Broads Forum
7 November 2013
Agenda Item No 8

Update on Non-Native Species Projects in the Broads
Report by Senior Ecologist and
Project Manager (Previously Wetland Biosecurity Officer)

Summary: This report provides members with an overview of work on non-native species in the Broads, including the project on raising awareness and creating new biosecurity practices for stopping the spread of invasive shrimp within and outside of the Broads catchment. The report particularly considers how biosecurity relates to the Broads Plan and how the Broads Authority undertakes control and encourages best practice for biosecurity for organisations and users of the Broads through the Broads Biosecurity Project, supported by the Communications Team and funding partners. Members are asked to note the report.

1 Background and Broads Plan Context

1.1 The Broads Plan sets out three key priorities for the Broads Authority and its partners over the lifetime of the plan. One of the priorities identified in the Plan is working in partnership on the sustainable management of the Broads. Under this theme the Broads Authority recognises the sharp rise in numbers of invasive non-native species (INNS) arriving in the Broads and the need to work in partnership to manage this threat and share the rising costs of communicating biosecurity, control and eradication programmes. Additionally, the Plan identifies a further priority of encouraging sustainable use and enjoyment of the Broads. This theme places emphasis on the need for the Authority to continue to inform users, contractors and tourism business about the critical importance of biosecurity of the waterway and land area.

1.2 The Plan also recognises the need to monitor the status of INNS and develop and implement biosecurity plans in the Broads. The Authority therefore works through the Biodiversity and Water Strategy and through our involvement of the Norfolk Non-Native Species Initiative (NNNSI), which includes the Senior Ecologist chairing the Initiative. Together this work delivers improvements in Broads and the wider catchment area, as well as encouraging better biosecurity through entry to schemes like the ‘Go Native’ a garden centre accreditation scheme and ‘Broadsweep’ awareness raising and reporting scheme (funded by the SDF).

1.3 Acting quickly to communicate, control or eradicate INNS has been proven as essential to keep costs and environmental impacts as low as possible. For most invasive species either the cost spiral upwards as the population extends its foothold, or the ability to control is lost forever. The main results

Broads Biosecurity Project, the Broads Authority core work as well as involvement in the NNNSI for the content of this report.

2 Broads Biosecurity Project

2.1 As a result of the discovery of *Dikerogammerus villosus* (killer shrimp) in the River Ant in 2012, the Authority put together a proposal for a Wetland Biosecurity Officer and was successful in gaining funding from internal budgets, the Environment Agency, Natural England and Defra for a 12 month post. Invasive shrimp pose a significant threat in UK waterways. In certain habitats they build up to huge populations and through predation on other aquatic organisms can completely alter aquatic foodwebs.

2.2 The Broads Biosecurity Project was aimed at improving public knowledge of invasive species, especially the invasive shrimp *Dikerogammarus villosus*, and increasing levels of public compliance with the Defra 'Check, Clean, Dry' campaign.

2.3 The headline actions are:

- Biosecurity officer, 357 days in post
- 135 significant interactions (such as attending pike angling and canoe events)
- 103 signs erected across the Broads
- 26 newspaper / media interviews
- 1,423,178 people reached through media coverage
- 15,000 leaflets produced
- 35 articles written
- 2 Surveys produced and written up to measure the campaigns effect
- 7 comprehensive reports written
- 92% of surveyed public recognise *Dikerogammarus villosus*
- 9% increase in the numbers of general public following Check, Clean, Dry procedures
- 14% increase in high risk user compliance with Check, Clean, Dry

2.4 It has been demonstrated that a targeted promotional campaign across many platforms can affect a behavioural change amongst the public. A high uptake of messages across all users in each group requires several communication methods and formats, combined with the need for regular and repetitive sightings of information.

2.5 A final report provides full details of the work carried out during the 12 month project. The report can be found at Appendix 1. The project has been very successful, producing significant changes in attitude and behaviour amongst both the general public and high risk water users.

2.6 The recommendations for further work are as follows:

- The work with local clubs and associations will provide some longevity through clubs expecting their members to 'Check, Clean, Dry'. However regular communication of key messages will be required in the future.

- Surveys have shown that there is a public desire for more information about invasive species - from signage, to ID cards and location maps.
- Scientific research undertaken during the project into hot water treatments for *Dikerogammarus villosus* has been used with some contractors in the Broads and incorporated into treatment methodology used by the Environment Agency nationwide. Further work is required to embed this into all contractors' standard operations in the Broads and this has not been proven to be onerous, or cause extra expense to contractors.
- With the end of the Wetland Biosecurity Officer post, the amount of direct communication work with the public, clubs and associations will decrease significantly and future opportunities should be taken to find additional funding for this important work as reporting and local action will be important to stop the spread of species in the future and this is unlikely to happen without facilitation.

3 Broads Authority Control Measures and Support of the Norfolk Non-Native Species Initiative (NNNSI)

3.1 The Broads Authority as a first priority encourages landowners to undertake control of invasive plants. If this is not possible and the plants are posing a risk to larger areas of the Broads, including the navigation, the Authority has appointed contractors to undertake small scale removals of a number high risk invasive plant species. This includes follow up to ensure that the species are eradicated. Volunteers also undertake control for priority species such as Himalayan balsam.

