stakeholders - Recreational and Voluntary - page 19</p>	<p>With correct information for fishing type, attend relevant local events such as angling competitions and set up and demonstrate Check, Clean, Dry via event biosecurity 'wash down' stations and raise awareness.</p> <p>Liaise with local relevant retailers to facilitate Check Clean Dry leaflet and information dispersal</p>	<p>Throughout the region.</p> <p>See High Risk Areas (pages 26 to 29) for more information on specific locations</p>	<p>See Check Clean Dry campaign and the RAPID LIFE Freshwater Biosecurity Resources on the NNSS website</p>

PATHWAYS, ASSOCIATED STAKEHOLDER AND PRIORITIES AREAS FOR EDUCATION...

PATHWAY TYPE	PATHWAY	PRIORITY AREA FOR EDUCATION	ASSOCIATED STAKEHOLDERS	EDUCATION DELIVERY MECHANISM	LOCATION NOTES (where applicable)	NOTES (where applicable)
ACCESS: HIKING, CYCLING, HORSERIDING, DOG WALKING AND VIA FIELD STAFF	<p>INNS may spread via attaching to and being translocated by people undertaking a variety of outdoor activities such as walking, hiking, cycling, horse-riding or by professionals doing site surveying</p> <p>This is especially important when considering riverside public rights of way, bridleways, long distance trails and designated areas especially targeted by people interested in these activities</p>	Raise awareness of and promote biosecurity procedures specific for the user groups	Local authority Public Rights of Way teams, Ramblers Association, National Trails teams. Local Riding Clubs and Kennel Clubs	<p>With correctly targeted information for activity type, attend relevant local events, such as walking festivals, riding competitions, Crufts, and set up and demonstrate relevant biosecurity via 'wash down' stations (or equivalent) and raise awareness.</p> <p>Liaise with local relevant retailers and event organisers to facilitate biosecurity leaflet and information dispersal</p>	See High Risk Areas (pages 26 to 29)	See Biosecurity in the Field pages on the NNSS website
ACCESS: TRANSPORT / CAR PARKS AND RAILWAY LINES / NATURAL SPREAD ALONG CORRIDORS	<p>INNS have been seen to spread along roads and railway embankments. These locations act as corridors to dispersal and constant traffic may allow for repeat introduction.</p> <p>Areas associated with roads such as car parks and laybys have also proven to be linked to INNS introduction and spread (Ewald, N.C 2014)</p>	<p>Raise awareness of the importance of management among relevant professional stakeholders and reiterate that control of certain INNS is essential to stop spread from these locations.</p> <p>Raise awareness among local drivers who use certain laybys and car parks</p>	<p>Local authority highways teams Network Rail Forestry Commission (re' local car parks at key sites) Public Rights of Way teams Network Rail</p>	<p>Specific training events and courses aimed at key stakeholders and organisation staff in order to ensure they understand the importance of control and best practise biosecurity</p> <p>Signage at key car parks</p>	It has been reported that many informal lay-bys near Forestry Commission sites in the New Forest have exacerbated the threat of INNS spread via this pathway	See Biosecurity in the Field pages on the NNSS website

PATHWAYS, ASSOCIATED STAKEHOLDER AND PRIORITIES AREAS FOR EDUCATION...

PATHWAY TYPE	PATHWAY	PRIORITY AREA FOR EDUCATION	ASSOCIATED STAKEHOLDERS	EDUCATION DELIVERY MECHANISM	LOCATION NOTES (where applicable)	NOTES (where applicable)
HORTICULTURE - GARDEN / POND ESCAPEES	'Natural' escapes from / spread from gardens bordering natural areas and rivers	Raise awareness of suitable and sympathetic planting and the Be Plant Wise campaign with horticultural groups	Royal Horticultural Society Local garden centres and horticultural groups Aquatic Plant Society	Awareness raising with horticultural groups and retailers to ensure INNS are not on sale or indirectly among the saleable products (such as aquatic plants). Raise awareness with staff Work with retailers to disseminate relevant literature and information Set up Be Plant Wise stands at local garden centres Work with RHS to raise awareness during National Gardening Week and equivalent	Throughout the region	See the Horticultural Code of Practice document and the Gardening Without Harmful Invasive books on the Non Native Species Secretariat website
WILDLIFE PARKS AND ZOOS - ACCIDENTAL ESCAPES	Wild non-native animals escaping from wildlife parks and zoos in the region	Work with zoo staff to ensure up to date skills and knowledge. Promote Zoo's Pathway Action Plan and help zoo's promote their ethos in this area	London Zoological Society Aspinall Foundation Local Wildlife Parks	Strategic work with relevant bodies and NNS to ensure local compliance and safeguarding delivery	Throughout the region	See Pathway Action Plans on the Non Native Species Secretariat website

PATHWAYS, ASSOCIATED STAKEHOLDER AND PRIORITIES AREAS FOR EDUCATION...

PATHWAY TYPE	PATHWAY	PRIORITY AREA FOR EDUCATION	ASSOCIATED STAKEHOLDERS	EDUCATION DELIVERY MECHANISM	LOCATION NOTES (where applicable)	NOTES (where applicable)
DREDGING	Movement of large equipment from one area to another in order to carry out dredging works (clearing the bed of a marina/harbour/river of silt and debris)	Liaise with relevant local stakeholders who undertake such activities and oversee contractors in order to ensure that contracts and methodologies include a biosecurity element	Environment Agency Internal Drainage Board Local Countryside/Field Workers County Council Flood Teams	1-1 training with relevant stakeholders to highlight the requirements for a biosecurity statement to be included in contracts and internal method statements and therefore to make sure equipment is clean before transport and before entering a new waterbody	Throughout the region	See Check Clean Dry campaign
WASTE MATERIAL	Irresponsible dumping and disposal of garden and pond waste	Raise awareness of the Be Plant Wise campaign and work with relevant stakeholders and retailers to disseminate the message	Local garden centres, Royal Horticultural Society, Aquatic Plant Society and local garden groups and clubs	Awareness raising with horticultural groups and retailers to ensure consumers are aware of their responsibilities and how to properly dispose Set up Be Plant Wise stands at local garden centres Work with RHS to raise awareness during National Gardening Week and equivalent	Throughout the region	See Be Plant Wise information on the NNSS website
PLANNING, DEVELOPMENT AND LANDSCAPING SCHEMES	Inappropriate planting of new development sites	Raise awareness with key local housing developers and with local authority planning departments to ensure appropriate landscaping plans	Property Care Association. Local housing developers and local authority planning staff	One to one training of appropriate landscaping and delivery of Be Plant Wise campaign to relevant staff Work with local authority to ensure new development planning applications include a detailed landscaping outline with species list and that INNS biosecurity is part of the planning process.	Throughout the region	See Be Plant Wise information on the NNSS website

PATHWAYS, ASSOCIATED STAKEHOLDER AND PRIORITIES AREAS FOR EDUCATION...

PATHWAY TYPE	PATHWAY	PRIORITY AREA FOR EDUCATION	ASSOCIATED STAKEHOLDERS	EDUCATION DELIVERY MECHANISM	LOCATION NOTES (where applicable)	NOTES (where applicable)
DELIBERATE RELEASES / PLANTING	<p>Releases by special interest groups for 'ethical and religious reasons'</p> <p>The deliberate release of unwanted pets (such as terrapins)</p> <p>The deliberate planting of horticultural and food plants, for later harvest</p>	<p>Raise awareness of INNS and the potential outcome following deliberate releases and plantings</p>	<p>Relevant religious groups</p> <p>Pet shops</p> <p>Local Community Groups</p>	<p>Work with strategic stakeholders to disseminate the message to members</p> <p>Raise awareness at relevant religious events</p> <p>Work with relevant retailers to disseminate message to consumers and take away relevant information with certain pet purchases</p>	<p>Throughout the region</p>	<p>See Pet Code of Practice and the Importation of Non-Native Animals information on the Non Native Species Secretariat website</p>
AIR TRAVEL	<p>INNS coming into the region within imported products such as fruit</p> <p>INNS having hitch hiked on aeroplanes</p> <p>Passengers bringing items such as plants and seeds into the region</p>	<p>Work with airport staff to assist NNS and ensure strategic level approaches to increased biosecurity</p> <p>Work to raise awareness with passengers regarding the importance of not carrying items out or back to the region/ country</p>	<p>See Industry (Airports and Associated Stakeholder) on page 20</p>	<p>Be the local delivery arm for any strategically driven training and awareness raising activities via NNS</p> <p>Contact and liaise with regional airports regarding biosecurity awareness raising events and exhibitions at local airports to raise awareness and understanding of the potential issues and responsibilities of travellers</p>	<p>Throughout region</p>	<p>International air travel has been reported as a significant factor in the movement of economically damaging pest species in the US, with 73% of recorded pest interceptions in the US occurring at airports (Oxford University 2007)</p>



ADDITIONAL PRIORITY AREAS FOR EDUCATION

The following table highlights additional generic 'priority areas for education' not linked to specific pathways.

PRIORITY AREA FOR EDUCATION	ASSOCIATED STAKEHOLDERS	EDUCATION DELIVERY MECHANISM	LOCATION NOTES (where applicable)	NOTES (where applicable)
<p>Awareness raising amongst school children regarding:</p> <p>INNS / biosecurity risk with certain activities such as cycling, pond dipping, hiking</p> <p>Identification of plants for increased Health and Safety</p> <p>Introduction to topic of INNS to assist with future understanding</p> <p>Surveying and sampling to equip next generation with vital skills</p>	<p>Local authority education teams</p> <p>Local schools</p>	<p>Specific 1-1 lessons with school children. Can be tied into another subject/activity such as Forest School or pond dipping</p> <p>Creation and distribution of school packs with fun educational material on INNS</p> <p>Alternative approaches to engage with new young audiences include historic plays, art or photography competitions (see examples from MVCP below)</p> <p>Work with older school children to ensure wildlife survey and sampling skills are learnt and the lessons learnt from earlier sessions on biosecurity are not forgotten</p>	<p>Throughout the region, especially where certain species, such as Giant Hogweed, are abundant</p>	



Figure 4. MVCP school pack © MVCP 2018



Figure 5. INNS theatrical production

As part of their *Past Plants, Future Flora* (Medway Catchment INNS) Project, Medway Valley Countryside Partnership (MVCP) created an INNS school pack (see Figure. 4) and employed a local theatre company to write and perform a play on plant hunters and introduced plant species (see Figure 5)



SECTION 3: KEY REGIONAL STAKEHOLDERS:



The following lists include the key regional stakeholders who were contacted as part of the consultation process for the South East RIMP compilation and additional key stakeholders who should be engaged with in the future regarding INNS strategy.

For further information see Sections 1 & 2 on Pathways.

For convenience, stakeholders have been listed in alphabetical order and grouped according to type of organisation.

GOVERNMENT AND AGENCY	LOCAL AUTHORITY	SCIENTIFIC / RESEARCH / ACADEMIC
County Highways Departments	Aylesford Parish Council	CABI
Environment Agency	Ditton Parish Council	Zoological Society London
Association of Drainage Authorities (ADA) (South East) and Internal Drainage Boards	Dover / White Cliffs Countryside Partnership	KEW
Natural England	East Sussex Borough Council	Royal Holloway University
	Eastleigh Borough Council	University of Greenwich / Hadlow College
	Borough Country Parks	University of Kent
	Kent High Weald AONB Team	Canterbury Christchurch University
	Kent High Weald Countryside Partnership	St Mary's University
	Maidstone Borough Council	University College London
	North West Kent Countryside Partnership	Queen Mary, University of London
	Romney Marsh Countryside Partnership	Imperial College London
	Royal Tonbridge Wells Borough Council	Kings College London
	Swale Borough Council	Southampton University
	Stour Valley Countryside Partnership	Portsmouth University
	Tonbridge and Malling Borough Council	Plumpton College
	Yalding Parish Council	



CONSULTATION AND REGIONAL STAKEHOLDERS ...

RECREATIONAL AND VOLUNTARY
Angling Trust (The)
Aquatic Plant Society (The)
British Canoeing Association
British Paddle Boarding Association
Dartford District Angling and Preservation Society
Dover Sea Angling Association
Heron Angling Trust
Inland Waterways Association
Inshore Fishing and Coastal Association
Kingfishers Angling Association
Little Venice Marina
London Angling Trust
Luton Angling Club
Maidstone Victory Angling Association
MDL Marinas
Medway River Users Association
Paddock Wood Angling Society
Port Medway Marina
Premier Marinas
Pulborough Angling Society
Royal Horticultural Society
Royal Tunbridge Wells Angling Society
Royal Yachting Association (RYA)
Seaford Angling Club
Teise Angling and Preservation Society
Tonbridge & District Angling & Fish Pres' Society

RECREATIONAL AND VOLUNTARY
Carshalton & District Angling Society
Cranbrook & District Angling Club
Botanist / Pocock Herbarium Project
Bromley [Kent] & District Angling Society
Hassocks & District Angling Society Ltd
Holmesdale Angling and Conservation Society



Fig 6. American Signal Crayfish © GBNNSS

NON GOVERNMENT ORGANISATION AND PRIVATE
Colne Rivers Trust
East Malling Research Centre
Ebsford International
Farm and Wildlife Advisory Group (FWAG)
Greenspace Information for Greater London (GiGI)
Hampshire Biological Records Centre
Hampshire & Isle of Wight Wildlife Trust
Kent and Medway Biological Records Centre
Kent Wildlife Trust
London Invasive Species Initiative
London Wildlife Trust
Natural Enterprise
New Forest Non-Native Plants Project
Royal Society Protection of Birds (RSPB)
Rye Harbour Nature Reserve / Hastings
South East Rivers Trust
Surrey Wildlife Trust
Sussex Biological Records Centre
Thames 21
Wey Rivers Trust



CONSULTATION AND REGIONAL STAKEHOLDERS ...



INDUSTRY (MISC)
Belimited - INNS Independent Consultants
Complete Weed Control - INNS Specialist
Ebsford Int - INNS Independent Consultants
FCS Vegetation Care and Control - INNS Specialist
Forestry Commission
Network Rail South East
Property Care Association
Southern Water
South East Water
Thames Water
Affinity Water
Portsmouth Water
INDUSTRY (AQUACULTURE)
Aquaculture Stewardship Council
Kent and Essex IFCA
Sussex IFCA
Southern IFCA
Seasalter Shellfish (Whitstable Ltd)

INDUSTRY (PORTS)
Association of Port Health Authorities
Dover Port Health Authority
DR World Southampton
DP World London Gateway Port
DP World Southampton
Newhaven Port Authority
PD Ports (Isle of Wight and Thames)
Peel Ports London, Medway
Port of Dover
Port of London Authority
Port of Ramsgate
Portsmouth International Port
Shoreham Port (East Sussex)
Southampton Port Health Authority
Wighlink—Isle of Wight Ferries
Yarmouth IOW Ferry Terminal

INDUTRY (AIRPORTS AND ASSOCIATED STAKEHOLDERS)
Air Operators Association (The)
Brighton City Airport
Gatwick Airport
Goodwood Aerodrome
London (Ashford) Airport
Redhill Aerodrome
Southampton Airport



SECTION 4: SOUTH EAST RIMP - REGIONAL SITES OF HIGH CONSERVATION VALUE



To assist with the facilitation of resource direction and prioritisation of INNS management and in order to protect key sites of conservation value, the RIMPs outline some of the main conservation sites across their region.

There are a high number of designated sites across the region so for the purposes of this report, a selection from each catchment has been provided from the following designation types:

- Sites of Special Scientific Interest (SSSIs)
- Areas of Outstanding Natural Beauty (AONBs)
- Special Protection Areas (SPAs)
- Special Areas of Conservation (SACs)
- Ramsar Sites,
- NATURA 2000 sites
- Marine Conservation Zones (MCZs)

Cross referencing between the following table and the associated Management Priority Grids (either estuarine and coastal or freshwater) from pages 73 onwards are included in order to link to the INNS which threaten the site in question.

The following list offers a selection of sites of high conservation value from across the region. For a more comprehensive list or for further information on the designations and potential designations, please refer to [Natural England](#).

TABLE 2: REGIONAL SITES OF HIGH CONSERVATION

SITE	LOCATION	HABITAT	CATEGORY	INNS RISK (already present or nearby)
Dover to Deal	Kent	Marine - coastal (chalk)	Marine Conservation Zone	Orange tipped sea squirt, Pacific oyster, Darwin's barnacle
Dover to Folkestone	Kent	Marine - coastal (chalk)	Marine Conservation Zone	Orange tipped sea squirt, Pacific oyster, Darwin's barnacle
Thanet Coast	Kent	Marine – coastal (chalk)	Marine Conservation Zone / SPA / SAC / Ramsar Site / SSSI	Orange tipped sea squirt, Pacific oyster, Darwin's barnacle, carpet sea squirt, slipper limpet, brush-clawed shore crab
Medway Estuary	Kent	Marine - estuarine	Marine Conservation Zone / SPA / Ramsar Site / SSSI	Various, including; Giant hogweed, Japanese knotweed, Brush clawed shore crab, carpet sea squirt, Chinese mitten crab, Caspian mud shrimp,
The Swale Estuary	Kent	Marine - estuarine	Marine Conservation Zone / SPA / Ramsar Site / SSSI	Various including Asian shore crab, Chinese mitten crab, Pacific oyster, New Zealand pigmyweed
River Beult	Kent	Chalk Stream	SSSI	Water Fern, Floating Pennywort, Giant Hogweed and Himalayan balsam
Benfleet & Southend Marshes	Essex	Coastal –estuarine (cockleshell banks)	SPA/Ramsar Site	Various INNS which affect the SE TraC catchment (see pages 75 - 79)
Cornmill Stream and Old River Lea	Essex	Freshwater and riparian	SSSI	Designated due to its diversity in aquatic plants. These are at risk from a variety of INNS such as Himalayan balsam and Goldenrod in the Lee catchment and adjoining
Thames Estuary & Marshes	Essex/Kent	Coastal – estuarine (flooded chalk/gravel pits inside of sea wall)	SPA/Ramsar Site	Various INNS which affect the SE TraC catchment (see pages 75– 79)
Beachy Head East	East Sussex	Marine – coastal (chalk)	Marine Conservation Zone	Various INNS which affect the SE TraC catchment (see pages 75 - 79)
Offshore Brighton	East Sussex	Marine – coastal (deep water)	Marine Conservation Zone	Various INNS which affect the SE TraC catchment (see pages 75 - 79)

REGIONAL SITES OF HIGH CONSERVATION VALUE...

