Freshwater Habitats Trust

PondNet:
Multi-taxa structured surveillance of small standing water bodies

Year 3 report

DRAFT

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Summary

This report summarises work undertaken by the end of Year 3 (2013/14) in the trial period of the PondNet project, "Multi-taxa structured surveillance of small standing water bodies". The project's overall aim was to test the potential to develop a statistically robust volunteer network (PondNet) for surveillance of ponds in England, based on regional trials in South Hampshire, Cheshire and North East Yorkshire.

During the trial we specifically assessed the benefits of regional coordination and training on volunteer recruitment and retention, to determine whether we could meet the original aims of the network. Based on these results we investigated and costed a potential scenario for the future national roll-out of PondNet.

Broadly speaking the results from the PondNet trials were positive; suggesting that for this habitat the volunteer multi-taxa approach for species surveillance could provide statistically robust, valid data.

To achieve effective national roll-out, the results suggested that PondNet would need both national and local coordination. Volunteer recruitment was higher where training and local support were available, although the quality of data collected for more difficult taxa (wetland plants, macroinvertebrates) was determined by prior experience rather than training for the project.

The value of PondNet:

- It provides a standardised approach - there is a lot of pond-related recording in the UK, but it is sporadic and uses a variety of different monitoring techniques. Standard methods make all data more usable.

- Provides multi-taxa and environmental data - for ponds a single taxonomic group is unlikely to give a full picture of the state of the environment; the multi-taxa approach allows indices to be calculated which can show change in condition over time and against a reference condition. If changes are recorded, environmental data is critical for interpreting trends.

- Data are freely available to all – anyone can enter data, use and analyse records through the on-line system. Adhering to national guidelines data can be uploaded to the National Biodiversity Network and national species monitoring groups.

- Provides essential biodiversity data that is not being collected elsewhere. Countryside Survey data and Atlases every 8-10 years have a periodicity which is too long and often too late to make the necessary management and policy changes.

What worked in the PondNet trials?

- Sufficient data were collected for most taxa in the trial regions, so that if rolled out nationally, we would achieve the size of network needed to detect statistically significant change in key variables (these targets were calculated by *a priori* power analysis).

- Sufficient volunteers were recruited to PondNet. Engagement with volunteers at a local level was vital for recruitment and retention. Key elements of support which they needed were training and having site permissions arranged for them.

- Key S41 plants and invertebrate recording really enthused volunteers of all abilities, as well as being valuable data in their own right.

What could we improve?

- There was an appetite for the multi-taxa approach, but a limit on what volunteers can be expected to do e.g. either more ponds/sites/visits or more taxa. This left some sites under surveyed and more coordination would be required to get the survey completed by other volunteers.

- There is a clear difference in the skill level of different volunteers. Expert volunteers were needed to undertake key taxonomic groups, but there was a clear need to bring on new volunteers in these groups – mentoring would be one way to achieve this.
- Interaction with Species Non-Governmental Organisations (NGOs) worked well at *local* level e.g. New Forest - British Dragonfly Society, Conchological Society, Botanical Society of the British Isles (BSBI); Cheshire - Conchological Society, Yorkshire - British Dragonfly Society. But, with the exception of Amphibian and Reptile Conservation no clear strategic/working links were maintained beyond the initial project set-up at a *national* level.
- The data entry interface was relatively easy to use to input data, but there is still a lot of work needed to make it more interactive and to deliver feedback to volunteers, to check and validate the records and to agree data-flow pathways for partners and others.

National roll-out of PondNet:

- National coordination would be required initially to ensure that standards are maintained across the network, in terms of site selection, training and provision of web-tools to provide a shared hub for site selection, data entry and exchange and feedback to volunteers.
- Local coordination would ensure that the network was integrated into existing schemes, to deal with access permissions, and to recruit, train and provide on-going support for volunteers.
- One possible scenario would be for Local Record Centres to be involved in the local coordination as part of multi-taxa structured surveillance, with Freshwater Habitats Trust providing support and coordination at regional and national levels.
- We envisage taking a staggered approach to national roll-out, setting up the network on a county-by-county basis. Time and resources are required in the start-up year to establish the network at a local level but costs are substantially reduced in future years as materials and protocols will make the network relatively self-sustaining.
- Materials developed during the trials have been made available on-line to describe the rationale for PondNet, the size and shape of the network and to provide methodologies for each taxonomic group, species and environmental variable to be monitored.