3.2 The Broads Authority is a partner and continues to support the NNNSI and sub groups - which include the Mink Management Project and Floating Pennywort Steering Group - via financial contribution as well as chairing the NNNSI steering group. The coordinated action across the river catchment and the wider area of Norfolk is essential for the effective control in the long term. It is also forms a priority action area within the Broadland catchment approach.

3.3 The NNNSI has produced a strategic plan, recording schemes (including i-phone App), volunteer days of action, funded control invasive aquatic and bankside plants (such as Himalayan balsam, Japanese knotweed, floating pennywort and giant knotweed) upstream of the Broads to ensure that there is no spread to the Broads. Supporting this approach is providing highly cost effective long-term security for integrated waterways objectives, particularly navigation, fishing and wildlife interests.

3.4 Further EU Intereg funding has been found by Norfolk County Council to continue with the programme of work, under the banner of RINSE (Reducing the Impact of Non-Native Species in Europe) and future EU Life funding is also being sought by Norfolk County Council.

4 Next Steps

4.1 Where species are affecting the Broads directly it is important to have systems that allow us to react rapidly to high risk species. These internal systems include project budgets, a full understanding the impacts - through communication and literature review – and recording and mapping species

4.2 Research shows that lack of action results in escalating costs and often failure to control the species resulting in permanent change to ecosystems. Hence continuing with operational, including volunteer action on priority species will be an ongoing requirement.

4.3 Despite the excellent Broads Biosecurity Project, there remains confusion about actions required to prevent the spread of many INNS. Continued work with residents, users and landowners is essential. With the Broads Authority owning and managing only a small percentage of the Broads, the opportunity for others to help manage the Broads in accordance to the Broads Plan is significant.

4.4 The Broads Authority is supporting research to understand the impact of invasive shrimp on the Broads. This will be undertaken by a PhD student at Queen Mary University London.

5 Conclusions

5.1 The Broads Authority is committed to protecting the Broads from the impacts of INNS, as well as encouraging further research and communication on the risks to the Broads. In order to understand the complex impacts of new and existing INNS, enable rapid action and work across the catchment within a strategic partnership, it is essential to maintain support for the NNNSI.

5.2 Both the results of the Broads Biosecurity Project and the eradication of floating pennywort from Bure, Gillingham Marshes and now the River Waveney demonstrates success is possible by rapid and sustained action. The Broads and Norfolk have an excellent reputation at delivering cost effective and innovative campaigns. Officers are frequently asked to report on the approach to other Local Action Groups at national events to inspire others.

5.3 The Broads is likely to have increasing pressure from INNS in the future. New research shows that the Broads lies within the highest risk area in the UK for new invasions. Resources for early action need to be maintained. Funds for ongoing control need to be secured, with landowners and users aware of their roles. The strategic Norfolk partnership is proven to be effective in the control of INNS that do not respect administrative boundaries of the Broads.

Author: Andrea Kelly
Date of report: 18 October 2013

Broads Plan Objectives: BD6, NA3, TR1 & 2

Appendices: APPENDIX 1 – Stop the Spread Invasive Aquatic Species

Broads Authority
The Broads - a member of the National Park family

Wetland Biosecurity Officer

Project Report

Will Burchnall, Wetland Biosecurity Officer

27th June 2013

Contents

Executive Summary

This report describes the Broads Authority Wetland Biosecurity Officer project aimed at improving public knowledge of invasive species, especially the invasive shrimp Dikerogammarus villosus, and increasing levels of public compliance with the Check, Clean, Dry campaign.

Headline actions:

- Biosecurity officer, 357 days in post.
- 135 significant interactions (Appendix A).
- 103 signs erected (Appendix C).
- 26 newspaper / media interviews.
- 1,423,178 people reached through media coverage (Appendix B).
- 15,000 leaflets produced (Appendix D).
- 35 articles written.
- 2 Surveys produced. (Appendix E).
- 7 comprehensive reports written. (Appendix F).
- 92% of surveyed public recognise Dikerogammarus villosus.
- 9% increase in the numbers of general public following Check, Clean, Dry procedures.
- 14% increase in high risk user compliance with Check, Clean, Dry

It has been demonstrated that a targeted promotional campaign across many platforms can affect a behavioural change amongst the public. A high uptake of messages across all users in each group requires several communication methods and formats, combined with the need for regular and repetitive sightings of information.

This report provides full details of the work carried out by the Wetland Biosecurity officer during the twelve month project. It also includes copies of quarterly reports and surveys carried out plus recommendations for future campaigns.