SITE	LOATION	HABITAT	CATEGORY	INNS RISK (already present or nearby)
Selsey Bill & the Hounds	West Sussex	Marine – coastal (peat/clay exposures & limestone)	(Proposed) Marine Conservation Zone	Various INNS which affect the SE TraC catchment (see pages 75 -79)
Kingmere	West Sussex	Marine – coastal (chalk, sandstone)	Marine Conservation Zone	Various INNS which affect the SE TraC catchment (see pages 75 - 79)
Dungeness, Romney Marsh & Rye Bay	Kent/East Sussex	Marine – coastal (wetland, shingle beaches, sand dunes)	SPA/Ramsar Site	Various INNS which affect the SE TraC catchment (see pages 75 - 79)
Chichester & Langstone Harbours	West Sussex	Marine – estuarine (sandflats, coastal lagoons, shingle ridges)	SPA/Ramsar Site	Various INNS which affect the SE TraC catchment (see pages 75 - 79)
Portsmouth Harbour	Hampshire	Marine – estuarine (shallow coastal waters, coastal lagoons)	SPA/Ramsar Site	Various INNS which affect the SE TraC catchment (see pages 75 - 79)
Solent & Southampton Water	Hampshire/Isle of Wight	Marine – coastal/estuarine (saline lagoons, shingle beaches, damp woodland)	SPA/Ramsar Site	Various INNS which affect the SE TraC catchment (see pages 75 - 79)
Colwell Bay SSSI	Isle of Wight	Coastal. Designated for cliff habitats and molluscan fauna	SSSI	American skunk cabbage, giant hogweed, Japanese knotweed, Terrapin species
Yar Estuary SSSI	Isle of Wight	Estuarine and saltmarsh	SSSI	American skunk cabbage. giant hogweed, Himalayan balsam
Freshwater Marshes SSSI	Isle of Wight	Fen	SSSI	Tall fen vegetation could be at risk from INNS reported on this Isle of Wight such as New Zealand pigmyweed,

REGIONAL SITES OF HIGH CONSERVATION VALUE...

SITE	LOCATION	HABITAT	CATEGORY	INNS RISK (already present or nearby)
Medina Estuary SSSI	Isle of Wight	Estuary / intertidal mudflats and saltmarsh habitat	SSSI	Various INNS which affect the SE TraC catchment (see pages 75 - 79)
Hythe to Calshot Marshes SSSI	Hampshire/ New Forest	Saltmarsh and mudflats	SSSI	Various INNS which affect the New Forest (see pages 80 - 84)
Lincegrove and Hackett's Marshes	Hampshire	Estuary and marsh habitats	SSSI	At risk from expansion of common cord grass and other species which affect the SE TraC water (see pages 75 - 79)
Lower Test Valley	Hampshire	Upper estuary from salt through brackish to freshwater conditions	SSSI	Various INNS which affect the Test and Itchen Catchment (see pages 80 - 84)
The New Forest	Hampshire	Lowland heath / mire / fen, riparian / bog woodland	Ramsar Site / SPA / SAC and SSSI	Various, especially non native plant species which affect the New Forest (see pages 80 - 84)
Lee Valley	Herefordshire	Reservoirs and former gravel pits. Freshwater	Ramsar Site / SPA	Various, especially those which affect London and the Lee catchment (see pages 80 - 84)
Rye Meads	Herefordshire	Floodplain meadows	SSSI	Various, especially those which affect London and the Lee catchment (see pages 80 - 84)
Chingford Reservoir	Greater London	Reservoir / freshwater	SSSI	Various INNS which affect the Lee catchment (see pages 80 - 84)
Mid Colne Valley	Greater London	Freshwater	SSSI	Various INNS which affect the Colne Catchment and Greater London (see pages 80 - 84)
Barn Elms Wetland Centre	Greater London	Freshwater / wetland habitats	SSSI	Various INNS which affect London and the Thames Trac (see pages 80 - 84)

REGIONAL SITES OF HIGH CONSERVATION VALUE...

SITE	LOCATION	HABITAT	CATEGORY	INNS RISK (already present or nearby)
Kent Downs	Surrey, Kent	Chalk and greensand hills / open countryside, agricultural land, and numerous waterbodies	Area of Outstanding Natural Beauty (AONB)	Various INNS which affect the catchments; Moles, Medway and Stour (see pages 80 - 84)
High Weald	Kent, Sussex and Surrey	Various: open countryside, agricultural land and numerous waterbodies	AONB	Various INNS which affect the Rother and Medway catchments (see pages 80 - 84)
South Downs	East Sussex	Various: cliffs, agricultural land, ancient woodland and lowland heath	AONB	Various INNS which affect East Hampshire, Arun and Western Streams, Adur and Ouse, Cuckmere and Pevensy and Rother catchments (see pages 80 - 84)
Chichester Harbour	West Sussex	Estuary / saltmarsh / mudflats	AONB	Various INNS which affect the SE TraC, Arun and Western Streams and East Hampshire Catchments (see pages 75 - 84)
Isle of Wight	Isle of Wight	Various: estuaries, cliffs, shore, open countryside, agricultural land and freshwater	AONB	Various INNS which have been introduced to the Isle of Wight as well as those which affect the SE Trac and the Solent (see pages 75 - 79)
The Chilterns	West Berkshire and Hertfordshire	Various: Woodland, agriculture and numerous waterbodies	AONB	Various INNS which affect the Colne and nearby London catchments (see pages 80 - 84) as well as those listed in the Midland RIMP for the Thames and



SECTION 5: REGIONAL HIGH RISK AREAS AND HOTSPOTS

In order to further assist with education and awareness raising and ensure the correct targeting of resources, the following lists some of the High Risk Areas in the region. High Risk Areas are sites where there is a higher risk of invasion due to an abundance of potential pathway activities taking place. This is not an exhaustive list. There are many more potential sites for the region but the following is a summary list to give examples of where education and awareness raising should be prioritised and to further highlight the potential pathways associated with IAS.

SITE	LOCATION	HABITAT	RISK ACTIVITIES	INNS RISK
Rib Valley Fishing Lakes	Ware	Freshwater Lakes; Rib Lake, Millennium Lake, and Westmill Lake	Fishing	Risk from a variety of INNS which could be transported into the region as contaminants on fishing equipment
Lee and Stort Navigation	Bishop Stortford	Riverine and riparian	Boating	Risk from a variety of INNS which could be transported into the region as contaminants on boats and associated equipment
Grand Union Canal	Grand Union Canal	Artificial canal waterbody	Boating	Various risk to the area of incoming INNS on boats and a risk of spreading INNS further up the system towards Birmingham
Queen Mother Reservoir	Queen Mother Reservoir	Reservoir	Sailing and boating activities	Various risks from INNS which could come into the area as contaminants on boats and equipment (see also Hotspots)

REGIONAL HIGH RISK AREAS...

SITE	LOCATION	HABITAT	RISK ACTIVITIES	IAS SPECIES RISK
Mercers Lake	Mercer Country Park, Redhill, Surrey	Freshwater lake	Water sports	Risk from a variety of INNS being transported on water sports equipment
Island Barn Reservoir	Island Barn Reservoir, West Molesey	Freshwater lake/reservoir	Water sports / sailing	As above and with the added risk of spreading floating pennywort
Yalding / River Medway	Yalding	Riverine and riparian	Boating	Spread of floating pennywort via fragmentation by boats
Royal Military Canal (RMC)	Rother Catchment in Sussex	Canal, freshwater and riparian habitats	Pleasure boating in the RMC	A variety of INNS could be brought into and/or spread from the canal to riverine system via attaching to boats and / or ballast
Wallers Haven	Pevensey	Drainage ditches and streams within the Pevensey Levels	Angling	Risk of introducing a variety of INNS which could contaminate angling equipment
Pevensey Haven	Pevensey	As above	As above	As above
Chilley Stream	Pevensey	As above	As above	As above
Raillands Ditch	Pevensey	As above	As above	As above

REGIONAL HIGH RISK AREAS...

SITE	LOCATION	HABITAT	RISK ACTIVITIES	IAS SPECIES RISK
Meon Springs	East Hampshire	Lakes, woodland, amenity grassland	Fly fishing and hiking	Risk of introducing freshwater aquatic INNS such as killer shrimp into the region as contaminants on fishing equipment.
River Itchen	Romsey	River Itchen	Angling	Various associated INNS could be transported in on contaminated equipment which would threaten the Test SSSI
River Medway Navigation and Canoe Trail	Tonbridge to Maidstone, Kent	Riverine and riparian	Canoeing and boating activities	Numerous canoe slipways where INNS could enter the catchment without good biosecurity procedures in place
Bowl Water	Near Lamberhurst, Kent	Freshwater reservoir with access trails and woodland.	Water sports, fishing, hiking and cycling	Various risks for a variety of INNS, especially those which can be transported into the region on water sports equipment.
Timsbury Fishing	Timsbury	River Test	Fishing	Various associated INNS could be transported in on contaminated equipment which would threaten the Test SSSI
Orchard lakes	New Milton	5 Lakes and adjacent amenity grassland with woodland	Fishing	Fresh water INNS being introduced via contaminated fishing tackle and equipment
Hordle Lakes	Hordle near New Milton	7 lakes with adjacent amenity grassland and woodland	Fishing	Fresh water INNS being introduced via contaminated fishing tackle and equipment

REGIONAL HIGH RISK AREAS...

SITE	LOCATION	HABITAT	RISK ACTIVITIES	IAS SPECIES RISK
River Medina	From Solent to Newport	Transitional, riverine and riparian	Boating	INNS may be introduced to the island via boats coming into the catchment at this point
Wootton Creek	Fishbourne to Wootton Bridge	Transitional, riverine and riparian	Boating and water sports	INNS may be introduced to the island via boats coming into the catchment at this point
Old Mill Pond	Wootton Bridge to Blackmill Brook	Riverine and riparian	Boating	INNS may be introduced to the island via boats coming into the catchment at this point
Alverstone Ponds	Corrie Bank, Alverstone	Freshwater ponds and adjacent woodland and grassland habitats	Fishing	INNS may be introduced to the island via contaminated fishing equipment



5B) TABLE 4 - REGIONAL HOTSPOTS

Hotspots are areas where there is already an abundance of a particular INNS or an established mixed of various INNS. As such (though not exclusively) species listed here are likely to be those which are categorised for long term management as they are already well established.

SITE	LOCATION	HABITAT	ASSOCIATED INNS	RISK ASSOCIATED
Medway Estuary	Kent	Marine - estuarine	Asian shore crab, Brush-clawed shore crab	Continue to spread across the estuary and additional sites, with potential to impact upon native shore crab species and mussels. Mitten crabs continue to migrate into the freshwater stretches of the Medway.
River Medway	Yalding, Kent	Freshwater / riparian	Giant hogweed, Himalayan balsam and floating pennywort	If left untreated, an abundance of plants here will increase a currently reduced population of this INNS in the Medway catchment (see Figure. 8 page 32)
St Clement's Reach of the Thames and Dartford Creek	Dartford, Kent	Intertidal soft sediments	Chinese mitten crabs	Hotspot - damage caused to the riverbanks by Chinese mitten crabs
Gravesend Reach and downstream of the Thames	East of Gravesend, Kent	Intertidal hard substrate	Pacific oysters	Presence of Pacific oysters
Thanet Coast	Thanet, Kent	Marine and coastal (chalk)	Pacific oyster, carpet sea squirt	Spread to additional sites. Limited numbers already being found at nearby locations, where previously unknown and impact upon native species, such as the blue mussel and create monoculture reefs. Potential to rapidly spread to additional sites. Can smother native species, posing a risk for fishing and shellfish industries.
The Solent	Hampshire	Marine and coastal	Slipper limpets, carpet sea squirt and wireweed	An abundance of marine and coastal INNS which can spread to other areas within the SE Trac and into the south west region.

REGIONAL HOTSPOTS...

SITE	LOCATION	HABITAT	ASSOCIATED INNS	RISK ASSOCIATED
River Colne	Sissinghurst and Cranbrook, Kent	Freshwater and riparian	Giant hogweed and Himalayan balsam	If left untreated, INNS in this location will spread into the nearby River Beult SSSI and further down the Medway catchment
Epple Bay, Thanet	Thanet, Kent	Coastal	Abundance of Pacific oysters	Spread of Pacific oysters
Ramsgate Western Under-cliffe	Ramsgate, Kent	Coastal	Abundance of Pacific oysters	Spread of Pacific oysters
Swalecliffe	Kent	Coastal	Pacific oysters, <i>Didemnum vexillum</i> , slipper limpets and <i>Sargassum muticum</i> .	A variety of INNS are present here which may spread from and further translocate around this coastal catchment.
Great Stour/Little Burton	Horsmonden, Kent	Freshwater / riparian	Giant hogweed, Himalayan balsam, Japanese knotweed	Potential for dispersal to high risk public area from where spreading into non-naturally connected river systems via public could result
River Teise	Horsmonden, Kent	Freshwater / riparian	Giant Hogweed, Himalayan balsam, Japanese knotweed	Potential for dispersal to high risk public area from where spreading into non-naturally connected river systems via public could result
Hoo Peninsula - Medway Swale Estuary	Kent	Marsh / saltmarsh / estuary	Water fern	Whist the species is not always evident, historically there has been an issue in the drainage ditches across the Hoo Peninsula with water fern (see Figure. 7 page 32). If not monitored this species threatens to reduce the diversity of the important waterways in this location, especially in partnership with grazing cattle in the area.



Figure. 7 Water fern in the North Kent marshes / Hoo peninsula /
Medway and Swale estuary location, Kent © MVCP 2017



Figure. 8 Giant hogweed near the river Medway, Kent
© MVCP 2018

REGIONAL HOTSPOTS...

SITE	LOCATION	HABITAT	ASSOCIATED INNS	RISK ASSOCIATED
River Brede/Forge Stream	Brede, East Sussex	Freshwater / riparian	Giant hogweed, Himalayan balsam, Japanese knotweed	Direct downstream connectivity with Brede levels and Dungeness, Romney Marsh and Rye Bay SSSI (9km)
Lower River Arun	Pulborough to Arundel West Sussex	Freshwater / riparian habitat and associated grazing marsh	Floating pennywort, New Zealand pigmyweed and American mink	Amberley wild brooks SAC/SPA at risk from pennywort and New Zealand pigmyweed in adjacent ditches and ponds. Native water vole population at risk from mink
Hammer stream	Milland and Chithurst West Sussex	Freshwater / riparian/ tributary of the Western Rother River	Giant hogweed, Himalayan balsam and Mink	Headwaters are a source of balsam which is spreading down the catchment
River Ouse	Between Barcombe Mills and Isfield Weir Betchworth and Brockham, Leatherhead Bridge. Sussex	Freshwater / riparian	Himalayan balsam	This species is dominant vegetation type and thus excludes indigenous vegetation.
River Mole	Surrey	Freshwater / riparian	Himalayan balsam and American mink	Himalayan balsam is the is dominant vegetation type and thus excludes indigenous vegetation. Mink are a threat to the waterfowl that are growing noticeably absent in the river corridor
Passford Water / Lymington River	New Forest	Network Rail land adjacent to riparian habitat	Himalayan balsam	Balsam is spreading along the railway line and seeds are spreading into the river and onto the riparian habitats close by
Queen Mother Reservoir	Berkshire	Reservoir	Quagga mussel	Various risks from INNS which could come into the area as contaminants on boats and equipment as well as this site posing a risk to others due to the presence of quagga mussel.



SECTION 6: INVASIVE NON-NATIVE SPECIES MANAGEMENT PRIORITIES



PREVENT SPECIES:

The highest priority is to prevent the introduction, spread and establishment of invasive species in the region. If species on the 'Prevent List' are discovered in the area they should be reported to [GB NNSS](#), even where control methods are not known and they should be considered for rapid response action and eradication where feasible. The following table (pages 35 - 44) highlights the **Prevent List** species identified for the South East Region. **These are species which are not present in the region and where prevention is the highest priority.** For the purposes of the Prevent List, both coastal, estuarine and freshwater species have been amalgamated to give an overarching list (in the other tables for the species which are present, coastal, estuarine and freshwater have been separated).

The Management Priority Grids for both coastal and estuarine (pages 75 - 79) and freshwater (pages 80 - 84), highlights the other species in the region which should be eradicated and controlled. Within these grid are some **Black List Species**. The Black List Species in the grids are those which do occur in the region already (and so are not included in the following Prevent List table), but they are only in some catchments and so have been included in the Management Priority Grids in order to prevent them spreading into other catchments/areas.