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1. Introduction

1.1 Background

The UK has a long tradition of biodiversity monitoring and some of the longest running and most extensive biodiversity datasets in the world. However, the UK's best developed surveillance programmes tend to focus on the most conspicuous species (e.g. birds, butterflies), and there are many other taxa where systematically collected surveillance data are needed to support policy and protection.

Global estimates indicate that freshwater biodiversity is declining significantly faster (37% between 1970 and 2007) than its' marine and terrestrial counterparts (WWF 2012).Given the incomplete nature of recording, especially in under-recorded freshwater habitats such as ponds, current estimates are likely to be an underestimate of the decline.

The project '*Structured surveillance of small standing water bodies*', aims to explore the feasibility of using a volunteer-based habitat-centred approach for surveillance. Small water bodies are being used as an initial test of this approach which, if successful, could be applied to other habitats.

The proposal is that PondNet should:

- Provide robust and valid data to assess stock and change for widespread (occurring in >100 ten-km squares in England) and localised (16-100 ten-km squares in England) pond-associated species[1], for which England has international or national reporting responsibilities.

Ideally the network should also:

- Provide stock and change data for pond Habitats Directive habitat types[2] and Priority Ponds[3]
- Provide trend data that tracks wider countryside pond quality
- Provide habitat-centred data for more widespread species groups
- Provide surveillance trends for non-native species
- Provide data that can enable causes to be linked to observed change through analysis of environmental data.

To achieve its aims PondNet seeks to:

- Make use of existing networks and initiatives
- Cover the interests of each key taxonomic group
- Optimise the use of existing volunteers
- Provide the basis for feedback products to recorders
- Contain enough sites to provide statistically valid information on status and change
- Provide the basis for reporting on biodiversity outcomes for regional, national and European purposes
- Support the work of the recorder community through the development of new web-based tools and interfaces.

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[1] Pond-associated priority species defined under S41 of the Natural Environment and Rural Communities (NERC) Act 2006: common frog, common toad, great crested newt, marsh clubmoss, marsh stitchwort, pillwort, tassel stonewort, tubular water-dropwort, yellow centaury and pond mud snail.
[2] Habitat Directive Annex I habitat types: 3110 Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*), 3130 Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or *Isoeto-Nanojuncetea*, 3140 Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp., 3150 Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition* - type vegetation, 3160 Natural dystrophic lakes and ponds, 3170 Mediterranean temporary ponds.
[3] Priority Ponds are a priority habitat defined under S41 of the Natural Environment and Rural Communities (NERC) Act 2006.

1.2 Project structure

The project trial was led by Freshwater Habitats Trust (formerly Pond Conservation) working in close association with Amphibian and Reptile Conservation. Different elements of the project were funded by Freshwater Habitats Trust, Natural England, and Defra. Biological Records Centre (BRC) also contributed time to the data recording element of the project. The current report outlines the results of the Natural England and Freshwater Habitats Trust funded elements. Work completed for Defra is summarised in the report by Ewald et al (2014).

1.3 Project aims and objectives

This report summarises work undertaken by the end of Year 3 (2013/14) of the PondNet trial, "Multi-taxa structured surveillance of small standing water bodies", and outlines how the project may be implemented in the future. The project's overall aim was to test the potential to develop a statistically robust volunteer network (PondNet) for surveillance of ponds in England, based on regional trials in South Hampshire, Cheshire and North East Yorkshire.

To this end the trial had four main objectives:

- To understand the benefits of regional coordination in terms of volunteer recruitment and retention.
- To understand the benefits of training on volunteer recruitment and retention.
- To test the trial network against the original aims of the project to determine whether PondNet could provide the data needed for statistically robust analysis.
- To provide an outline of how PondNet could be rolled out nationally and provision of materials to ensure that PondNet could be taken on by others in the future.

2. Regional co-ordination of PondNet volunteers

2.1 Aim

To develop, establish and test methods which would increase PondNet volunteer effort and add to data provision through a regional coordinator.

The volunteer data from South Hampshire was compared with data gathered from North East Yorkshire (control region) to evaluate the effectiveness of South Hampshire's regional co-ordinator in terms of number of ponds surveyed, attributes measured, survey returns and data quality through comparison with QA results.

The South Hampshire co-ordinator would train, support and develop volunteers in the 2013 field season. Specifically:

(i) Train and retain additional active volunteers.
(ii) Develop a 'regional mentoring scheme' that paired-up local taxonomic experts and volunteers who were either new or wanted to expand their skills.
(iii) Collect additional data through increased on-site support.
(iv) Use these data to support and test methodology development for key species.
(v) Compare effectiveness of S Hampshire and NE Yorkshire.
(vi) Recommend improvements based on feedback from volunteers.