1. Project Objectives:

Main activity	*Short term action*	*Longer term goals*
Working through the Broads Operations Group (BA, Environment Agency, Natural England and the Norfolk Non-Native Species Initiative) assist in further developing and implementing strategies & plans	• Undertake induction briefing from / with each core partner • Attend relevant meetings • Categorise water user risk groups and locations and develop priority action plan • Keep operating guidance under review	• Integrate approach across agencies
Establish and maintain a network of appropriate notices around the Broads and high risk areas outside the Broads	• Arrange the provision of notices produced – practicalities of fixing and erecting; planning locations; putting them up • Establish recording / monitoring / updating system to control process	• Ensuring sign provision is adequate and effective
Provide bespoke and technical biosecurity advice, particularly 'Check Clean Dry' principles to water users including boater, anglers, other water users, businesses	• Familiarise self with advice and pre-prepare responses to main questions and 'testing areas' • Review advice and support material for each key user group identifying strengths & weaknesses • Establish contacts recording system and how follow up will be tackled • Trial discussions at a few points and review/refine approach (following appropriate discussion and advice) • Create a schedule of priority visits and actions	• Create record of progress and 'current situation' reports • Refine and add to advisory material when needed • Develop suite of support material to continue campaign motivation into the future
Provide 'training for trainers' and lead points of contact to advise clubs, boat yards and	• Consider and develop 'role description' for lead point contacts	• Create 'manual' type approach to capture learning and guide others

groups on biosecurity and a range of measures to deal with invasive non-native species in general	• Consider and develop how to establish a network (recording who and where; sharing of further information etc) • Identify early adopters and develop approach	
Provision of talks to clubs and groups, drop in sessions and attending events in the Broads catchment area such as the shows, festivals, regattas and angling matches.	• Establish calendar of options from discussion with colleagues, partners and stakeholders • Plan priority programme • Review with colleagues interpretation options already developed and consider any improvements or alternative options	• Develop downloadable web based support material for events
Work with water users to develop and find funding for measures to deal with the significance of this issue (boat wash down, drying facilities, clean and dedicated nets etc)	• Discussion with Sustainable Development Fund administrator • Discussion with external funding advisers (Suffolk and Norfolk County Councils?)	• Create listing of funding options with pros and cons
Help identify necessary applied ecological research, survey and monitoring, (supervising where necessary) and ensuring that findings are reported and disseminated widely to inform policies and the sustainable management of the habitats in the Broads.	• Join in some existing monitoring (EA?) • Explore NNNSI current work and priorities • Explore current data from monitoring to consider spread of Dv	• Review research dissemination to a lay audience
Liaise with other locations in the UK with non native species initiatives	• Discuss with partners options and value of visits to other locations	•
Provide guidance and advice on the provision of bio- security measures to other UK locations.	•	• Develop package of results and advice from the Broads process to help deployment elsewhere

2. Project Scope

Priorities:

- Recruit and train a number of volunteer check, clean, dry advocates to attend events.
- Complete a collateral stock take, order 2013 promotional material.
- Publish the event organiser's bio-security handbook.
- Launch the Broads best practice scheme to encourage business involvement in CCD.
- EA Rod licences – get CCD information sent out with every rod licence in 2013.

Audience	*Key Strategy*	*Message*	*Activities*	*Actions /Completed by*	*Measure*
Recreational waterway users	• Increase public exposure to the CCD message • Focus on "pathways" to increase public exposure to CCD message while travelling to and from freshwater activities.	• Check Clean Dry between every waterway • Freshwater pests can be invisible • Check, Clean, Dry, Everywhere, Every time	1. Encourage businesses to display CCD messages at point of sale and hire sites. 2. Get posters / leaflets at all relevant accommodation locations, B&B's private rental houses 3. Get CCD messages into local papers alongside tide / met info 4. Produce generic CCD promotional material that appeals to all users	1. Launch the Broads Best Practice scheme to encourage business involvement 2. Work with BA Tourism to distribute leaflets 3. Work with BA Press officer to explore opportunities for placing CCD logos in papers 4. Working with Shrimp Local Operations Group and BA Communications team to generate ideas and artwork.	• Improve awareness of CCD actions across all audience groups • Increase % of people who know what they are supposed to do to CCD • Increase the number of people who always CCD

Pleasure boaters	• Point of sale (POS) messages • Water access points • Messages with a family focus • Change users attitude that they can't CCD	• Family focussed messages, " protect our waterways for generations to come" • Broads specific messages " protecting Britain's magical water land"	1. Messages sent out with 2013 Boat Tolls 2. Material and messages at Tourist Information Centres 3. Messaging through Boat Clubs 4. Attendance at local boating events by trained BA volunteers 5. Advertising in speciality publications and Online	1. Continue to contact all retail stores (fishing, kayaking, boating, outdoors) to offer display materials and handouts 2. Ongoing – contact with local clubs to get messages online and in newspapers. 3. Volunteers attending events, Biosecurity officer to support with training, event materials and promo items.	• Decrease the % of Boaters who don't CCD especially those who replied " I don't know what I'm supposed to do" • Feedback from retailers • Feedback from Clubs • Evaluation of shows and events
Canoeists / Kayakers	• Point of Sale (POS) messaging • Water Access Points • Competitions / Events • Retail Outlets • Pre-trip planning	• Broads specific messages • "Check, Clean, Dry between waterways" • "CCD Everywhere Every time" • "Freshwater pests can be invisible"	1. Messaging through kayak / canoe clubs 2. Approach Kayaking websites asking them to display CCD message or link to information 3. Get local retailers onboard to promote CCD (Sue's Canoes, Norfolk Canoes) 4. Get local hire companies onboard (Canoe Man, Bank Boats) 5. Attendance at local events by trained BA volunteers	1. Ongoing – contact local clubs about getting CCD info on their websites and newsletters. 2. Finalise event organiser's pack and publish on GB NNSS website.	• Decrease number of people who don't CCD due to "not knowing exactly what to do" • Increase the % of people who Check equipment at the waterside. • Increase the number of people who CCD every time.