As mentioned on page 9, the focus of this RAPID LIFE RIMP is on aquatic habitats and associated species, as such some species might not be included in the following tables. Please see Appendix 1 for other, non aquatic species.

Prevent Table Information:

Species have been listed in the table in alphabetical order via common name. The symbol **!** indicates which species have 'alert status' assigned to them and where new sightings need to be reported. Unless otherwise stated, information in the following table rows is paraphrased from and credited to the source which has been hyperlinked for that given species. For the most part the information is from the Non Native Species Secretariat (NNSS) and their website is: www.nonnativespecies.org or CABI, and their website is: www.cabi.org

TABLE 5 - SOUTH EAST REGIONAL PREVENT LIST SPECIES...

SPECIES	RISK OF INTRO'	PATHWAYS	AREAS AFFECTED	IMPACTS	ID	MANAGEMENT AND INFORMATION
! African clawed toad <i>Xenopus laevis</i> !	Medium. Previous introductions in the South East region	Deliberate releases into the wild or escapes from laboratories	Lowland ponds	ECOLOGICAL. They are known to be vectors of chytridiomycosis which may be a threat to some native amphibians	Flattened body and head with small eyes positioned on top. They have brown-grey blotched bodies with white undersides, powerful hind legs with webbed clawed feet	For this species see the RAPID LIFE Management Toolkit - Alert Species information on the NNSS website
! American bullfrog <i>Lithobates catesbeianus</i> !	Medium	Introduced via the pet trade and then deliberately released and/or have escaped	Freshwater ponds and lakes	ECOLOGICAL. Has been implicated in the decline of smaller, native amphibian species elsewhere in the world. Can be a vector for the chytrid fungus which causes serious disease in some amphibians	Large size with obvious ear drum. Twice the length of the native common frog with loud, deep call. For more information see the species information sheet on the NNSS website	For this species see the RAPID LIFE Management Toolkit - Alert Species information on the NNSS website
Asian/Japanese oyster drill <i>Ocenebrellus inornatus</i>	Medium	Aquaculture	Intertidal on substrates of gravel, shell, sand and mud (usually associated with oyster beds)	ECONOMIC/ECOLOGICAL. Predates on oysters so a potential impact on aquaculture and further loss of European oysters. May predate on Pacific oyster however	See the species information on the NNSS website	See the species information on the NNSS website
Broadleaf rush <i>Juncus plarifolius</i>	Medium	Accidental/intentional introduction. Natural dispersal	Coastal, riverbanks	ECOLOGICAL. May out-compete and displace other flora	Perennial wetland rush plant. Tall stems and pink flowers forming in clusters around the apex of the branches	See the species information on the NNSS website and the species information on the CABI website

SOUTH EAST REGIONAL PREVENT LIST SPECIES...

SPECIES	RISK OF INTRO'	PATHWAYS	AREAS AFFECTED	IMPACTS	ID	MANAGEMENT AND INFORMATION
Cauliflower sponge <i>Celtodoryx ciocalyptoides</i>	Medium	Aquaculture	Rocky substrates, mussel shells and subtidal soft substrates in estuaries and marine habitats	ECONOMIC / ECOLOGICAL. Can smother a habitat and other species. Especially detrimental to bivalve stock and may impact aquaculture	Yellow or pale brown sponge. Initially a thinly encrusting sheet on a solid surface, but (in introduced range) may grow to very substantial globular or broadly attached forms up to 50 cm thick	No known management. See species information on the NNSS website for more information
Carolina water shield / Fanwort <i>Cabomba caroliniana</i>	High. Only a few recorded locations in GB but one, in the Basingstoke Canal, is close to the South East. May also be deliberately introduced or escape from aquaria	Releases or escapes from aquaria	Slow flowing / still waterbodies. In the UK it has occurred in canals	ECONOMICAL / ECOLOGICAL. Fanwort can form dense stands that can displace native species as well as clog up waterways and impede access and boating. It easily spreads via stem fragments which makes management difficult	Similar to other fanworts and parrots feather this aquatic perennial has opposite submerged leaves, floating leaves and solitary white emergent flowers	Unknown. See species information on the NNSS website
Flat bottom sea star / northern Pacific sea star <i>Asterias amurensis</i>	Low. Not currently close to the UK but has the potential to move long distances	Ballast water, aquaculture	Mud, sand or rocky areas in sheltered estuarine/marine habitats	ECONOMICAL / ECOLOGICAL. Can expand into very large populations in a very short space of time. Predates on mussels, clams and scallops so may affect aquaculture	Can grow up to 50cm in diameter. Yellow with red and purple pigmentation on its five arms, and a small central disk	Various including chemical and physical though prevention is key due to rapid expansion of species once established. See species information on the CABI website

SOUTH EAST REGIONAL PREVENT LIST SPECIES...

SPECIES	RISK OF INTRO'	PATHWAYS	AREAS AFFECTED	IMPACTS	ID	MANAGEMENT AND INFORMATION
Hottentot fig <i>Carpobrotus edulis</i>	Low. No current records for the SE region (nearest location Bournemouth) and unlikely to spread	Discarded garden material. Used to stabilise dunes	Commonly found in mild coastal areas (especially south-west England) on cliffs and dunes	ECOLOGICAL / ECONOMICAL. Mainly forms dense, impenetrable mats excluding other species. Out-competes native species and a single plant can occupy an area up to 50m across	Low growing with distinctive 3 angled succulent leaves and large yellow flowers that fade to pink	Mechanical and chemical control. See species information page on the NNSS website
Italian crested newt <i>Triturus carnifex</i>	Low. Only one or two known sites in the UK with slow natural dispersal	Wild populations originate from escapees or deliberately released pets	Still waters such as lakes and ponds but have been known to disperse along waterways	Hybridisation with great crested newts which will reduce the genetic stock of this already declining native species. May also be a vector for chytrid fungus which harms native amphibians	Very similar to a great crested newt though stockier and with smoother skin. Care needs to be taken due to hybridisation which will effect I.D.	Trapping and removal. For more information see the species Risk Assessment via NNSS
Japanese skeleton shrimp <i>Caprella mutica</i>	Medium. The species is currently along the north east coast of England but may naturally disperse towards the south east	Unknown, though likely to have originally been aquaculture, ballast water and hull fouling	In the UK it is known in biogenic reefs and is found on both natural material such as drifting macroalgae (seaweed) and on artificial holdings such as mooring ropes and buoys	ECONOMIC / ECOLOGICAL. May compete with native shrimp populations. High densities may block water intakes on pumps and settle on mussel lines. Economic costs associated with removal of fouling organisms and loss of utility may be incurred	Large skeleton shrimp up to 49 mm in length; males are larger than females. For more detailed information see the species information on the NNSS website	Good biosecurity (check, clean, dry) See species information on the NNSS website

SOUTH EAST REGIONAL PREVENT LIST SPECIES...

SPECIES	RISK OF INTRO'	PATHWAYS	AREAS AFFECTED	IMPACTS	ID	MANAGEMENT AND INFORMATION
Johnson grass <i>Sorghum halepense</i>	High. Likely via deliberate or accidental introduction and release of seeds	Deliberate introductions for cultivation as a food or fodder plant and accidental importation due to being a contaminant on other shipping	Along stream or canal banks	ECONOMIC / HUMAN HEALTH. Known as a pest species impacting on arable production and may poison cattle due to cyanic properties. Reports for the US and Australia also indicate it can reduce visibility when it grows along road verges and it can exacerbate hay fever	A perennial grass, extensively creeping growth form and covered with brown scale-like sheaths. See CABI Datasheet on the CABI website for more information	See CABI Datasheet on the CABI website for more information
Killer alga <i>Caulerpa taxifolia</i>	Medium	Escaping from aquaria and then dispersal via currents and fishing nets or other equipment	Mud, sand, rock and artificial substrates	ECOLOGICAL / ECONOMICAL. Meadows of killer alga can significantly alter habitat structure and species composition. It can become tangled in or swamp fishing equipment and also reduce foraging ability of fish species so may impact on industry	A bright green seaweed with upright fronds arising from creeping horizontal stems. The fronds are fern-like, serrate and feathery	See the RAPID LIFE Good Practice Management Guidance or the species information , both on the NNSS website
! Killer shrimp <i>Dikergammarus villosus</i> !	Medium. Some records from neighbouring regions	Dispersal through interconnecting waterways and via being a contaminant on equipment, in ship ballast and in sediment	Freshwater, though has a high salt tolerance so could occupy brackish areas	ECOLOGICAL / ECONOMICAL. So called due to its aggressive behaviour towards native invertebrate species. Due to its large body size and well developed mouthparts it is an effective predator which kills or simply bites off much more prey than it can consume (Dick et al., 2002)	Key ID feature is the presence of cone shaped protrusions on the tail. Larger than native freshwater shrimp species and sometimes with a striped appearance	Good biosecurity is essential; Check, Clean, Dry campaign and awareness raising. For more information see the RAPID LIFE Management Tool Kit 'Alert Species' and additional species information on the NNSS website. See also the species datasheet on the CABI website

SOUTH EAST REGIONAL PREVENT LIST SPECIES...

SPECIES	RISK OF INTRO'	PATHWAYS	AREAS AFFECTED	IMPACTS	ID	MANAGEMENT AND INFORMATION
Noble crayfish / European crayfish / broadfingered crayfish / <i>Astacus astacus</i>	Medium. In the UK but not widespread or close to the region	Various: Importation for pet trade and later deliberate release. Via purchase of live stock for consumption with later release. via their use as fishing bait and thus human transfer between waterbodies	Freshwater bodies	ECOLOGICAL / ECONOMIC. Could damage and undermine riverbanks via burrowing.	Dark brown or black on the dorsal side, and olive-brown on the ventral side. Claws robust. For more information see the RAPID LIFE Management Toolkit 'Alert Species' information on the NNSS website and the CABI datasheet on the CABI website	Good biosecurity is essential, see Check/Clean/Dry. For more information see the species Risk Assessment and the RAPID LIFE Management Toolkit 'Alert Species' information, both on the NNSS website and the CABI datasheet on the CABI website. Please note this species is rated as vulnerable on the IUCN Global Red List and that it is also listed as Annex 5 of the EU Habitats Directive so biosecurity over active control is needed.
Orange ripple bryozoan <i>Schizoporella japonica</i>	High-medium. No records for the SE region	Aquaculture. Ship/boat hull fouling	Primarily found in harbours and marinas on hard substrates	ECOLOGICAL / ECONOMICAL. Can compete with native species for space and food. Once established can become a significant fouler and smother native shellfish	Bright orange, red encrusted bryozoan which creates colonies. See the species datasheet on the CABI website for more information	Good biosecurity is essential. See the species factsheet and the RAPID INNS Management Toolkit: Marine Biosecurity Resources , both on the NNSS website Please note - hull cleaning in water is regarded as a deposit in the marine environment under the Marine Deposit Order. For information and guidance on hull cleaning please see The Green Blue and the RAPID pages

SOUTH EAST REGIONAL PREVENT LIST SPECIES...

SPECIES	RISK OF INTRO'	PATHWAYS	AREAS AFFECTED	IMPACTS	ID	MANAGEMENT AND INFORMATION
Raccoon <i>Procyon lotor</i>	Medium. Raccoons are not established in the UK yet but occasionally escape from collections. Some have been at large for up to four years and a female once gave birth to cubs in the wild. There is a risk that this species may become established and invasive, if releases continue	Pet trade, zoos and wildlife parks. Animals are illegally released or escape into the wild. ' <i>Countries should prohibit the importation of P. lotor, even if they are to remain in captivity, because many introductions have been accidental, such as in Japan</i> ' (Ikeda et al. 2004)	Various. They often climb trees and use nest holes but as they like to feed in water or to douse their food in water before eating they are associated with aquatic habitats	ECOLOGICAL / ECONOMICAL / HUMAN HEALTH. Animals may reduce and displace birds. They eat a wide variety of plant and animal based foods so may reduce resources for native species. They carry a roundworm parasite <i>Baylisascaris procyonis</i> that is highly pathogenic in humans, and may even be fatal and are also carriers of rabies and cause canine distemper and toxoplasmosis. They often raid rubbish bins and so will cause social and economic issues. The raiding of fruit crops will also result in economic losses	Grey and about the size of a large cat, with distinctive dark eye-patches / face mask and a thick furry tail which has a series of black rings	For more information see the species information sheet on the NNSS website or the species datasheet on the CABI website
Raccoon dog <i>Nyctereutes procyonoides</i>	Medium. This species is spreading westwards across continental Europe and has recently been recorded in the UK as an escapee. There was a report of a raccoon dog near Loch Lomond in the 1990s but the first confirmed sighting was in Berkshire in 2005	Deliberate introductions. Pet trade and deliberate releases or escapees	Wet woodland habitats, especially where there is abundant under-growth. They are typically found near water	ECOLOGICAL / HUMAN HEALTH / ECONOMICAL. They may compete for food and dens with native animals such as the red fox and badger and their predation on birds and amphibians may affect populations. They are carriers of diseases such as sarcoptic mange and tapeworms that can affect native mammals and are one of the main vectors of rabies in Europe. Treating them with oral rabies vaccinations has an economic cost	Fox sized. Lacks a facial mask. Small rounded ears, a pointed muzzle and long hair on the cheeks. Colour varies from yellow to grey or reddish. There are black hairs on the back, shoulders and tail. The legs, feet and chest are dark. Short legs and tail	See the species information page on the NNSS website or the species datasheet on the CABI website

SOUTH EAST REGIONAL PREVENT LIST SPECIES...

SPECIES	RISK OF IN-TRO'	PATHWAYS	AREAS AFFECTED	IMPACTS	ID	MANAGEMENT AND INFORMATION
Rayed pearl oyster <i>Pinctada imbricata radiata</i>	Medium. Currently around the Mediterranean where it is considered invasive. Risk may increase with rising water temperatures	Hull fouling. Marine litter and aquaculture	Rocks and submerged objects	ECOLOGICAL. Considered to be habitat modifying, forming oyster beds. No specific impacts yet identified for the UK		Shell is rather thin and compressed and can be uniform or with darker markings. It is generally brownish or reddish. For more information on its appearance see the CABI Datasheet on the CABI website
Red king crab <i>Paralithodes camtschaticus</i>	Medium. Present across other parts of Europe but natural dispersal is slow	Intentional introduction, natural spread and ballast water	Sandy/muddy substrates in deep water. Shoreward migration in winter/early spring	ECOLOGICAL / ECONOMICAL. A generalist predator which may impact on native biodiversity and exploit commercial seafood beds. They may indirectly transmit trypanosomes to cod by promoting an increase in associated leech vector (Hemmingsen et al., 2005)		Large crab with a fan like tail. Five appendages, the first two are pincers, and the right is larger than the left. Has an array of antennae and mouth parts. Red/brownish colour, though blue forms are also found
Rough agar weed / red algae / worm weed <i>Gracilaria vermiculophylla</i>	HIGH. Populations exist now in the south west region	Aquaculture, ballast water and hull fouling	In the UK it is often found as loose-lying or entangled plants in sheltered estuaries and bays with muddy sediments which are rich in nutrients	ECOLOGICAL / ECONOMICAL. Species forms algal mats which can extensively outcompete other species. Species may also damage nets and equipment, having an economical cost. May also increase biodiversity however by introducing structural complexity to soft-bottomed shores, which support grazers		Plants are dark-red to almost black. The plants are cartilaginous but branches can feel elastic due to the lower parts being hollow. The growth form can vary from bushy to long and straggly. For more I.D information see the species information on the NNSS website

SOUTH EAST REGIONAL PREVENT LIST SPECIES...

SPECIES	RISK OF INTRO'	PATHWAYS	AREAS AFFECTED	IMPACTS	ID	MANAGEMENT AND INFORMATION
Round goby <i>Neogobius melanostomus</i>	High. Found in the ponto-caspian region and may spread to the UK eastern Europe	Ballast water and hull fouling	Brackish or fresh-water bodies	ECONOMIC / ECOLOGICAL AND HUMAN HEALTH. Feeds on benthic organisms that are exposed to contaminated sediments. As they are preyed upon by commercial fishes the fish diet of humans is a concern (Corkum et al., 2004). May impact on the fishing industry and predate on native species. It's colonisation may be facilitated by zebra mussels which it will consume	Large for a goby, at around 25cm. Dark blotch at end of dorsal fin. See the 'fish' ID sheet via RAPID LIFE Management Toolkit - Alert Species information on the NNSS website	For this species see the RAPID LIFE Management Toolkit - Alert Species information on the NNSS website and/or See species information on the CABI website Please note - hull cleaning in water is regarded as a deposit in the marine environment under the Marine Deposit Order. For information and guidance on hull cleaning please see The Green Blue and the RAPID pages
Sacred ibis <i>Threskiornis aethiopicus</i>	Medium. Captive populations but no known breeding birds in the UK wild at the moment	Park escapees. Free flying in birds in parks has caused feral populations	Wide range of mainly inland habitats by lakes and rivers	ECOLOGICAL / HUMAN HEALTH AND ECONOMICAL. Predator of young birds and will take birds eggs and young. May have an impact on native water birds and can outcompete other species for nest sites. Their large size represents a bird-aircraft strike hazard	A distinctive large wading bird with a long, down-curved bill, white body, black head and neck and long black legs	For this species see the RAPID LIFE Management Toolkit - Alert Species information on the NNSS website

SOUTH EAST REGIONAL PREVENT LIST SPECIES...