			6. Encourage event organisers to get CCD messages to competitors in advance.		
Anglers	• POS messaging • Water Access Point Signage. • Locations of invasive species available more widely. • Partnership with EA fisheries • Reinforce CCD and positive behaviour already achieved • Reinforce to fishermen that CCD methods they currently use for Killer Shrimp also applies to all freshwater Invasives • Pre-trip planning	• Reinforce that Anglers are doing a good job, positive messages! • Freshwater pests can be invisible • CCD Everywhere, Every time • Protect our waterways for future generations • CCD between waterways • Don't transfer water, organisms or mixed ground bait between waterways.	1. Material / messages available at retail outlets 2. CCD brochures with all Rod licences issued 3. Advertising on specialty websites and in Angling publications 4. Working closely with Angling Clubs and associations 5. Attendance at local events by trained BA staff 6. Attendance at events by CCD Angling Champions	1. Continue to contact all retail stores to offer display materials and handouts 2. Push EA to include CCD in 2013 rod licences 3. Attendance at local events by trained BA volunteers 4. Attendance at local events by CCD Angling Champions 5. Continue working closely with the EA, Angling Trust and local angling associations to promote CCD.	• Increase current levels of CCD awareness (72%) • Increase awareness of where invasive species are. • Increase % who Clean equipment • Decrease the numbers of people who don't CCD because they "don't know what to do"
Sailors	• Water access points • Pre-trip planning • Messages with a family focus • Change users attitude that they	• Family focussed messages, " protect our waterways for generations to come" • Broads specific messages " protecting	1. Messages sent out with 2013 Boat Tolls 2. Messaging through Boat Clubs 3. Attendance at local boating events by	1. Continue to contact all retail stores (fishing, kayaking, boating, outdoors) to offer display materials and handouts 2. Ongoing – contact with local	• Decrease the % of Boaters who don't CCD especially those who replied " I don't know what I'm supposed to do"

	can't CCD	Britain's magical water land"	trained BA volunteers 4. Advertising in speciality publications and Online	clubs to get messages online and in newspapers. 3. Volunteers attending events, Biosecurity officer to support with training, event materials and promo items.	• Feedback from Clubs • Evaluation of shows and events
Walkers / Bird Watchers	• Clubs and associations • Pre-trip planning	• "You have a part to play – always CCD when crossing waterways" • Freshwater pests can be invisible • Environmental messages – Protect our waterways, this place is worth protecting, protecting the Broads magical water land	1. Material and messages at BA hides 2. CCD messages on Maps 3. Contact local clubs to distribute materials and include messages online and in newsletters	1. Working with RSPB, Norfolk Wildlife Trust, nature reserves and trusts to promote importance of CCD and biosecurity	• Increase the number of people who have heard of the CCD message • Feedback from outside organisations.
Businesses	• Contractors working within the Broads	• CCD when moving between sites • Awareness of moving NNIS between waterways with operations or works	1. Messages to all contractors 2. Staff to be aware of CCD actions and importance	1. Working with BESL and Halcrow. 2. Make draft bio-security protocols freely available as templates for contactors	• Increase numbers of contractors conforming to CCD • Feedback issues raised

3. Key performance indicators and Targets

The success of the 2012-2013 programmes is measured using several key performance indicators set up at the end of the 2012 user survey.

KPI Measure	*Survey Question*	*December 2012 Results*	*Desired Indicator 2013*	*Results 2013*	*Target Met?*
Increase the number of users who CCD between waterways.	Q2	42%	65%	51%	
Increase the percentage of high risk* users who sometimes or always Check, Clean, Dry (or use different equipment) between waterways.	Q2	71%	85%	85.3%	
Increase the knowledge of invasive plant species (especially Floating Pennywort, Japanese Knotweed and Himalayan Balsam)	Q1	17% Floating Pennywort 26% Japanese Knotweed 14% Himalayan Balsam	40% Floating Pennywort 50% Japanese Knotweed 40% Himalayan Balsam	64% Floating Pennywort 84% Japanese Knotweed 53% Himalayan Balsam	
Focus on maintaining or increasing vigilance amongst high risk compliant waterway users	Q3	72% Check 51% Clean 87% Dry	90% Check 75% Clean 95% Dry	91% Check 74% Clean 83% Dry	
Reduce the number of respondents who find promotional information "sometimes unhelpful"	Q7	25% of Television and 18% of Newspaper information deemed unhelpful.	15% Television 10% Newspaper	18.9% Television 15.8% Newspaper	