SPECIES	RISK OF INTRO'	PATHWAYS	AREAS AFFECTED	IMPACTS	ID	MANAGEMENT AND INFORMATION
<p>! Topmouth gudgeon <i>Pseudorasbora parva</i> !</p>	<p>Medium. Previous wide scale eradication programmes have been carried out but if introduced the species could spread rapidly</p>	<p>Deliberate introductions for aquarium, gardens or as live bait. Contaminants within fish consignments and accidental transfer as contaminants on angling equipment</p>	<p>Freshwater habitats</p>	<p>ECOLOGICAL / ECONOMICAL. Competes for food with native and farmed fish species and competition for space and spawning habitat, especially where it is abundant. Direct impacts via predation on invertebrates and fish fry/eggs. It is also classed as a facultative parasite, with some evidence to suggest it impedes the reproduction of other species (Britton <i>et al.</i> 2007, 2008)</p>	<p>Small slender fish with dark eyes. This species lacks a barbell. For more information see the RAPID LIFE Management Toolkit - Alert Species and the species Risk Assessment, both on the NNSS website</p>	<p>For this species see the RAPID LIFE Management Toolkit - Alert Species and the species Risk Assessment, both on the NNSS website</p>
<p>Veined rapa whelk <i>Rapana venosa</i></p>	<p>Medium. Likely to continue to expand its range, facilitated by ocean traffic and ballast water</p>	<p>Aquaculture, ballast water and deliberate introductions for the seafood trade</p>	<p>Soft sediment, occasionally hard surfaces</p>	<p>ECOLOGICAL / ECONOMICAL. Heavily predated on oysters and mussels so will impact on native biodiversity and shellfish industry and will outcompete native whelks</p>	<p>Heavy spherical shell with a large inflated body whorl. For more information see the CABI Datsheet on the CABI website</p>	<p>Unknown. Good biosecurity needed. For more information see the CABI Datsheet on the CABI website</p>
<p>White river crayfish <i>Procambarus acutus acutus</i></p>	<p>Low. Present in the UK but only at one site near Windsor (Midlands region)</p>	<p>Importation of animals for consumption and/or the aquarium trade. Natural dispersal amongst water-bodies is likely but slow</p>	<p>Freshwater bodies such as rivers and streams</p>	<p>ECOLOGICAL / ECONOMICAL. Potential negative impacts on native white-clawed crayfish. May damage riverbanks through burrowing, impacting on flood defences</p>	<p>Dark red with black wedge on abdomen. Claws slender. Can reach 11cm in length and ranges from pink, tan to olive in colour</p>	<p>For more information see the RAPID LIFE Management Toolkit 'Alert Species' information and the species Risk Assessment both on the NNSS website</p>



Species Information:

The following tables give information for the remaining species included for the South East RIMP. Unlike the Prevent List, the species in the following information tables and in the corresponding Management Priority Grids are those which are already present, in full or part of the region.

Table 6 (pages 45 - 56) gives information for the species which are **COASTAL AND ESTUARINE**. Table 7 (pages 57 - 72), gives information for species which are found in **FRESHWATER** habitats. Some species, such as Chinese mitten crab, may overlap and appear in both tables.

The following tables give species information (in alphabetic order by common name). The Management Priority Grids indicate the management priority for a given catchment. Cross reference between these information tables and the two Management Priority Grids (again one for coastal and estuarine (pages 75 - 79) and one for freshwater, (pages 80 - 84) in order to know the best approach and priorities for the species relating to a specific management catchment/area.

Where available, information and links to Good Practice Guidance and species Risk Assessments is included.

Please note, as the RAPID LIFE RIMPs prioritise aquatic habitats, species which inhabit other environments are not included in this section but appear in a species grid in Appendix 2 (pages 90 - 92).

Unless otherwise stated, information in the following table rows is paraphrased from and credited to the source which has been hyperlinked for that given species. For the most part the information is from the Non Native Species Secretariat (NNSS) and there website is:

www.nonnativespecies.org or CABI, and their website is: www.cabi.org

TABLE 6: COASTAL AND ESTUARINE - INVASIVE ALIEN SPECIES MANAGEMENT PRIORITIES...

Species Common Name	Scientific name	Risk of Intro	Pathways	Areas Affected	Impacts	Identification	Management / Good Practice Guidance	Notes on more Information
! American lobster !	<i>Homarus americanus</i>	Medium. Some records and sightings in the south east but no recorded established colonises as yet	Biofouling. Catering stock discard. Natural dispersal and via deliberate releases via religious groups	Potentially this species can occupy inshore and offshore locations, inhabiting bedrock, mud, clay, cobble, eel-grass beds, peat reefs and sandy depressions in its native range	ECOLOGICAL / ECONOMICAL. Could outcompete native lobsters for habitats and resources. Is a vector for disease which could heavily impact native lobsters and it can also hybridise with native lobsters. Due to threats to native lobsters there is a threat to UK commercial fisheries	A clawed lobster similar to native European lobsters, but larger with dark blue/green to green/brown body colour, red tint on claws and body, and green tint on walking legs	Trapping and removal	See the species information page on the NNSS website
American oyster drill	<i>Urosalpinx cinerea</i>	Low. Current distribution is limited to the Essex and Kent coasts. Natural dispersal can occur but at a slow rate	Now established in Essex and Kent their dispersal will be natural but, with no free swimming stage in its life history, natural dispersal is slow and occurs only on a local scale	Lower shore and shallow subtidal waters of estuarine and marine habitats and preferring muddy substrata	ECOLOGICAL / ECONOMICAL. The American oyster drill preys heavily on native oysters and may compete with native molluscs such as the dog whelk <i>Nucella lapillus</i> . Lacking a free swimming larval phase, local populations increase rapidly as dispersal is limited	Yellowish, orange or grey in colour, sometimes with irregular brown marks. The aperture is oval with an open canal at the base	Unknown	See the species information sheet on the NNSS website

COASTAL AND ESTUARINE - INVASIVE ALIEN SPECIES MANAGEMENT PRIORITIES...

Species Common Name	Scientific name	Risk of Intro	Pathways	Areas Affected	Impacts	Identification	Management / Good Practice Guidance	Notes on more Information
American piddock	<i>Petricolaria pholadiformis</i>	High. Present along south and east coasts of England and most common off the coast of Essex and the Thames estuary (River Medway)	Originally deliberately introduced. Now the pelagic larva results in natural spread and it may also spread via driftwood	Coastal and estuarine locations. Usually bores into clay, peat or soft rock shores	ECOLOGICAL. May displace native piddocks and this has been documented in other European countries although data on native piddock displacement is not confirmed in the UK	Elongated white shell that is thin, brittle and similar in shape and sculpturing on both sides	Unknown	For more information: MarLIN (The Marine Life Information Network)
American razor clam	<i>Ensis directus (americanus)</i>	Medium. Well established populations across catchment (Southend to Sandwich Bay). Limited records for Sussex	Ballast water. Natural dispersal of larvae	Sandy/ muddy bottoms along intertidal/ subtidal zone	Unknown, though can be a nuisance for beach users	See species information page on the MarLIN website for detailed description and photos	Mechanical removal of dead shells. Control of fishing licences	See the species datasheet on the CABI website and species information page on the MarLIN website for detailed description and photos
American sand gaper	<i>Mya arenaria</i>	Well established populations across the catchment (Thames/Medway Estuary, north Kent coast and Portsmouth to Southampton including the Isle of Wight)	Deliberate introduction. Natural dispersal of larvae	Intertidal/ shallow subtidal areas, preferring sand or sandy mud	Unknown	Large bivalve with a fawn/dirty white shell. Can grow up to 15cm in length	Unknown	See species information page on the MarLIN website for more information

COASTAL AND ESTUARINE - INVASIVE ALIEN SPECIES MANAGEMENT PRIORITIES...

Species Common Name	Scientific name	Risk of Intro	Pathways	Areas Affected	Impacts	Identification	Management / Good Practice Guidance	Notes on more Information
Brush clawed crab	<i>Hemigrapsus takanoi</i>	High. Already recorded at a number of sites in the South East though it is not currently widespread or thought to be spreading	Originally introduced via discharge of ships ballast water. It may extend its range via dispersal by water currents but dispersal is not known yet for the South East	Lower intertidal shores. Recorded in rock pools	ECOLOGICAL / ECONOMICAL Significant reductions in common shore crab abundance and mussel density have been reported where the Asian shore crab has achieved high densities in mainland Europe	A small crab with a square shell up to 4.5 cm, variable in colour from orange-brown to greenish-black. Three distinct 'teeth' on each side of the shell and banding on the walking legs are distinguishing features	Physical control and removal	See species information on the NNSS website
Australasian (Darwin's) barnacle	<i>Austrominius modestus</i>	High. Widespread around the UK and throughout the South East region in coastal habitats	Originally arriving via being attached to the hulls of ship, the species spread rapidly due to pelagic larval dispersal and further transport by hull fouling	Mid-shore to shallow subtidal areas of estuarine and sheltered marine habitats. It attaches to a variety of substrates including rocks, stones, hard-shelled animals and artificial structures	ECOLOGICAL / ECONOMICAL. Competes with native species for space and appears to have entirely displaced native barnacle species in some places. Economic impacts via fouling of vessels and equipment	A small sessile barnacle characterised by having four shell plates. Young specimens are white and smooth; adults are greyish brown and usually eroded	Physical control. Please note - hull cleaning in water is regarded as a deposit in the marine environment under the Marine Deposit Order. For information and guidance on hull cleaning please see The Green Blue and the RAPID pages	This species has become the dominant barnacle in a number of locations around the country. See the species information on the NNSS website

COASTAL AND ESTUARINE - INVASIVE ALIEN SPECIES MANAGEMENT PRIORITIES...



Species Common Name	Scientific name	Risk of Intro	Pathways	Areas Affected	Impacts	Identification	Management / Good Practice Guidance	Notes on more Information
Brush clawed crab	<i>Hemigrapsus takanoi</i>	High. Already present in the region though not widespread. Natural dispersal via larval forms	Introduced in their larval form via discharge of ballast water. Natural range expansion occurs when pelagic larvae are dispersed.	Shorelines and estuarine locations	ECOLOGICAL. Can outcompete and reduce populations of native shore crabs	A small crab with square shell up to 25 mm wide; three lateral spines on each side. Variable colour, spots on body and pincers	Physical control and removal	See species information page on the NNSS website
! Carpet sea squirt !	<i>Didemnum vexillum</i>	High	Hull fouling, mainly due to association with marinas	Marinas (man-made structures), rocks, cobble or gravel seabed	ECOLOGICAL. Capable of forming very large colonies, likely to have considerable effect on pre-existing sessile hard-surface communities	Uniform pale orange, cream or off-white in colour, with a firm leathery texture. It has a veined marbled appearance with numerous open small pores, which close up out of water. It can grow either as thin sheets or hang down in long rope-like growths	Unknown. Natural England recommend, if found in small patches, affected structures be removed from water. If intertidal, scraping to be considered. See species information page on the NNSS website. Hull cleaning in water is regarded as a deposit in the marine environment under the Marine Deposit Order. See The Green Blue and the RAP-ID pages	See species information page on the NNSS website and the Alert Page
Caspian mud shrimp	<i>Chelicorophium curvispinum</i>	High. Previously recorded and records indicate it is already in the region	Via ship ballast water/sediment. Once in an area they naturally migrate and disperse	Freshwater/brackish waters where it inhabits rocks, wood, submerged vegetation and bivalve shells	ECOLOGICAL/ECONOMICAL: High densities of filter feeders become primary consumers. Alters ecosystems via construction of 'mud tubes'	See species datasheet on the CABI website	See species datasheet on the CABI website	See species datasheet on the CABI website

COASTAL AND ESTUARINE - INVASIVE ALIEN SPECIES MANAGEMENT PRIORITIES...

Species Common Name	Scientific name	Risk of Intro	Pathways	Areas Affected	Impacts	Identification	Management / Good Practice Guidance	Notes on more Information
! Chinese mitten crab !	<i>Eriocheir sinensis</i>	High. Already abundant in some catchments (such as the Medway)	Originally introduced via ballast water, individuals will naturally migrate between freshwater and brackish environments	Early stages are found in lower estuarine areas with saline conditions. Adults are usually found in fresh or brackish waters in rivers. Muddy banks are required to provide habitat to burrow into for protection	ECOLOGICAL AND ECONOMIC. Likely to impact native, benthic invertebrate populations in freshwater and marine systems, through predation and competition for space. Has the potential to outcompete the native white-clawed crayfish. May cause siltation of gravel runs used for spawning by salmon and trout. Economic costs via riverbank damage and repairing flood defences	A large crab with a square shaped carapace which has four teeth on each side. Olive green in colour with paler legs, which are twice the length of the body. Obvious feature is the dense mat of hair on the claws. The leading edges of the legs are also very hairy	Unknown	For more information please see the species information on the NNSS website
Common cord grass	<i>Spartina anglica</i>	High. Already present around much of the South East region though not considered a priority. Naturalised species due to hybridization with native <i>Spartina</i>	Natural dispersal exacerbated by translocation for restoration works	Coastal and estuarine habitats	Naturalised species due to hybridization with native <i>Spartina</i> . Not a high priority for management	A deep rooted perennial, with green to grey-green sharp leaves that overlap. Stems reach heights between 30cm and 130cm. Colourless flowers	Bio-control (current research being undertaken - planthoppers). Chemical. Rot-burying. See the species datasheet on the CABI website	See the species datasheet on the CABI website

COASTAL AND ESTUARINE - INVASIVE ALIEN SPECIES MANAGEMENT PRIORITIES...

Species Common Name	Scientific name	Risk of Intro	Pathways	Areas Affected	Impacts	Identification	Management / Good Practice Guidance	Notes on more Information
Devils tongue weed	<i>Grateloupia turuturu</i>	High-medium	Aquaculture, hull fouling, drift (fertile blades)	Sheltered areas (pontoons, harbour walls, shells and stones) and lower shore in pools. Tolerates low salinities	ECOLOGICAL. Has the potential to displace native seaweeds due to size and high reproductive rate	A large red seaweed (deep red to purple), sometimes turning brown in summer. 1-6 elongated lance-like blades, up to 15cm wide and 1m long	Good practise biosecurity. See Check Clean Dry and the RAPID LIFE Management Toolkit on the NNSS website, Hand removal	See species information page on the NNSS website
Green Sea Fingers	<i>Codium fragile subsp. Fragile</i>	High	Natural dispersal and hull fouling	Mainly protected bays/estuaries. Open rock from mid to low shore	ECOLOGICAL / ECONOMICAL. Potential to displace native seaweed and become the dominant canopy species, consequently altering community structure/composition. In high densities it can be a fouling nuisance to shellfish beds. It also fouls boats, fishing nets, wharf pilings and jetties and economic losses may be incurred through cleaning costs, loss of utility and impacts on industry	Green seaweed with Y-shaped, branching fronds which have a felt-like texture. It has a disc-shaped holdfast. Can be distinguished from native <i>Codium tomentosum</i> by microscopic examination	Good practise biosecurity. See Check Clean Dry and the RAPID LIFE Management Toolkit on the NNSS website, Hand removal	See species information page on the NNSS website
Harpoon Weed	<i>Asparagopsis armata</i>	Medium. Widespread in south west but only found around the Isle of Wight and west Sussex coast in the south east	Aquaculture. Drift/rafting	Deep water tidal pools and shallow subtidal waters on a range of substrates	ECOLOGICAL / ECONOMICAL. In some locations, can dominate algal assemblages and when occurring in bloom-like outbreaks, can clog fishing gear	Has two morphologically different phases. Gametophyte plant is rosy, or yellowish/whitish pink. The tetrasporophyte plant is rosy pink. See species information on the MarLIN website	Good practise biosecurity. See Check Clean Dry and the RAPID LIFE Management Toolkit on the NNSS website, Hand removal	See species information on the MarLIN website

COASTAL AND ESTUARINE - INVASIVE ALIEN SPECIES MANAGEMENT PRIORITIES...

Species Common Name	Scientific name	Risk of Intro	Pathways	Areas Affected	Impacts	Identification	Management / Good Practice Guidance	Notes on more Information
Manila (Japanese carpet shell) clam	<i>Ruditapes philippinarum</i>	Medium. Well established populations across catchment (north Kent - Thames estuary to Thanet Coast)	Natural dispersal (coastal currents)	Harbours. Sand/ muddy gravel sediments in the intertidal and upper sublittoral zones	ECOLOGICAL / ECONOMICAL. Large numbers may result in a sharp reduction of all other filter feeding bivalves	Up to 6cm in length, varying in colour (white / grey / yellow, buff), with distinctive black and white markings	Unknown	See species datasheet on the CABI website
Leathery sea squirt	<i>Styela clava</i>	Medium. Found across much of the SE region, particularly in north Kent and the south coast between Brighton and Southampton	Hull fouling	Hard substrates in shallow water (such as marinas/ harbours)	ECOLOGICAL / ECONOMICAL. Can compete with mussels/ oysters for food and foul ships, moorings and buoys	Solitary. Brown in colour and up to 20cm in length. Siphons show dark brown strips when open	Hand removal. Killed by changes in salinity, temperature and exposure to air	See the species information page on the NNSS website
Orange cloak sea squirt	<i>Botrylloides violaceus</i>	Medium. Currently found across the SE (Kent to Hampshire) region in limited numbers	Aquaculture	Primarily harbours and marinas (pontoons, ropes etc), but also sheltered natural shores (on seaweed) along with other solid substrates	ECOLOGICAL / ECONOMICAL. Can smother other fauna and some evidence suggest that it can displace native species. Can clog gear and block boat inlet pipes	Forms gelatinous sheets/cushions, up to 15cm across, with each colony being a single colour (orange, violet, red, pink or yellow)	Mechanical clearance or biocide treatment, where well established	See species information page on the NNSS website

COASTAL AND ESTUARINE - INVASIVE ALIEN SPECIES MANAGEMENT PRIORITIES...