*High risk users were defined as Anglers, Canoeists, Kayakers and Windsurfers

Key:  - Target not met (>5% below desired target)  - Target not met (<5% below desired target)  - Target met

4. Have anticipated benefits been achieved?

4.1 Check, Clean, Dry compliance

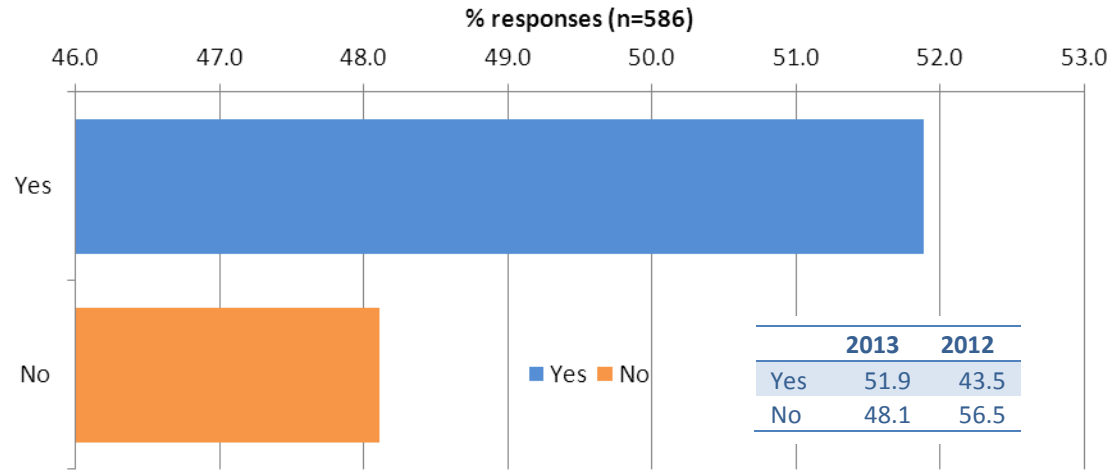


Figure 1: Chart of responses to Q2: When travelling around the Broads, do you take any special precautions to prevent the movement of water or invasive species from one place to another? Inset data shows comparison between 2013 and 2012 responses.

There has been a significant increase in the numbers of people taking precautions to prevent the spread of invasive species as they travel around the Broads. Breaking these results down into individual user groups reveals that the majority of high risk users (Canoeists, Kayakers, Anglers and Windsurfers) are compliant with CCD procedures. Levels of compliance amongst pleasure cruisers is still low with only 46% taking CCD precautions

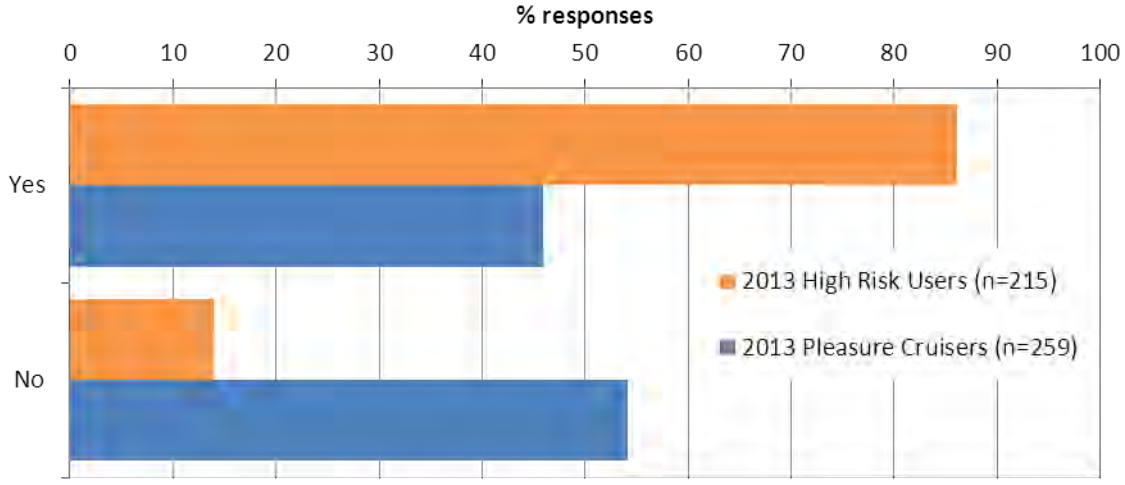


Figure 2: Comparison CCD compliance between high risk users and pleasure cruisers. Q2.

4.2 High and Low risk user group CCD compliance.

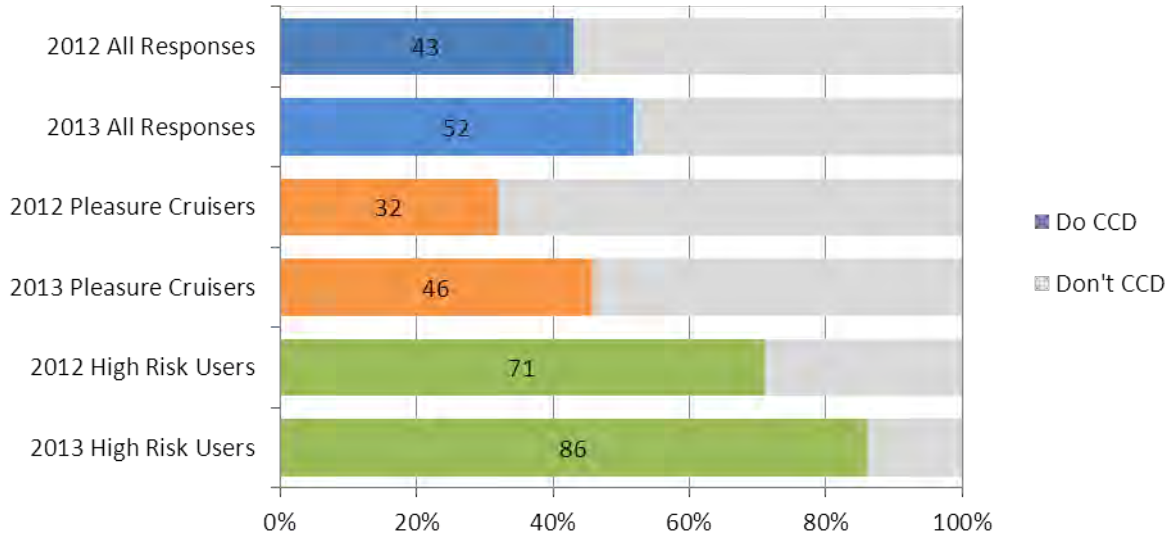


Figure 3: Analysis of 2012 and 2013 responses by user group. Coloured bars represent CCD compliant users, grey bars non-compliant users.

Further analysis of the structure of responses shows increased levels of compliance across all user groups. A 15% increase in compliance amongst high risk users is a significant improvement; in addition, the 14% increase in compliance amongst pleasure cruisers, historically the most difficult user group to influence, shows that the targeted marketing campaigns have had a degree of success.

4.3 What precautions are being taken?

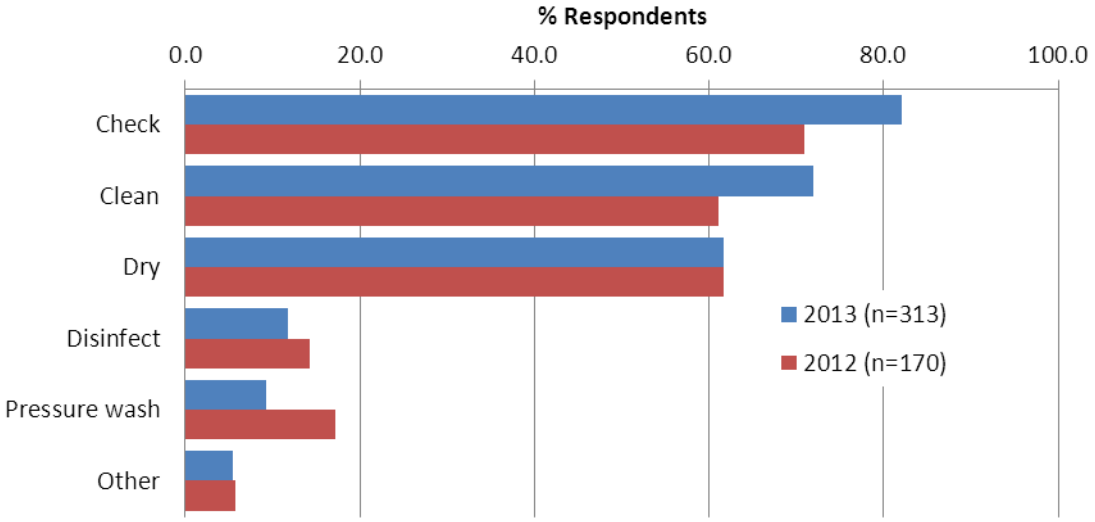


Figure 4: Comparison of 2012 and 2013 responses to Q3: What special precautions do you take to prevent the movement of water or invasive species?

Most respondents recognise the need to Check (82%), Clean (72%) and Dry (62%) their equipment. Improvements have been seen in the need to Check (+11.3%) and Clean (+10.7%) but almost no change in the number of people who dry their equipment (-0.1%). Levels of disinfection have

decreased, so too have pressure washing which may be attributed to reduced levels of promotion of these two methods.