Species Common Name	Scientific name	Risk of Intro	Pathways	Areas Affected	Impacts	Identification	Management / Good Practice Guidance	Notes on more Information
Orange-tipped sea squirt	<i>Corella eumyota</i>	High. Wide-spread	Aquaculture (importation of commercial bivalves). Hull fouling (especially leisure craft)	Hard substrates, such as cobbles, rocks, ship hulls or shells of mussels and oysters	ECOLOGICAL / ECONOMIC. May have a negative effect on the abundance/habitat occupancy of other shallow water suspension feeding sessile invertebrates. Could become a serious fouler of mussel/oyster culture gear	2-4cm in length. Solitary, but can often form aggregations that foul the underlying substrata. Varies in colour from clear to brown with various shades of orange	Manual removal	See species information page on the NNSS website
Oyster Thief	<i>Colpomenia peregrina</i>	Medium. Found across the SE region, although only recorded once in Kent and east Sussex	Natural migration from France where it had been imported with American oysters. May have also been introduced from France on commercial oysters	Rocks, seaweed and shells	ECOLOGICAL. Negligible effects recorded. As it is fast growing though, it may have the potential to smother other species/cover areas of the shore	Greenish-olive non-gelatinous alga, between 1-7cm in diameter. See species information page on the MarLIN website	Unknown	See species information page on the MarLIN website
Pacific oyster	<i>Magallana gigas</i>	High. With well established populations across Thanet (Stour catchment) in Kent	Aquaculture	Hard substrate, including rocks, shells and man-made structures	ECOLOGICAL / ECONOMIC. Loss of mussel/other bivalve fisheries. Reef formation may impact upon human leisure activities	Variable in both size (up to 30cm) and shape (usually teardrop). Off white, yellowish or blue-grey in colour. Right valve deeply cupped, with several bold ribs. See Figure. 13 page 73	Removal by breaking hinge and removing upper valve. This method has been approved by Natural England to protect valuable habitat such as chalk substrate and wildlife such as shore crabs and tiny mussels often found under oysters.	See species information on the NNSS website. See also the Guardians of the Deep project page for information on control in Thanet

COASTAL AND ESTUARINE - INVASIVE ALIEN SPECIES MANAGEMENT PRIORITIES...

Species Common Name	Scientific name	Risk of Intro	Pathways	Areas Affected	Impacts	Identification	Management / Good Practice Guidance	Notes on more Information
Pom-Pom weed	<i>Caulacanthus okamurae</i>	High. Fast spreading. Currently limited to Kent (Thanet coast) and east Sussex in the SE region	Hull fouling	Occupies the mid to low shore	ECOLOGICAL. Turf formation can alter local habitat, displacing macro-invertebrates	Small red seaweed that forms dense springy clumps, with distinctive thorn-like forked side branches. See Identification Guide on the Marine Biological Association website	Unknown	See Identification Guide on the Marine Biological Association website
Red ripple bryozoan	<i>Watersipora subatra</i>	Medium. Limited records for the SE region, but anecdotal evidence suggest it may be widespread	Hull fouling. Aquaculture	Mainly hard surfaces in shallow water (marinas, harbours), but recently also on boulders on natural shores	ECOLOGICAL / ECONOMICAL. Large colonies can impact negatively on existing sessile communities. Can become dominant fouling species. Copper tolerant and therefore unaffected by many anti-fouling treatments	A bryozoan forming orange-red colonies. Sometimes dark sepia, blackish or deep purple. Individuals elongate, each with rounded, blackish spot (the operculum) at far end	Unknown	See species information page on the NNSS website
Ruby bryozoan / erect bryozoan	<i>Bugula neritina</i>	High -medium. Reasonably widespread across the SE region	Hull fouling	Hard substrates including ships hulls, docks and buoys	ECOLOGICAL / ECONOMICAL. A significant fouling organism. Can form dense colonies and impact on native species	See species information page on the MarLIN website	See species information page on the MarLIN website	See species information page on the MarLIN website

COASTAL AND ESTUARINE - INVASIVE ALIEN SPECIES MANAGEMENT PRIORITIES...

Species Common Name	Scientific name	Risk of Intro	Pathways	Areas Affected	Impacts	Identification	Management / Good Practice Guidance	Notes on more Information
San Diego sea squirt	<i>Botrylloides diegensis</i>	Medium. Found throughout the region (principally the Solent area and Brighton)	Hull fouling. Aquaculture	Shallow water in marinas/harbours	ECOLOGICAL. Large colonies can impact negatively on existing sessile communities	Colonies form gelatinous sheets/cushions and can be a single colour (usually orange). See ID guide on the MBA website	See ID guide on the MBA website	Difficult to distinguish between native <i>Botrylloides leachii</i> and non-native <i>Botrylloides violaceus</i> . See ID guide on the MBA website .
Slipper limpet	<i>Crepidula fornicata</i>	High. Very well established populations all across catchment	Mariculture, ballast water, hull fouling and floating wood	Most abundant in muddy seabed's, with hard shells and cobbles. Prefers sheltered areas such as inlets, bays and estuaries	ECOLOGICAL. Competes with native species for space/food	Shell is oval and up to 5 cm long. The shell opening has a shelf extending half its length. Shell is smooth and white, cream, yellow or pinkish in colour with streaks or blotches of red or brown. Commonly found in curved chains or stacks made up of several individuals	Dipping infested cultch/oysters into saturated sources of brine. Large beds can be dredged above high tide mark	See species information page on the NNSS website
Tufty-buff bryozoan	<i>Tricellaria inopinata</i>	Medium	Hull fouling. Aquaculture	Shallow water especially in marinas/harbours on hard surfaces (hulls, buoys)	ECOLOGICAL / ECONOMIC. A significant fouling organism. Can form dense colonies and impact on native species	Flexible, pale brown or pinkish-brown, erect colonies up to about 4 cm high and attached at base by root-like rhizoids. See species information page on the NNSS website for more information	Unknown. See species information page on the NNSS website	See species information page on the NNSS website

COASTAL AND ESTUARINE - INVASIVE ALIEN SPECIES MANAGEMENT PRIORITIES...

Species Common Name	Scientific name	Risk of Intro	Pathways	Areas Affected	Impacts	Identification	Management / Good Practice Guidance	Notes on more Information
Tree Groundsel	<i>Baccharis halimifolia</i>	Low. One record for the SE region in Hampshire at the edge of the catchment, where it grows on compacted sandy soils	Seed dispersal. Deliberate planting	Coastal wetlands, saltmarsh and woodlands	ECOLOGICAL / HUMAN HEALTH. Has capacity to form a dense understory, suppressing native species and altering local habitat/ecosystem. Toxic to livestock and can cause allergic reactions to humans	Fast growing deciduous shrub (up to 6m), tolerant of saltwater	See species datasheet on the CABI website for information	See species datasheet on the CABI website for information
Trumpet tube worm (fanworm)	<i>Ficopomatus enigmaticus</i>	High. Limited records for SE region but found in high numbers around the Solent	Hull fouling	Brackish water. Ports, marinas, harbours	ECOLOGICAL / ECONOMIC. Possibly beneficial (research suggests improved water quality). A significant fouling organism	See species datasheet on the CABI website	See species datasheet on the CABI website	See species datasheet on the CABI website
Wakame (Japanese kelp)	<i>Undaria pinnatifida</i>	High. Found all around SE catchment	Hull fouling. Aquaculture	Subtidal/very low intertidal. Pontoons, ropes, boat hulls, navigation buoys	ECOLOGICAL. Likely to compete with other seaweeds for space resource	A large brown seaweed (1m-3m in length) with branched holdfast and a wavy edged stalk. Flat broad blade with wavy edges	Manual removal	See species information page on the MarLIN website and the species datasheet on the CABI website

COASTAL AND ESTUARINE - INVASIVE ALIEN SPECIES MANAGEMENT PRIORITIES...

Species Common Name	Scientific name	Risk of Intro	Pathways	Areas Affected	Impacts	Identification	Management / Good Practice Guidance	Notes on more Information
Wireweed	<i>Sargassum muticum</i>	All across SE catchment. Hotspots are Thanet coast, Brighton, Portsmouth, Southampton and the Isle of Wight	Hull fouling, aquaculture, natural dispersal (floating fragments)	Intertidal/subtidal areas, particularly in rock-pools and hard surfaces. Coastal and estuarine	ECOLOGICAL. Outcompetes native seaweed species. Fouls commercial oyster beds/ fishing gear. Can impair recreational activities	Large (up to 1m) olive-brown seaweed. Wiry stem with alternating small oval blades and spherical bladders. Lateral branches hang like a washing line when held	Manual removal. Trawling, cutting and suction. No permanent method of removal found. See Figure 9 below	See species information page on the NNSS website



Figure. 9. Wireweed © SNH 2009

TABLE 7: FRESHWATER - INVASIVE ALIEN SPECIES MANAGEMENT PRIORITIES...

Species Common Name	Scientific name	Risk of Intro	Pathways	Areas Affected	Impacts	Identification	Management / Good Practice Guidance	Notes on more Information
Alpine newt	<i>Mesotriton alpestris</i>	Medium. Already established at various sites in the region	Deliberate introductions in attempt to establish breeding colonies and facilitate spread. Natural dispersal is likely but would be slow without assistance	Ponds but will live in wetlands and slow flowing freshwater	ECOLOGICAL. A vector for Chytridiomycosis and potentially a vector of the amphibian fungal pathogen <i>Batrachochytrium dendrobatidis</i> (Bd). Both these pathogens affect naïve amphibians	A medium-sized newt. Males blue-black with spotted flanks, females less colourful with grey marbling on flanks, back and tail	Trapping and removal as and where it is undertaken	See species information page on the NNSS website
American mink	<i>Neovison vison</i>	High. Found throughout the UK and the south east	Following original deliberate and accidental releases from Mink Farms, the species now spreads along rivers and through waterbodies naturally	American mink hunt mostly in water and are most frequently seen in rivers or lakes, or at the coast. They also occur in a wide range of wooded or scrubby habitats, not necessarily near water	ECOLOGICAL. Impact on native species via predation, competition, and potentially also by acting as a vector of disease. Significant population declines of ground-nesting birds and small mammals such as Water Vole	Usually dark brown fur and often a white patch on the chin. It is a generalist and opportunist predator with a variable diet that includes aquatic, semi-aquatic and terrestrial prey	See the RAPID LIFE Good Practice Management Guidance on the NNSS website	See Species Information page on the NNSS website
American skunk cabbage	<i>Lysichiton americanus</i>	High. Widespread across the region but not generally common. Risk is high due to availability and natural dispersal from unknown colonies	Skunk cabbage is widely planted in bog gardens from which it escapes. Via berries being transported downstream it can spread rapidly from the point of introduction	Carr, muddy pond margins, stream and riversides	ECOLOGICAL. Can form dense stands and can thus significantly decrease native vegetation	Resembling wild arum (lords-and-ladies) but much larger. Emits a strong odour like that of skunk. The plant has a basal rosette of and yellow flower spathe	See the RAPID LIFE Good Practice Management Guidance on the NNSS website	See species information pages on the Non Native Species Secretariat website

FRESHWATER - INVASIVE ALIEN SPECIES MANAGEMENT PRIORITIES...

Species Common Name	Scientific name	Risk of Intro	Pathways	Areas Affected	Impacts	Identification	Management / Good Practice Guidance	Notes on ore Information
Bar-headed goose	<i>Anser indicus</i>	High. Already recorded but not in high numbers	Intentional introductions may be responsible for the presence of groups. Accidental introduction will have occurred wherever the species is kept in captivity	Lowland waters and nearby meadows or arable farmland in invaded range	Given the low abundance of this species currently, it is likely that any ecosystem effects have so far been negligible or unrecorded. Concerns over Avian Influenza H5N1	Pale greyish body, dark-tipped yellow bill, pale orange legs and a mainly white head. Dark bar from eye to eye makes the bar-headed goose distinctive even at long range	Control by shooting as part of a specific management plan carried out by experts.	Please see species information on the NNSS website
Black swan	<i>Cygnus atratus</i>	High. Already well established in the region though breeding rates are poor	Deliberate introductions to parks	Lakes, ponds, rivers. Most common where wildfowl are fed by the public	HEALTH AND SAFETY. Breeding swans are aggressive and may reduce the opportunities for native waterfowl, especially mute swan, to nest nearby. On occasion, black and mute swans will hybridise. Swans can impact on grasslands and droppings can reduce water quality.	Swan but black in colour, with a deep red bill and eyes	Unknown	Please see species Risk Assessment on the NNSS website
Bog arum	<i>Calla palustris</i>	Low. Records indicate this species is recorded in the New Forest but is not common elsewhere	Deliberate plantings and escapees from garden environments	Boggy areas and shallow ponds	ECOLOGICAL. Could potentially take over the habitat displacing other flora	Tall stalked typical arum with leathery leaves and tall white flower spathe	In the New Forest the plants are controlled by the New Forest Non-Native Plants Project	Contact the New Forest Non-Native Plants Project website for more information

FRESHWATER - INVASIVE ALIEN SPECIES MANAGEMENT PRIORITIES...

Species Common Name	Scientific name	Risk of Intro	Pathways	Areas Affected	Impacts	Identification	Management / Good Practice Guidance	Notes on more Information
Canada goose	<i>Branta canadensis</i>	High. Very abundant and common across the UK and the south east region	Originally deliberately introduced but now the species spreads slowly via natural dispersal	Various freshwater habitats such as lakes, ponds and rivers.	ECOLOGICAL / ECONOMIC. Heavy grazers of aquatic and waterside vegetation and droppings can increase nutrient levels in water bodies and soils. This, plus trampling, can change the composition of plant communities	Variation in size and plumage but all are dark brown with a black head and neck and a band of white across the cheeks and throat. The bill and legs are blackish	Control by shooting as part of a specific management plan carried out by experts.	See the species Risk Assessment on the NNS website
Caspian mud shrimp	<i>Chelicorophium curvispinum</i>	High. Previously recorded and records indicate it is already in the region	Via ship ballast water/ sediment. Once in an area they naturally migrate and disperse	Freshwater or brackish waters where it inhabits rocks, wood, submerged vegetation and bivalve shells	ECOLOGICAL / ECONOMIC. High densities of these filter feeders become the primary consumers in a habitat. Can also change the ecosystems via construction of 'mud tubes'	Arched grey-yellow body of up to 7 mm in length. Very large antennae with 1-2 smaller spurs on the fourth segment. For a more detailed description please see the species datasheet on the CABI website	Unknown. Biosecurity essential	Please see the species datasheet on the CABI website
! Chinese mitten crab !	<i>Eriocheir sinensis</i>	High. Already abundant in some catchments (such as the Medway)	Originally introduced via ballast water, individuals will naturally migrate between freshwater and brackish environments	Early stages are found in lower estuarine areas with saline conditions. Adults are usually found in fresh or brackish waters in rivers. Muddy banks are required to provide habitat to burrow into for protection	ECOLOGICAL / ECONOMIC. Likely to impact native populations in freshwater and marine systems, through predation and competition. Has the potential to outcompete the native white-clawed crayfish. May cause siltation of gravel runs used for spawning by salmon and trout. Economic costs via riverbank damage and repairing flood defences	See Figure 10 page 73. A large crab. Carapace has four teeth on each side. Olive green in colour with paler legs, which are twice the length of the body. Obvious feature is the dense mat of hair on the claws. The leading edges of the legs are also very hairy	Unknown	For more information please see the species information on the NNS website

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Species Common Name	Scientific name	Risk of Intro	Pathways	Areas Affected	Impacts	Identification	Management / Good Practice Guidance	Notes on more Information
Chinese water deer	<i>Hydropotes inermis</i>	Low. Small populations scattered throughout the country but spread is slow	Natural but translocations and releases/escapees facilitate spread	Mainly marshes with reeds, sedges or coarse grasses	HEALTH AND SAFETY / ECO-NOMICAL. Grazing appears to have little impact. Some risk of road collisions	Small deer with brownish-grey pelage, redder in summer. Often seen in marshland. No antlers; males have prominent downward-pointing tusks. This species lacks a white rump-patch, and has only a short tail	Control by shooting as part of a specific deer management plan, carried out by experts.	See the species information sheet on the NNSS website
Curly waterweed	<i>Lagarosiphon major</i>	High. Widespread in various areas and still widely for sale	Via deliberate or accidental releases from aquaria and ponds	Standing water such as lakes and ponds	ECOLOGICAL / ECONOMICAL. The species can totally outcompete other aquatic plants and smother ponds and waterbodies, also potentially exacerbating flood risk	A perennial, aquatic plant which can grow up to 3m completely submerged. Leaves are strongly curved and whorled around the stem or spirally arranged on the lower part of the stem	See the RAPID LIFE Good Practice Management Guidance on the NNSS website	See the RAPID LIFE Good Practice Management Guidance on the NNSS website
Duck potato	<i>Sagittaria latifolia</i>	Medium. Already established around London, with scattered populations in] South-West England and locally further north	Originally via discard from ponds and aquaria and now via transport of tubers on machinery, boats or fishing equipment	Wet ditches, pools, streams and on the margins of lakes and rivers	No known impacts	A rhizomatous aquatic plant. Leaves and flower clusters arising from the base. The leaves are shaped like arrow heads	Unknown	See the species information on the NNSS website

FRESHWATER - INVASIVE ALIEN SPECIES MANAGEMENT PRIORITIES...