4.4 How do individual groups compare year on year?

%	Canoe / Kayak	Angling	Pleasure Cruising	Sailing	Windsurfing
Check	74 ↑	96 ↑	78 ↑	77 ↑	100 ↑
Clean	64 ↓	76 ↑	73 ↑	77 ↓	100 —
Dry	72 ↑	88 ↓	43 ↑	64 ↑	60 ↑
Disinfect	8 ↓	11 ↑	15 ↓	0 ↓	0 —
Pressure wash	8 ↓	7 ↑	11 ↓	8 ↓	0 —
Other	4	4	5	8	0

Key: ↑ Increase on 2012 ↓ Decrease on 2012 — stayed same

Figure 5: Percentage CCD compliance by user group. Arrows indicate change from 2012

Encouragingly, reported checking and cleaning behaviours increased in 2013. While data shows that 51.9% of all respondents believe they are familiar with CCD actions and take precautions, "drying equipment" still lags behind "checking" and "cleaning" equipment. There has been significant improvement in reported behaviour when split by interest group. Drying continues to be the least practiced of the three methods, although the number of people drying equipment has risen for all groups except anglers.

5. Lessons Learnt

5.1 Successful communication methods

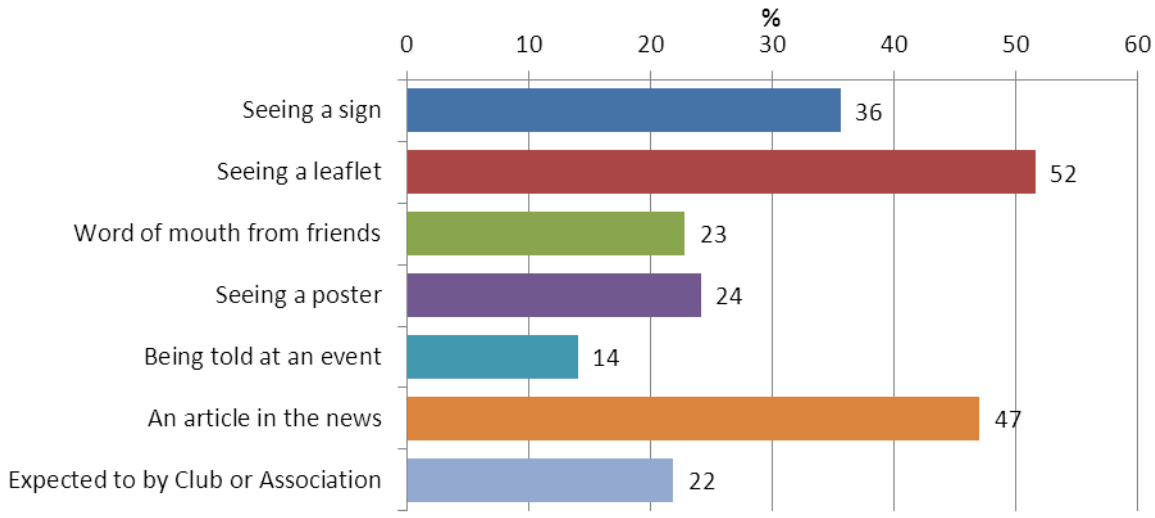


Figure 6: Q4: What were the main things that convinced you to take precautions?

Over 50% of respondents had been convinced to take precautions against the spread of NNIS from information they had seen in a leaflet, many of them would have been directly targeted by leaflets sent out in toll payers information packs.

Although less direct at targeting individuals, newspapers are still effective at convincing people to take precautions.

Signage around the broads is the third greatest driver for convincing people to take precautions. Since the start of the Biosecurity officer project around 100 signs have been erected at water access points, clubs, shops and angling sites across the Broads acting as constant visual cues, reminding people to follow CCD procedure at the end of their days sport.

The most interesting results from the Broads user survey is that more people are expected to follow CCD by their club / association. Promoting the need for CCD to committees and trustees of local clubs and association has been successful. They have understood the potential threats of NNIS and are working to pass that information on to members by encouraging them to CCD at access points and at competitions. Of the respondents who said that CCD was expected by their club, 51% were anglers, but more significantly, 19% of these respondents were pleasure cruisers and 12% sailors. The CCD message getting through to clubs at committee levels and they are working to persuade members to follow procedures.

5.2 Field Sampling methods

During the course of this project, several field sampling techniques have been used to locate and identify Dikerogammarus villosus (Dv). Commercially available shrimp traps have been ineffective at attracting or trapping Dv, even when left in situ for 10 days at a time. Sweep nets have been effective when surveying manmade structures such as piling, but with this method, there is an amount of luck involved with catching Dv in areas where they are sparse in the water column.

The most effective trapping method has been found to be lengths of rope. This forms an attractive habitat for the shrimp and they can easily burrow into the woven material which serves to hold them in place when the rope is removed from the water. The addition of 'bait' in the form of tinned cat food smeared lightly on the rope greatly increased the speed of colonisation. This method has been successful in locating Dv in areas where conventional trapping and sweep netting had been unsuccessful.

The home made sampling equipment consists of a length of hemp or polypropylene rope (3" in diameter) secured to a weight. A retrieval line is attached to the weight to allow the sampling equipment to be retrieved from the bank. The rope floats vertically in the water column, held in place by the weight. In itself, this is an effective 'trap' although the addition of the cat food bait greatly increases the habitation rate.

6. Decommissioning project:

6.1 Identifying follow on actions

During the project, several pieces of work have been developed but due to time constraints have not been developed sufficiently for public launch.

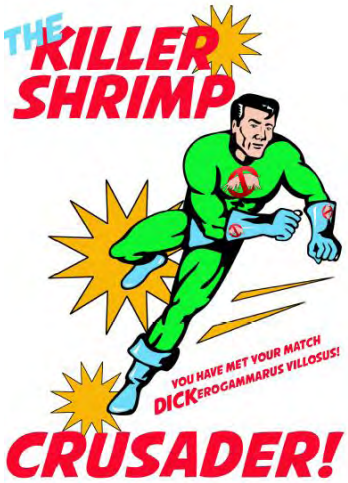
Broads Best Practice:
This scheme, designed to encourage businesses to incorporate biosecurity into their standard

operating procedures has been developed to a point where it requires graphic design and artwork produced. The accreditation scheme will be managed by the Norfolk Non-Native Species initiative and run alongside their current garden centre accreditation scheme.

Event Organisers Bio-security Pack:
The pack has been created in draft form and will require graphic design input. It has been sent to a selected number of event organisers for use at events this year, with the organisers asked to feed back any modifications they think necessary and to appraise what worked and what didn't. The follow up work will be completed by the Norfolk Non-native species Initiative. The pack has also been shared with the Cumbria Freshwater Invasive Non-native Species Initiative (CFINNS) as part of an information sharing exercise. The CFINNS pack is currently being prepared by graphic designers and should be released this year.

Non-Native species ID cards:
These cards are currently in print production. They will be distributed by the Broads Angling Strategy Group, the Angling Trust, Environment Agency, Broads Authority and Norfolk Non-native species initiative. Contact details for the Broads Authority and Environment agency contained within the booklets do not refer to individuals but the organisations main contact phone number and email addresses. The print run is limited to 500 copies; no provision has been made for further print runs or replacement of the booklets once the initial supply has been exhausted.

The Shrimp Crusader @shrimpcrusader:



The shrimp crusader has been very effective in communicating messages to the public, sharing ideas and information with the scientific community via the medium of Twitter. The end of the project will not be the end for the Shrimp Crusader whose mantle will be passed to another volunteer to continue the battle against the killer shrimp and invasive species.

6.2 Collateral stock take

The following promotional material remains in stock at the end of the project.

Item	No Remaining
Non-native species ID cards	500
CCD Boating Signs (A3)	19
CCD Angling Signs (A3)	14
Isolated Broad Shrimp signs (A4)	18
CCD wet note books	85
'Take Action' leaflets	600
Unhooking Mats	7

The non-native species ID cards will be distributed to organisations as described in section 6.1. The Broads Authority will keep a selection of signage to allow erection of further signs at water access points. The remainder will be passed to the Norfolk Non-native species initiative for use outside the Broads executive area. The wet note books and leaflets will be distributed between the Broads Authority tourist information centres for use by the public. The remaining unhooking mats will be distributed by the Broads Angling Strategy Group.

6.3 Responsibilities

The current levels of promotion will decrease at the end of the project and future public promotion of invasive species will be carried out jointly by the Broads Authority education officer and Norfolk non-native species initiative. Information reported by the public to the Broads Authority will be managed by the Broads Authority environment officers who will liaise with NNSI for any treatment work. All records will continue to be sent to Norfolk Biodiversity Information Service (NBIS).

7. Conclusions

The wetland biosecurity officer project has been very successful, producing significant changes in attitude and behaviour amongst both the general public and high risk water users. The work done with local clubs and associations will provide some longevity to messages and actions, with more and more clubs are expecting their members to check, clean, dry. It has been proven that regular contact with messages will help to ensure that water users are constantly reminded of the actions they need to take and the network of signs established around the Broads will affect that reminder.

Survey research has also shown that there is a public desire for more information about invasive species - from signage, to ID cards and location maps - and that the distribution of this information should be done using several mediums.

Scientific research undertaken during the project into hot water treatments for Dikerogammarus villosus has been used across the Broads and incorporated into treatment methodology used by the Environment Agency nationwide.

It has also been proven that biosecurity can be built in to the standard operating procedures of businesses even on large projects. Biosecurity work with BESL during the piling removal on the River Ant has shown that simple precautions are effective, are not onerous, or cause extra expense to contractors.

With the end of the wetland biosecurity officer post, the amount of direct communication work with the public, clubs and associations will decrease significantly but certain aspects will be continued by staff from the Broads Authority and Norfolk Non-native Species Initiative. Staff and volunteers who have been trained by the biosecurity officer during this project will still be actively promoting knowledge of invasive species at events and Broads Authority rangers will also remain on the lookout for signs of invasive species while they patrol the Broads.

The most significant product of the Wetland Biosecurity Officer project is the number of people who have been introduced to the effects of invasive species and have been encouraged to report sightings while they are out in the countryside. Making people aware of how important they can be in identifying and reporting species ensures that the project leaves behind a legacy. There are large

numbers of people who are devoted to, and want to look after, their own little patch of the countryside and by encouraging this local action, far more can be done to improve the landscape by eradicating unwanted problem invasive species.