Species Common Name	Scientific name	Risk of Intro	Pathways	Areas Affected	Impacts	Identification	Management / Good Practice Guidance	Notes on more Information
Egyptian goose	<i>Alopochen aegyptiacus</i>	High. Already widespread throughout the region	Originally introduced for ornamental reasons and has escaped captivity. It now spreads naturally	A wide range of wetland habitats including lakes, ponds, reservoirs, estuaries and wet woodland	ECOLOGICAL / ECONOMIC. May impact on other wetland birds for food and resources. May also compete with hole-nesting species such as barn owls (the Egyptian Goose nests in elevated nest holes). May damage crops and habitats via trampling and grazing	Pale reddish/brown with long pink legs and a pinkish bill. Variable reddish-brown patches around the eyes and another on the lower breast. Calls are loud and braying	For more information see the species Risk Assessment on the NNSS website	See the species Risk Assessment on the NNSS website
Floating pennywort	<i>Hydrocotyle ranunculoides</i>	High. Already quite well established in the region	Originally introduced for aquariums and ponds this species has escaped and now spreads easily via vegetative means along waterbodies via plant fragments being carried in the water or on boats and equipment	Various waterbodies. Likes slow flowing or still locations such as marinas but will also grow in large river systems	ECOLOGICAL / ECONOMIC. Very invasive and fast growing. Can quickly cover a waterbody, blocking out light and outcompeting native vegetation. Can impact on access and navigation and choke waterbodies	Green kidney shaped emergent floating leaves. Forms dense mats across the water surface. Long submerged trailing fleshy stems	Various methods depending on biomass of mats and access. See the RAPID LIFE Good Practice Management Guidance on the NNSS website	See the RAPID LIFE Good Practice Management Guidance and the species information both on the NNSS website
Goat's rue	<i>Galega officinalis</i>	High. Already widespread in the region	Spreads as a contaminant via fragments on other plants or material	Freshwater ditches	ECOLOGICAL / ECONOMIC / HUMAN HEALTH. This species can outcompete native plants. It is toxic to ruminant animals and so economical losses are possible	Shrubby upright perennial. Can grow to 2 meters. It is multi-stemmed with alternate compound leaves and purple to white pea-like flowers	Various methods, mainly chemical. Reported to be difficult to control and good biosecurity is essential (Barrett 2013)	See the species information on the CABI website

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Species Common Name	Scientific name	Risk of Intro	Pathways	Areas Affected	Impacts	Identification	Management / Good Practice Guidance	Notes on more Information
Giant hogweed	<i>Heracleum mantegazzianum</i>	High. Already widespread throughout much of the region	Originally introduced as an ornamental this species now spreads prolifically via seed. Seeds are transported along waterways	River banks and wetland areas though has also been seen on occasion quite far from original riparian habitats	HUMAN HEALTH / ECOLOGICAL / ECONOMICAL. The sap of this species can burn the skin and result in sun sensitivity which can be persistent for many years. As such, contact with any part of the plant should be avoided. It outcompetes other species and results in bare riverbanks in winter which can erode and increase siltation and exacerbate flood risk. Difficult to control due to viable seed banks makes control costly	When fully grown this umbellifer (member of the cow-parsley family) can grow to several metres and has a large umbel flower head up to 80 cm in diameter. The stem has red/purple blotches and the bright green leaves are sharply divided	Can be dug up or cut down but the Health and Safety implications and the often inaccessible riverbanks makes manual control difficult. As such herbicide control is often carried out. See the RAPID LIFE Good Practice Management Guidance on the NNSS website	See the RAPID LIFE Good Practice Management Guidance on the NNSS website
Giant knotweed	<i>Fallopia sachalinensis</i>	High. Already well established especially around London and home counties	Originally introduced it now spread by vegetative means and via plant fragments, most likely via irresponsible garden waste removal and dumping and via plant fragments floating downstream	River banks and freshwater lakes as well as urban areas and wastelands	ECOLOGICAL / ECONOMICAL. Outcompetes native vegetation for resources. Can also hybridise with Japanese Knotweed (see page 63) to give a highly invasive hybrid knotweed <i>F. x bohemica</i> . Similar impacts to Japanese knotweed with regards to planning and control costs	Large erect perennial herb which forms dense thickets. Stems grow 4-5 m in a single season and bear large, alternate leaves up to 40cm long. Green/white flowers	Similar to Japanese knotweed and good practice guidance is essential. For more information see the species information on the NNSS website	For more information see the species information on the NNSS website

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Species Common Name	Scientific name	Risk of Intro	Pathways	Areas Affected	Impacts	Identification	Management / Good Practice Guidance	Notes on more Information
Giant rhubarb	<i>Gunnera tinctoria</i>	High. Very well established across the region	Once introduced for ornamental purposes, the species now spread easily via natural dispersal. Each plant can produce up to 250,000 seeds which are then distributed by birds, water and human activity such as the movement of soil containing the seeds. It can also regenerate from small fragments of rhizome	Various wet and damp habitats. Likes stream and riverbanks, wetland edges and wet woodland	ECOLOGICAL / ECONOMIC. The large size of these plants means that it easily outcompetes native vegetation. It can also block waterbodies and exacerbate flood risk and can be costly to control	Large clump forming perennial which has huge round leathery leaves on bristly stems	Various methods though due to the size of the plants and access, chemical control is most practical. See CABI datasheet for more information	See species information on the NNSS website
Golden club / floating arum	<i>Orontium aquaticum</i>	Low. Some records for the New Forest area	Importation for aquarium and garden centres and escaping into the wild, via deliberate planting or irresponsible dispose of garden and pond waste	Ponds and wetlands	None known	Emergent plant with water repellent dark green, velvety oblong leaves which grow in groups and emerge from the water on stalks. Named for the shape of the yellow flowers which grow at the tip of a club-shaped stalks (IFAS 2018)	Unknown	Native to the US. Little information from UK
Goldenrod	<i>Solidago canadensis</i>	Medium. Already abundant in some catchments	Cultivated as a garden plant the species has spread into the wild naturally and via irresponsible garden waste disposal	Riverbanks	ECOLOGICAL / ECONOMIC. Dense stands along waterbodies can impede flow and exacerbate flood risk. It is poisonous to horses. The species can also displace native species	Can be confused with the native goldenrod <i>Solidago virgaurea</i> . Tall (up to 2 m) with numerous small yellow flowers forming pyramidal flower heads	Various methods. For information see the species datasheet on the CABI website	See species information on the NNSS website and species datasheet on the CABI website

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Species Common Name	Scientific name	Risk of Intro	Pathways	Areas Affected	Impacts	Identification	Management / Good Practice Guidance	Notes on more Information
Himalayan balsam	<i>Impatiens glandulifera</i>	High. Very well established and widespread across the region	After being introduced as a garden plant, this species now spreads along riverbanks and along the edges of wetland areas via seed. Explosive seed dispersal method and seeds are transported by water	Riverbanks, streams and wetland areas	ECOLOGICAL / ECONOMIC. Very damaging, causing erosion to river banks, and forming dense stands that increase the likelihood of flooding and, upon winter die back of this annual, riverbank are left bare which increases the risk of erosion. It also reduces or suppresses native vegetation	Now the tallest UK annual, growing to over 2 metres in a single season. Has hollow green stems with a reddish tinge and flowers are variable in colour from purple-pink and occasionally almost white and have a helmet-like / drooping appearance. See the CABI datasheet for more information	Hand pulling and cutting. See the RAPID LIFE Good Practice Management Guidance on the NNSS website	See the RAPID LIFE Good Practice Management Guidance on the NNSS website and/or the CABI datasheet on the CABI website.
Himalayan knotweed	<i>Persicaria wallichii</i>	High. Already widespread	The horticultural trade and the species escapes from gardens and/or via irresponsible garden waste disposal. Seeds are wind and water dispersed and roots and stem fragments are dispersed in waterways or via flooding	Marshes and riverbanks	ECOLOGICAL. Grows vigorously and creates large, dense stands that displace native vegetation and prevent tree seedlings from growing	Shrubby perennial herb with lanceolate leaves and creamy white flowers growing in clumps. See CABI datasheet for more information	Various methods. See CABI datasheet for more information	See CABI datasheet for more information
Hybrid knotweed	<i>Fallopia x bohemica</i>	Medium	<i>Fallopia x bohemica</i> is a hybrid between <i>Japanese knotweed</i> and Giant knotweed <i>Fallopia sachalinensis</i>	Rivers, streams and saltmarshes	ECOLOGICAL / ECONOMIC. Similar to Japanese knotweed. See Japanese knotweed or the CABI datasheet on the CABI website for more information	Very similar to Japanese knotweed with larger leaves. See CABI datasheet on the CABI website for more information	Similar to Japanese knotweed. See Japanese knotweed or the CABI datasheet on the CABI website for more information	See Japanese knotweed or the CABI datasheet on CABI website for more information

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Species Common Name	Scientific name	Risk of Intro	Pathways	Areas Affected	Impacts	Identification	Management / Good Practice Guidance	Notes on more Information
Japanese knotweed	<i>Fallopia japonica</i>	High. Already well established and widespread throughout the region.	Introduced as a horticultural ornamental, the species now spreads via both the rhizome and via vegetative means due to irresponsible waste removal and poor management	Riverbanks, wasteland, railway lines, urban areas	ECONOMICAL / ECOLOGICAL. IUCN lists it amongst the top 100 invasive species of global concern. It causes a huge amount of economic and environmental damage in the UK including damaging buildings, infrastructure, increasing flood risk and outcompeting native species	Tall, dense stand forming bushy perennial. It has red/purple blotched bamboo-like stems and green glossy leaves on often red zig-zag style stems. Flowers are long, white and drooping	This species is classed as Controlled Waste and care needs to be taken to ensure control does not exacerbate spread. See the RAPID LIFE Good Practice Management Guidance on the NNSS website	See the RAPID LIFE Good Practice Management Guidance on the NNSS website
Marsh frog	<i>Pelophylax ridibundus</i>	High. Already widespread throughout the south east and south west regions	Via pet trade and accidental introductions via importation of fish stock. Deliberate releases of pets and now via natural dispersal along waterbodies	Various waterbodies. Tolerates various flow rates.	ECOLOGICAL. Marsh frogs may outcompete and displace native amphibians. They are predatory and may predate on native amphibian, birds and invertebrates. May also carry and transmit diseases to native amphibians	See Figure. 11 page 73. A large frog. Often strikingly green. Unlike the native common frog they have no eye mask/markings on the face. They have a pronounced snout and two vocal sacs on either side of the head. They call loudly and can be seen jumping into water if approached	Unknown. See Species Information on the NNSS website	See Species Information on the NNSS website
New Zealand pigmyweed / Australian swamp stone-crop	<i>Crassula helmsii</i>	High. Already widespread throughout the region	Introductions may continue via online plant sales. Spreads via plant fragments being displaced by boats or animals and being moved by water. May be translocated as contaminants with other plants or on equipment	Various shallow waterbodies and surrounding habitats	ECOLOGICAL / ECONOMICAL. Can impede flow in irrigation channels and block channels, exacerbating flood risk. Can hinder access and recreation and lower amenity value. Can create 100% cover over a waterbody, blocking light and reducing oxygen levels. Totally displaces native species	See Figure 12 page 73. Aquatic perennial that can have three forms; submerged, emergent and terrestrial. Succulent small leaves on trailing stems. Creeping plant. Small white flowers with four petals	Good biosecurity is essential to stop the spread. Difficult species to control. Various methods. See the RAPID LIFE Good Practice Management Guidance on the NNSS website	See the CABI datasheet on the CABI website and the RAPID LIFE Good Practice Management Guidance on the NNSS website

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Species Common Name	Scientific name	Risk of Intro	Pathways	Areas Affected	Impacts	Identification	Management / Good Practice Guidance	Notes on more Information
Nuttall's & Canadian waterweed / pondweed	<i>Elodea nuttallii</i> and <i>Elodea canadensis</i>	High. Already widespread in the region	Via trade as an ornamental plant. Spreads via plant fragments which are displaced and/or carried by water animals and birds and/or as contaminants on fishing equipment and boats	Various waterbodies; drainage ditches, lakes, ponds, streams	ECOLOGICAL / ECONOMICAL. Can form dense stands which displace other aquatic plants, block light and produce anoxic conditions in the water. Plant decomposition leads to toxic siltation. Dense stands can prevent the use of water for recreational activities. <i>E. Canadensis</i> is thought to be less impacting than <i>E.nuttallii</i>	Both plants have aquatic long creeping/branching stems up to 30cm. See CABI Datasheet on the CABI website for more information	Various. See the RAPID LIFE Good Practice Management Guidance on the NNSS website	See CABI Datasheet on the CABI website and the RAPID LIFE Good Practice Management Guidance on the NNSS website
Orange balsam	<i>Impatiens capensis</i>	High. Already widespread in the region and appears to be on the increase	Similar to / see Himalayan balsam	Riverbanks and marshy areas	ECOLOGICAL. Similar to though not as impacting as Himalayan balsam though appears to be on the increase, potentially moving into areas where Himalayan balsam has been removed (unconfirmed)	Similar to though smaller and less dense than Himalayan balsam. Flowers are smaller and orange in colour	Similar to/see Himalayan balsam	See more information on the Botanical Society of British and Ireland (BSBI) website
Parrot's feather	<i>Myriophyllum aquaticum</i>	High. Already well established throughout the region.	Intentional introduction for and via aquaculture and horticulture. Escapes confined range. Spreads via fragments floating in the waterbody and by deliberate release	Still or slow flowing water bodies. Usually ponds, lakes and marsh areas	ECOLOGICAL / ECONOMICAL. Causes flooding by blocking watercourses and drainage channels. Can rapidly dominate a water body displacing native species. Decomposition increases siltation	Aquatic plant with both emergent and submerged forms. Fine feathery leaves in whorls of 4 to 6. Leaves pale green. Long trailing submerged stems with brown roots around intermittent nodes	Hand pulling and raking are the best methods though other methods are available. See CABI datasheet on the CABI website for more information	See species information sheet on the NNSS website. See CABI datasheet on the CABI website

FRESHWATER - INVASIVE ALIEN SPECIES MANAGEMENT PRIORITIES...



Species Common Name	Scientific name	Risk of Intro	Pathways	Areas Affected	Impacts	Identification	Management / Good Practice Guidance	Notes on more Information
Pickrel weed / heartleaf / oval leafed pondweed	<i>Pontederia cordata</i>	Low. Records indicate it is in the New Forest area, but otherwise is not well established or widespread	Via aquaculture / horticulture and deliberate planting	Marginal aquatic habitats such as marshes	Unknown	Herbaceous perennial with glossy erect, lance shaped leaves and purple upright tubular flowers.	Unknown	Contact the New Forest Non-Native Plants Project .
Piri-piri bur	<i>Acaena novae-zelandiae</i>	Medium. Already present in the New Forest.	Ornamental planting. Natural pathways/ transfer via animals, seed and clothing	ECOLOGICAL. Forms persistent dense vegetation mats in open habitats, preventing establishment/ spread of native species	Coastal, sandy soils and sand dunes	Dwarf perennial shrub (2-15cm high), that produces distinctive red burrs	Various including chemical, manual, mechanical and natural methods such as grazing. RAPID LIFE Good Practice Management Guidance	
Pitcher plant	<i>Sarracenia purpurea</i>	Low. Records indicate it is in the New Forest area but otherwise unknown.	Via horticulture trade and deliberate planting	Boggy areas and ponds	ECOLOGICAL. Plants are carnivorous and will therefore impact slightly on native invertebrates. Could potentially take over a boggy habitat	Variable colour, usually green, reddish or purple. Visible veins. Typical pitcher plant appearance with open tube leaves	For information please contact the New Forest Non-Native Plants Project .	For information contact the New Forest Non-Native Plants Project .
! Quagga mussel !	<i>Dreissena rostriformis bugensis</i>	Medium. Occurs in west London and risk of spread is high	Shipping and boats are the main means of introduction and spread. Adults can attach to boat hulls and planktonic larvae can inhabit ballast waters and be translocated via water currents	Freshwater systems such as rivers and lakes. Can tolerate brackish water	ECONOMICAL / ECOLOGICAL. As they attach to hard surfaces, they can clog drainage, irrigation and in-flow pipes, attach to and damage hulls, docks, locks and sluice gates. Filters huge quantities of nutrients from water bodies, taking this resource away from native species	Small rounded mussel with deep keel, slight zig-zag markings (like the Zebra mussel) but fainter and with a more obvious central stripe. Undulating seam and basal groove.	Good biosecurity to stop spread is vital. See the RAPID LIFE Biosecurity pages and the Check Clean Dry campaign page both on the NNSS website	For more information see the Rapid Life Management Toolkit 'Alert Species'

FRESHWATER - INVASIVE ALIEN SPECIES MANAGEMENT PRIORITIES...

Species Common Name	Scientific name	Risk of Intro	Pathways	Areas Affected	Impacts	Identification	Management / Good Practice Guidance	Notes on more Information
Terrapin	<i>Trachemys scripta spp</i>	Medium. Several species are already present in the UK though natural dispersal is slow	Via the pet trade and with subsequent deliberate releases	Variety of freshwater habitats such as ponds, lakes and rivers. Common near urban park ponds which have most likely been the initial release site in an area	ECOLOGICAL. Animals are opportunistic omnivores so may have an impact on native flora and fauna	Various, depending on the species. See Terrapin Information UK for more information	Various methods. See the RAPID LIFE Good Practice Management Guidance on the NNSS website	There are a number of non-native terrapin species in the UK including: Red-eared terrapin (Red-eared slider, Red-eared turtle), Yellow-bellied terrapin, Cumberland slider and Common slider
Red swamp crayfish	<i>Procambarus clarkii</i>	Medium. Several populations in the London area	Via aquaculture and via seafood industry and deliberate releases and escapes	Freshwater habitats such as river, ponds and lakes	ECOLOGICAL. Produce a vast number of offspring so populations grow rapidly. The species cuts vegetation which can affect turbidity and reduce native species. A carnivorous animal it can directly impact on native species such as insects and molluscs	Crayfish up to 15cm long with bright red spines on claws and a rough appearance	Various. For more information see the Rapid Life Management Toolkit 'Alert Species' information on the NNSS website	For more information see the Rapid Life Management Toolkit 'Alert Species' information on the NNSS website and the CABI datasheet on the CABI website
Ruddy Duck	<i>Oxyura jamaicensis</i>	Low. Only a few populations remain	Imported into wildfowl collections with later deliberate releases and escapes	Various and differs depending on the season; marshes, lakes and sheltered brackish and coastal areas	ECOLOGICAL. Threatens the globally endangered white-headed duck (<i>Oxyura leucocephala</i>) with extinction due to hybridisation and competition	Small diving duck with white cheek patch, chestnut red body plumage, and blue bill. For more information see the CABI Datasheet	The UK eradication programme included shooting and trapping. See CABI Datasheet for more information.	An eradication programme began in 2005, which has succeeded in reducing the UK population by 95% as of 2010 (CABI Datasheet)

FRESHWATER - INVASIVE ALIEN SPECIES MANAGEMENT PRIORITIES...

Species Common Name	Scientific name	Risk of Intro	Pathways	Areas Affected	Impacts	Identification	Management / Good Practice Guidance	Notes on more Information
Signal crayfish	<i>Pacifastacus leniusculus</i>	High. Already well established across the region	Introduced for food consumption but it escaped from holdings and quickly dispersed along waterbodies. It can also travel across land	Streams, rivers, canals, lakes and ponds. Can also survive in brackish water	ECOLOGICAL / ECONOMIC. The signal crayfish is contributing to the rapid decline in native white-clawed crayfish due to transmission of crayfish plague and competition. They also predate a wide range of animals and so may impact on other native species and food webs. The species creates deep and interconnecting tunnels in the riverbanks which can lead to bank instability and erosion, increased flood risk and economical costs	Lobster-like appearance. Reaches a maximum size of about 16-18cm, it is much larger than the native white-clawed crayfish. Its claws have red undersides with a small turquoise/white blotch on the upper surface at the claw hinge	Various. For more information see the Rapid Life Management Toolkit 'Alert Species' information on the NNSS website	For more information see the Rapid Life Management Toolkit 'Alert Species' document and the species information page both on the NNSS website
Spiny-cheek crayfish	<i>Orconectes limosus</i>	Medium. Already fairly well established in a few catchments with spread likely throughout the region	Initial deliberate releases. Subsequent natural dispersal away from initial release sites	Rivers, wide streams, ponds and lakes. It prefer calm and turbid waters rather than fast flowing areas	ECOLOGICAL. Similar to / see Signal Crayfish	Distinctive spiny cheeks, legs with orange tips and striped abdomens. They are often seen with black colouration due to black from the sediment they live in	Various. For more information see the Rapid Life Management Toolkit 'Alert Species' page on the NNSS website	For more information see the Rapid Life Management Toolkit 'Alert Species' page and the species information both on the NNSS website

FRESHWATER - INVASIVE ALIEN SPECIES MANAGEMENT PRIORITIES...

Species Common Name	Scientific name	Risk of Intro	Pathways	Areas Affected	Impacts	Identification	Management / Good Practice Guidance	Notes on more Information
Three cornered garlic	<i>Allium triquetrum</i>	Medium. Already established in a number of catchments in the region	Deliberate introductions followed by natural spread. Seeds of this species are spread by ants	Various including riverbanks but also woodlands and verges	ECOLOGICAL. Can form dense clumps which may outcompete other similar species for space and resources	Short, bushy appearance with long thin three angled stems and narrow leaves. White drooping flowers have obvious green strips. Smells of garlic if crushed	Digging and chemical. See Invasive Weed Solutions for more information	There are other non-native garlics in the UK too. See the garlics factsheet on the NNSS website
Turkish crayfish	<i>Astacus leptodactylus</i>	Medium. Already well established in a number of catchments around London	Deliberate and accidental introductions. Sold in markets as a live food item, crayfish escaped into London waterways	Lakes, rivers, canals and streams though can also live in brackish water	ECOLOGICAL / ECONOMIC. Impacts are thought to be lower than that of other non-native crayfish such as Signal crayfish as the Turkish crayfish does not carry crayfish plague. It will consume a variety of native flora and fauna however and may impact on fishing via competing with fish stocks	See Figure. 14 page 73. Up to 30cm long, with long, narrow claws that are rough on the upper surface. Ridges behind the eye sockets and a long snout like appearance. Varying in colour from a pale yellow or green to dark green blue. Paler individuals may appear mottled. Leg joints are often orange	Various. For more information see the Rapid Life Management Toolkit 'Alert Species' or the species information page, both on the NNSS website	For more information see the Rapid Life Management Toolkit 'Alert Species' or the species information page, both on the NNSS website

FRESHWATER - INVASIVE ALIEN SPECIES MANAGEMENT PRIORITIES...

Species Common Name	Scientific name	Risk of Intro	Pathways	Areas Affected	Impacts	Identification	Management / Good Practice Guidance	Notes on more Information
Virile crayfish	<i>Orconectes virilis</i>	Medium. Currently well established in the Lee catchment (north London) and thought to be spreading	Deliberate introductions, potentially as a biocontrol agent to reduce weeds in ponds (Larson and Olden 2008). Once released natural spread occurs via waterways and via crayfish moving across land	Various freshwater systems. A generalist species which can be found in a variety of different flow rate habitats. In the UK it is in the river Lee catchment	ECOLOGICAL. Similar to / see Signal Crayfish or for more information see the CABI datasheet for the species	Dark golden brown colouration. Has distinctive flattened claws which are spotted with many yellow warts. Smooth body with spines. For more information see the Rapid Life Management Toolkit 'Alert Species' information on the NNSS website and the CABI datasheet for the species	Various. For more information see the Rapid Life Management Toolkit 'Alert Species' information on the NNSS website	For more information see the Rapid Life Management Toolkit 'Alert Species' information on the NNSS website and the CABI datasheet for the species
Water fern	<i>Azolla filiculoides</i>	High. The species is already well established in many areas of the south east region	Horticulture/aquatics. Deliberately introduced and sold as a oxygenating pond plant and subsequently escaped from confinement. Spreads via small plants fragments and via spores	Freshwater. Prefers still habitats such as ponds and lakes but is also frequently seen in drainage ditches and slow flowing rivers and streams	ECOLOGICAL. Spreads quickly. Mats will completely cover a water-body in a very short space of time. Mats reduce the light and oxygen levels in the water which severely impacts on other flora and fauna	See Figure. 15 page 73. A perennial aquatic floating fern. Most likely the only free floating fern in the UK (CEH 2004). Leaves are made up of rosettes of scale. And it forms dense mats across a waterbody. It can be green but is often seen in a red form if under stress or if approaching winter	Best practice for this species is the Water fern north American weevil biocontrol . Weevils can be purchased from CABI. Other management options exists. See the CABI datasheet for more information	For more information see the species information page on the NNSS website or the CABI datasheet on the CABI website

FRESHWATER - INVASIVE ALIEN SPECIES MANAGEMENT PRIORITIES...

Species Common Name	Scientific name	Risk of Intro	Pathways	Areas Affected	Impacts	Identification	Management / Good Practice Guidance	Notes on more Information
! Water Primrose !	<i>Ludwigia grandiflora</i>	Medium. Small areas may remain in a few catchments.	Via deliberate planting. Spread via transportation of plant fragments by flowing water, by movement of plant material or unscreened water (e.g. fish transfers) and as a contaminant on material such as on footwear, boats, tyres or livestock. (Renals 2016)	Usually inhabits slow or still flow freshwater habitats such as lakes and ponds but can grow in rivers and streams	ECOLOGICAL / ECONOMICAL. Can severely impact on native flora due to allelopathic activity which affects water quality. It also overshadows and smothers other aquatic flora and so impacts in several ways. In France it has been seen to block slow-moving waterways, hinder navigation and impact on drainage in lakes, ponds and ditches. Once established the cost to control the species is considerable	See Figure. 16 page 73. Perennial aquatic plant with variable leaf shape. Dark green leaves with distinctive mid-rib. More distinctive in it's floating form when it creeps across the water surface on long stems. Care is needed to distinguish it from other species when it is growing as a marginal emergent and it is best searched for when in flower (July to August)	Good biosecurity is essential to contain an infestation and stop it's spread. Control methods include manual, mechanical and chemical. See the RAPID LIFE Management Toolkit 'Alert Species' or the Good Practice Guidance page, both on the NNSS website or Renals (2016)	See the RAPID LIFE Management Toolkit 'Alert Species' or the Good Practice Guidance page, both on the NNSS website or Renals (2016)
Zebra mussel	<i>Dreissena polymorpha</i>	High. Well established in the region already	Initially introduced via shipping i.e adults attached or on imported products. Spreads via larvae drifting downstream (they can drift for 300km before attaching to a surface so spread is wide) and by being transported to new locations by being attached to boats an equipment	Various. Can inhabit both fresh and brackish water and will attach itself to hard structures	ECOLOGICAL / ECONOMICAL. / HUMAN HEALTH. A filter feeder, it can filter about a litre of water a day which, where large populations exist, can reduce oxygen and nutrients in the water for other fauna. It will attach itself to native mussel which can result in their death and further reduced population. Can clog water pipes, filters and turbines so effect water treatment works and power station intakes. Can impact on fisheries aquaculture and shipping due to attaching itself to equipment. Sharp shells may cause injury	A sessile bivalve small mollusc of typically 20 mm in length. Brownish-yellowish colour with a characteristic dark and light coloured ("zebra") zigzag banding	See the RAPID LIFE Good Practice Management Guidance on the NNSS website	See the RAPID LIFE Good Practice Management Guidance on the NNSS website



SPECIES GALLERY



Figure. 10 Chinese mitten crab © The Food and Environment Research Agency (Fera)



Figure. 12 New Zealand pigmyweed © GBNNSS



Figure. 14
Turkish crayfish
© GBNNSS



Figure. 15 Water fern © GBNNSS



Figure. 11 Marsh frog © RPS Group



Figure. 13 Pacific oyster © Medway Swale Estuary Partnership



Figure. 16 Water Primrose
Ludwigia grandiflora
© GBNNSS



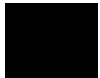



INVASIVE ALIEN SPECIES MANAGEMENT PRIORITIES...




The Management Priority Grids on the following pages indicate the species already present in the region and the priorities for their management (or eradication). Data has been analysed on a catchment by catchment scale and is demonstrated in the grids to give as much locally specific information as possible. Similarly the South East TraC catchment has been divided up to indicate the approximate area affected by an INN. As such, as per the species information tables, we have two grids; one for coastal and estuarine habitats (SE TraC and Thames TraC catchments) and one for the freshwater catchments. Some species, such as Chinese mitten crabs, will appear in both grids as they can move between brackish and freshwater systems.

Management Priorities Grid Colour Explanation:

 Black is for species of high concern which are present in only some catchments. Their prevention into other catchments is the highest priority. In the grid, the black cells are where the species is not, as far as is known, currently present. Where they are present there will be a different colour (see below) depending on the perceived level of priority and management feasibility.

 Red is for early detection and eradication. Species are present but not well established or abundant and so it is cost effective to seek eradication (where effective control exists). Black List species which are detected (in new regions) should be moved to the Red category if a control measure is known. If eradication is not feasible due to no known control, they will be represented by orange or green (see below).

 **Long Term Management:** Species which are well established and/or for which eradication is not feasible are classified under Long Term Management. This section is split into two sections. Species where control is very important due to their impact are represented in orange. If no control is known, biosecurity is essential for these species and control methods should be researched. Species whose management is not such a priority due to lower impact and/or where the cost effectiveness of control is poor, are in green.

COASTAL AND ESTUARINE - INVASIVE ALIEN SPECIES MANAGEMENT PRIORITIES - MANAGEMENT PRIORITIES GRID



SPECIES	LONDON and THAMES TraC AREAS	DARENT AND CRAY	MEDWAY & SWALE ESTUARY	NORTH KENT	ROTHER	THANET (STOUR)	PEVENSEY & C'MERE	ADUR & OUSE	EAST H'SHIRE	ARUN & WESTERN STREAMS	TEST & ITCHEN	NEW FOREST	ISLE OF WIGHT
American lobster									High	High		High	High
American oyster drill			Medium	Medium									
American piddock	Medium	Medium	Medium	Medium		Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium
American razor clam	Medium		Medium	Medium	Medium	Medium	Medium	Medium					
American sand gaper	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium
Asian shore crab			Medium			Medium							
Australasian (Darwin's) barnacle	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium	Medium

COASTAL AND ESTUARINE - INVASIVE ALIEN SPECIES MANAGEMENT PRIORITIES - MANAGEMENT PRIORITIES GRID...

SPECIES	LONDON and THAMES TraC AREAS	DARENT AND CRAY	MEDWAY & SWALE ESTUARY	NORTH KENT	ROTHER	THANET (STOUR)	PEVENSEY & C'MERE	ADUR & OUSE	EAST H'SHIRE	ARUN & WESTERN STREAMS	TEST & ITCHEN	NEW FOREST	ISLE OF WIGHT
Brush clawed crab			Yellow			Red							
Carpet sea squirt						Yellow		Yellow	Yellow		Yellow	Yellow	Yellow
Caspian mud shrimp	Red												
! Chinese mitten crab !	Yellow		Yellow			Yellow	Yellow	Yellow					Yellow
Devils tongue weed						Light Green		Light Green	Light Green		Light Green	Light Green	Light Green
Green sea fingers								Red	Red	Red			

COASTAL AND ESTUARINE - INVASIVE ALIEN SPECIES MANAGEMENT PRIORITIES - MANAGEMENT PRIORITIES GRID...



SPECIES	LONDON and THAMES TraC AREAS	DARENT AND CRAY	MEDWAY & SWALE ESTUARY	NORTH KENT	ROTHER	THANET (STOUR)	PEVENSEY & C'MERE	ADUR & OUSE	EAST H'SHIRE	ARUN & WESTERN STREAMS	TEST & ITCHEN	NEW FOREST	ISLE OF WIGHT
Harpoon weed	Black	Black	Black	Black	Black	Black	Black	Black	Black	Green	Black	Green	Green
Manila (carpet shell) clam	Yellow	Black	Yellow	Yellow	Yellow	Yellow	Black	Black	Yellow	Yellow	Yellow	Yellow	Yellow
Leathery sea squirt	Black	Black	Yellow	Yellow	Black	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
Orange cloak sea squirt	Black	Black	Yellow	Black	Black	Yellow	Black	Yellow	Yellow	Yellow	Yellow	Yellow	Black
Orange-tipped sea squirt	Black	Black	Black	Black	Black	Green	Green	Green	Green	Green	Green	Green	Green

COASTAL AND ESTUARINE - INVASIVE ALIEN SPECIES MANAGEMENT PRIORITIES - MANAGEMENT PRIORITIES GRID...



SPECIES	LONDON and THAMES TraC AREAS	DARENT AND CRAY	MEDWAY & SWALE ESTUARY	NORTH KENT	ROTHER	THANET (STOUR)	PEVENSEY & C'MERE	ADUR & OUSE	EAST H'SHIRE	ARUN & WESTERN STREAMS	TEST & ITCHEN	NEW FOREST	ISLE OF WIGHT
Oyster thief						High		High	High	High		High	High
Pacific oyster	High		High	High	High	High		High	High	High		High	High
Pom-Pom weed						High	High						
Red ripple bryozoan									High				
Ruby bryozoan			High	High		High	High	High		High	High	High	High
San Diego sea squirt			High		High	High	High	High		High		High	High
Slipper limpet	High	High	High	High	High	High	High	High	High	High	High	High	High
Tufty-buff bryozoan			High			High		High	High	High	High	High	High
Tree groundsel												High	
Trumpet tube worm			High			High			High	High	High	High	High

COASTAL AND ESTUARINE - INVASIVE ALIEN SPECIES MANAGEMENT PRIORITIES - MANAGEMENT PRIORITIES GRID...

SPECIES													
	LONDON and THAMES TraC AREAS	DARENT AND CRAY	MEDWAY & SWALE ESTUARY	NORTH KENT	ROTHER	THANET (STOUR)	PEVENSEY & C'MERE	ADUR & OUSE	EAST H'SHIRE	ARUN & WESTERN STREAMS	TEST & ITCHEN	NEW FOREST	ISLE OF WIGHT
Wakame (Japanese kelp)													
Wireweed													

The following grid represents species distribution and management priorities for the freshwater catchments.

See page 74 for the introduction / information about the colours of the grid cells.

FRESHWATER - INVASIVE ALIEN SPECIES MANAGEMENT PRIORITIES - MANAGEMENT PRIORITIES GRID



Species	Catchment																
	LONDON	COLNE	UPPER LEE	RODING, BEAM & I'BOURNE	MOLE	DARENT AND CRAY	MEDWAY & MEDWAY & SWALE ESTUARY	NORTH KENT	ROTHER	STOUR	PEVENSEY & C'MERE	ADUR & OUSE	EAST H'SHIRE	ARUN & W. STREAMS	TEST & ITCHEN	NEW FOREST	ISLE OF WIGHT
Alpine newt	Yellow	Black	Yellow	Black	Black	Black	Black	Black	Black	Yellow	Yellow	Black	Black	Black	Black	Yellow	Black
American mink	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Black	Black	Yellow	Yellow	Black
American skunk cabbage	Red	Black	Black	Black	Black	Black	Red	Black	Black	Black	Black	Black	Black	Yellow	Yellow	Yellow	Red
Bar-headed goose	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Black swan	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Bog arum	White	White	White	White	White	White	White	White	White	White	White	White	White	White	White	Red	White
Canada goose	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Caspian mud shrimp	Red	Black	Red	Black	White	White	Red	White	Red	Black	Black	White	White	White	White	White	White
Chinese mitten crab	Yellow	Yellow	Yellow	White	Black	Yellow	Yellow	Yellow	White	Black	Black	Black	Black	Black	Black	Black	Black
Chinese water deer	White	White	White	White	White	White	White	White	White	White	White	White	White	Yellow	White	Black	White

FRESHWATER - INVASIVE ALIEN SPECIES MANAGEMENT PRIORITIES - MANAGEMENT PRIORITIES GRID



Species	Catchment																	
	LONDON	COLNE	UPPER LEE	RODING, BEAM & I'BOURNE	MOLE	DARENT AND CRAY	MEDWAY & SWALE ESTUARY	NORTH KENT	ROTHER	STOUR	PEVESEY & C'MERE	ADUR & OUSE	EAST H'SHIRE	ARUN & W. STREAMS	TEST & ITCHEN	NEW FOREST	ISLE OF WIGHT	
Common cord grass	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	
Curly waterweed	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Red	Black	Yellow
Duck potato	Green	Black	Green	Black	Black	Black	Green	Black	Black	Green	Black	Black	Black	Black	Black	Black	Black	Black
Egyptian goose	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Floating pennywort	Yellow	Yellow	Yellow	Black	Yellow	Yellow	Yellow	Yellow	Black	Black	Yellow	Red	Black	Red	Red	Red	Red	Red
Goat's - rue	Yellow	Yellow	Yellow	Black	Black	Black	Yellow	Black	White	White	Yellow	White	White	White	White	White	White	White
Giant hogweed	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Red	Yellow	Yellow	Yellow	Red	Red	Red
Giant knotweed	White	White	White	White	White	White	White	White	White	White	White	White	White	White	White	White	Light Green	White
Giant rhubarb	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Black	Yellow	Yellow
Golden Club	White	White	White	White	White	White	White	White	White	White	White	White	White	White	White	White	Yellow	White

FRESHWATER - INVASIVE ALIEN SPECIES MANAGEMENT PRIORITIES - MANAGEMENT PRIORITIES GRID

Species	Catchment																
	LONDON	COLNE	UPPER LEE	RODING, BEAM & I'BOURNE	MOLE	DARENT AND CRAY	MEDWAY & SWALE ESTUARY	NORTH KENT	ROTHER	STOUR	PEVENSEY & C'MERE	ADUR & OUSE	EAST H'SHIRE	ARUN & W. STREAMS	TEST & ITCHEN	NEW FOREST	ISLE OF WIGHT
Goldenrod																	
Himalayan balsam																	
Himalayan knotweed																	
Hybrid knotweed																	
Iris laevigata																	
Japanese knotweed																	
Marsh frog																	
New Zealand Pigmyweed																	
Nuttall's & Canadian waterweed																	

FRESHWATER - INVASIVE ALIEN SPECIES MANAGEMENT PRIORITIES - MANAGEMENT PRIORITIES GRID



Species	Catchment																
	LONDON	COLNE	UPPER LEE	RODING, BEAM & I'BOURNE	MOLE	DARENT AND CRAY	MEDWAY & SWALE ESTUARY	NORTH KENT	ROTHER	STOUR	PEVESEY & C'MERE	ADUR & OUSE	EAST H'SHIRE	ARUN & W. STREAMS	TEST & ITCHEN	NEW FOREST	ISLE OF WIGHT
Orange balsam	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
Parrot's feather	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
Pickerel-weed	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Red
Piri-piri burr	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Red
Pitcher plant	White	White	White	White	White	White	White	White	White	White	White	White	White	White	White	White	Red
Prickly heath	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Red
Quagga mussel	Black	Yellow	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black
Red swamp crayfish	Yellow	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black
Ruddy duck	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red

FRESHWATER - INVASIVE ALIEN SPECIES MANAGEMENT PRIORITIES - MANAGEMENT PRIORITIES GRID



Species	Catchment																
	LONDON	COLNE	UPPER LEE	RODING, BEAM & I'BOURNE	MOLE	DARENT AND CRAY	MEDWAY & MEDWAY & SWALE ESTUARY	NORTH KENT	ROTHER	STOUR	PEVESEY & C'MERE	ADUR & OUSE	EAST H'SHIRE	ARUN & W. STREAMS	TEST & ITCHEN	NEW FOREST	ISLE OF WIGHT
Signal crayfish	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
Spiny-cheek crayfish	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Yellow	Yellow	Black	Black	Black	Black	Black
<i>Terrapin Sp</i>	Yellow	White	White	White	White	White	White	White	White	White	Yellow	Black	White	Yellow	Yellow	Black	Yellow
Three cornered garlic	Black	Black	Black	Black	Black	Black	Green	Black	Green	Black	Green	Black	Black	Green	Black	Yellow	Black
Turkish crayfish	Yellow	Yellow	Yellow	Yellow	Black	Yellow	Yellow	Black	Yellow	Black	Black	Black	Black	Black	Black	Black	Black
Virile crayfish	Black	Black	Red	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black	Black
Water fern	Yellow	Yellow	White	White	Black	Black	Yellow	Yellow	Yellow	Yellow	Yellow	Black	Black	Yellow	Yellow	Red	Yellow
! Water primrose !	Red	Black	Black	Black	Black	Black	Red	Black	Black	Black	Black	Black	Red	Red	Black	Red	Red
Zebra mussel	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow



CONCLUSION:



The RIMPs are living documents and it is intended that they will periodically be updated as and when situations change and as new data and records are submitted, for example. All stakeholders who have engaged in this process are encouraged to remain in communication about INNS and the South East RIMP and, whilst APHA will instigate updates, MVCP intend to continue to co-ordinate the South East INNS Forum which will help facilitate this future communication. In addition, the creation of the new RAPID LIFE mapping tool, [INNS MAPPER](#), hosted by Yorkshire Wildlife Trust, will also help facilitate updates in the future. Please upload any INNS records to [INNS MAPPER](#). MVCP are a regional champion for INNS MAPPER for the South East and will upload local data to the site for the Medway and encourage south east stakeholders to do the same for their work areas. High Alert species should be reported to [GBNNSS](#) and/or [CEH](#).

In addition to periodic updates of the RIMPs, there are many areas and species where there are gaps in knowledge and understanding, especially for coastal and marine species. Trial management of certain INNS is needed. For example, the implementation of some trial management / eradication of carpet sea squirt (*D. vexillum*) including in the Solent.

With global warming and world trade increasing, the problems presented by INNS may worsen i.e. more introductions, greater rapidity and increasing severity. Climate change models need to feed into the plans for INNS including horizon scanning and risk assessments. Local Action Groups would benefit from baseline data on the economic cost of INNS as this might influence future funding, especially with asset managers.

More work needs to be done to support Check Clean Dry and biosecurity awareness raising as the infrastructure to ensure and enforce good practise is often not in place. Funding is needed for wash down stations or mobile wash down facilities which can be taken to high risk events and activities.

MVCP/MSEP would like to thank all those who have assisted with the creation of the South East RIMP and the other RIMPs around the country. We see this as a vital step in INNS control co-ordination and we can now move forward from a baseline, with co-ordination and communication across regions, to tackle invasive non-native species and work to safeguard biodiversity.



ADDITIONAL INFORMATION:



More information can be gathered on INNS and biosecurity generally and specifically for the south east region, from the following organisations:

[Angling Trust](#)

[CABI](#)

[Centre for Ecology and Hydrology](#)

[Guardians of the Deep](#)

[INNS MAPPER](#)

[Joint Nature Conservation Committee](#)

[London Invasive Species Initiative \(LISI\)](#)

[Medway Valley Countryside Partnership](#)

[Medway Swale Estuary Partnership](#)

[New Forest Non-Native Plants Project](#)

[Non Native Species Secretariat](#)



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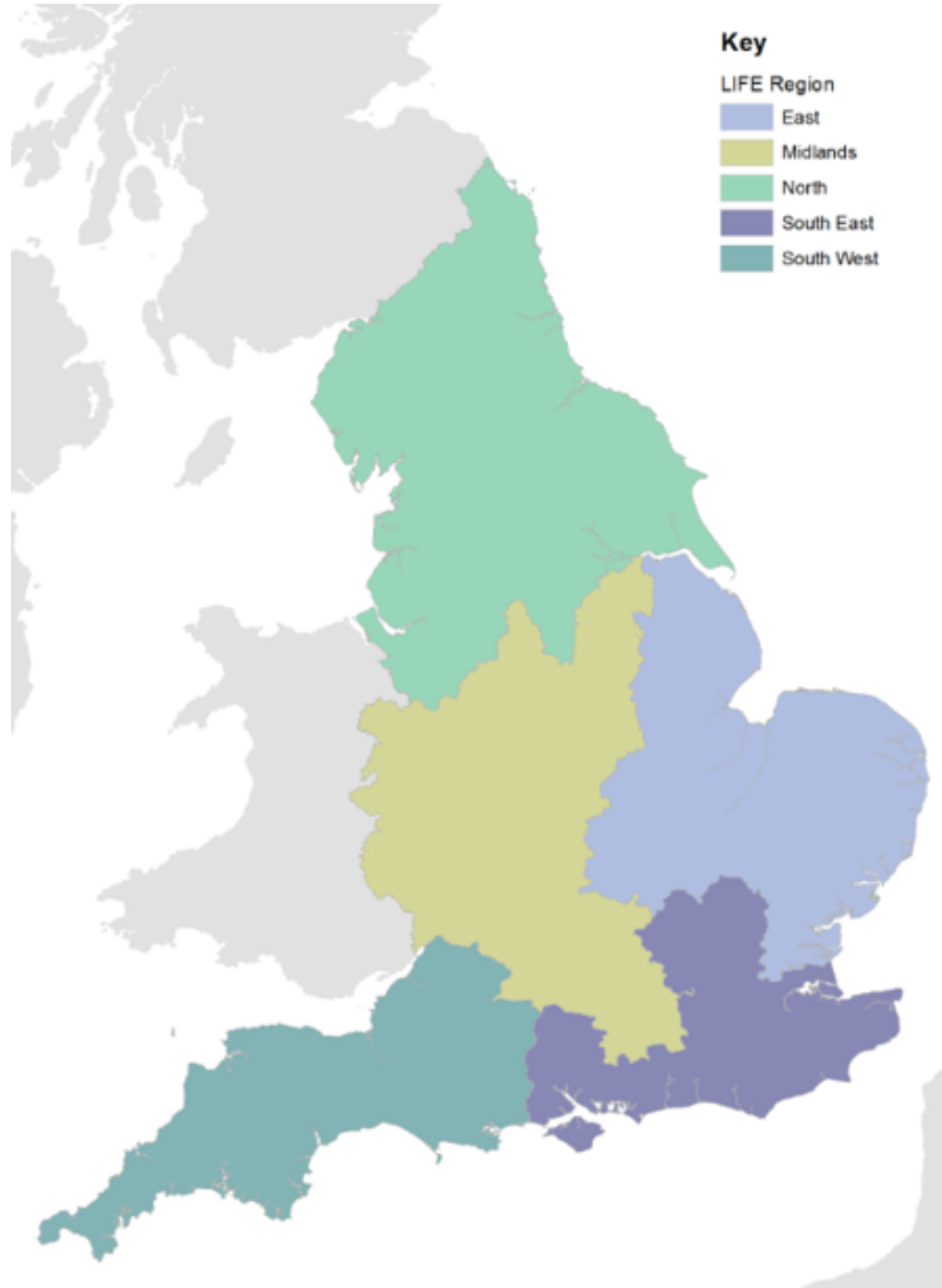
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APPENDICES:

- Appendix 1— RAPID LIFE Regions Map - Page 89
- Appendix 2— Non-Aquatic Species Grid - Pages 90 –92

APPENDIX 1 - RAPID LIFE REGIONS MAP



APPENDIX 2 - NON AQUATIC SPECIES GRID

Species	Catchment																	
	LONDON	COLNE	UPPER LEE	RODING, BEAM & I'BOURNE	MOLE	DARENT AND CRAY	MEDWAY & SWALE ESTUARY	NORTH KENT	ROTHER	STOUR	PEVENSEY & C'MERE	ADUR & OUSE	EAST H'SHIRE	ARUN & W. STREAMS	TEST & ITCHEN	NEW FOREST	ISLE OF WIGHT	
! Asian hornet !	[Black]													[Red]	[Black]			
Asian long-horn beetle	[Black]																	
Aquilegia																	[Yellow]	
Berberis																	[Red]	
Buddleia davidii	[Green]	[Green]	[Green]	[Green]	[Green]	[Green]	[Green]	[Green]	[Green]	[Green]	[Green]	[Green]	[Green]	[Green]	[Green]	[Green]	[Green]	[Green]
Cotoneaster sp.	[Green]	[Green]	[Green]	[Green]	[Green]	[Green]	[Green]	[Green]	[Green]	[Green]	[Green]	[Green]	[Green]	[Green]	[Green]	[Green]	[Green]	[Green]
Evergreen oak	[Green]	[Green]	[Green]	[Green]	[Green]	[Green]	[Green]	[Green]	[Green]	[Green]	[Green]	[Green]	[Green]	[Green]	[Green]	[Green]	[Green]	[Green]
False acacia	[Yellow]						[Green]		[Green]	[Black]	[Green]					[Black]		
Few Flowered Leek	[Black]	[Yellow]	[Yellow]	[Black]	[Black]	[Black]	[Black]	[Black]	[Black]	[Black]	[Black]	[Black]	[Black]	[Black]	[Black]	[Black]	[Black]	[Black]
Grey squirrel	[Green]	[Green]	[Green]	[Green]	[Green]	[Green]	[Green]	[Green]	[Green]	[Green]	[Green]	[Green]	[Green]	[Green]	[Green]	[Green]	[Green]	[Black]
Goat's - rue	[Yellow]	[Yellow]	[Yellow]	[Black]	[Black]	[Black]	[Black]	[Yellow]	[Black]			[Yellow]						
Himalayan honeysuckle									[Green]		[Green]						[Green]	

APPENDIX 1 - NON AQUATIC SPECIES GRID...

Species	Catchment																
	LONDON	COLNE	UPPER LEE	RODING, BEAM & I'BOURNE	MOLE	DARENT AND CRAY	MEDWAY & MEDWAY & SWALE ESTUARY	NORTH KENT	ROTHER	STOUR	PEVENSEY & C'MERE	ADUR & OUSE	EAST H'SHIRE	ARUN & W. STREAMS	TEST & ITCHEN	NEW FOREST	ISLE OF WIGHT
! Indian House Crow!																	
! Invasive Garden Ant !																	
Japanese rose																	
Monk parakeet																	
Montbretia																	
New Zealand Flatworm																	
Prickly heath																	
Reeves Muntjac																	

APPENDIX 1 - NON AQUATIC SPECIES GRID...



Species	Catchment																
	LONDON	COLNE	UPPER LEE	RODING, BEAM & I'BOURNE	MOLE	DARENT AND CRAY	MEDWAY & MEDWAY & SWALE ESTUARY	NORTH KENT	ROTHER	STOUR	PEVESEY & C'MERE	ADUR & OUSE	EAST H'SHIRE	ARUN & W. STREAMS	TEST & ITCHEN	NEW FOREST	ISLE OF WIGHT
Ring necked parakeets	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Rhododendron	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Russian vine	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Sika deer	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
<i>Spiraea</i>	White	White	White	White	White	White	White	White	White	White	White	White	White	White	White	Yellow	White
Tree of heaven	Yellow	White	White	White	White	White	White	White	White	White	White	White	Red	White	White	White	White
Turkey oak	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Variagated yellow archangel	White	White	White	White	White	White	White	White	White	White	White	White	White	White	White	Green	White
Winter heliotrope	Green	Green	Green	White	White	White	White	White	Green	Green	Green	White	White	Green	White	Green	Green