2.2 Activities

During summer 2012 and 2013, the South Hampshire Regional Coordinator undertook a range of activities to enhance the uptake and experience of volunteers in South Hampshire compared to the control region (North East Yorkshire).

This included:

- Additional recruitment through regional talks (e.g. Hampshire recorders meeting), local recording group meetings (Southampton Natural History Society, New Forest Study Group, Hampshire and Isle of Wight Wildlife Trust local groups) and events (New Forest Bioblitz and Hampshire Volunteer Fair).
- Double the number of training events (13 events) compared to the control region (6 events)
- Provision of an equipment pool, including pond nets, torches, invertebrate sorting trays, conductivity/ pH meters, and a draft guide to the identification of wetland plant species (extracted from the Vegetative Key to the British Flora).
- A 'regional mentoring scheme' was also established in South Hampshire to pair-up local taxonomic experts in wetland plants (John Poland), invertebrates (Robert Aquilina), amphibians (John Poland), dragonflies (Peter Allen) and BAP invertebrates (Graham Long) with volunteers who were either new or wanted to expand their skill base.

2.3 Results

The additional publicity, training and mentoring in South Hampshire delivered significant benefits in terms of both the number of active volunteers and the number of sites and attributes measured. The results are shown in Tables 1 and 2. However in summary, compared to the data for North East Yorkshire, South Hampshire had:

- 207% more volunteers trained (85 *vs* 41)
- 255% more volunteers that returned data (51 *vs* 20)
- 267% more 1km squares surveyed (56 *vs* 21)
- 55% more attributes measured (e.g. surveys of dragonflies, plants, environmental data, etc.) (164 *vs* 106)

Table 1. Comparison of volunteer numbers in the three trial regions in 2012/13

Volunteers:	South Hampshire		Cheshire		North-east Yorkshire		S Hampshire compared with NE Yorkshire	
	2012	2013	2012	2013	2012	2013	2012	2013
Number allocated 1 km squares	24	**77**	18	**76**	17	**46**	+41%	**+67%**
Number of training courses	2	**13**	2	**7**	2	**6**	+0%	**+116%**
Number trained	23	**85**	13	**57**	14	**41**	+64%	**+107%**
Number that surveyed squares and returned data	23	**51**	11	**26**	9	**20**	+156%	**+155%**
% retained from square allocation to submitting results	96	**66**	61	**34**	53	**43**	+81%	**+53%**

Table 2. Comparison of volunteer data collected from ponds in the three trial regions in 2012/13

Survey attributes		South Hampshire		Cheshire		NE Yorkshire		S Hampshire compared with NE Yorkshire	
Regional advisor?		**Yes**		**Partial**		**No**			
Year		**'12**	**'13**	**'12**	**'13**	**'12**	**'13**	**'12**	**'13**
Environmental data	Number of 1km^2 sq	37	**53**	15	**31**	6	**17**	+517%	**+212%**
	Number of ponds	74	**62**	17	**48**	11	**28**	+573%	**+121%**
Amphibians	Number of 1km^2 sq	18	**34**	3	**15**	4	**15**	+350%	**+127%**
	Number of ponds	23	**38**	5	**22**	10	**31**	+130%	**+23%**
Wetland plants	Number of 1km^2 sq	8	**5**	11	**12**	3	**10**	+167%	**-50%**
	Number of ponds	8	**5**	17	**19**	6	**14**	+33%	**-64%**
Aquatic invertebrates (family level)	Number of 1km^2 sq	8	**8**	3	**12**	2	**4**	+300%	**+100%**
	Number of ponds	8	**10**	4	**22**	3	**5**	+167%	**+100%**
Dragonflies (adult)	Number of 1km^2 sq	5	**9**	-	**3**	-	**3**	-	**+200%**
	Number of ponds	5	**9**	-	**3**	-	**5**	-	**+80%**
Birds	Number of 1km^2 sq	10	**3**	1	**2**	2	**1**	+400%	**+200%**
	Number of ponds	10	**3**	1	**3**	2	**1**	+400%	**+200%**
Pillwort	Number of 1km^2 sq	13	**14**	-	**-**	1	**4**	+1200%	**+250%**
	Number of ponds	20	**14**	-	**-**	5	**4**	+300%	**+250%**
Tubular water-dropwort	Number of 1km^2 sq	4	**1**	8	**4**	-	**6**	-	**-83%**
	Number of ponds	5	**1**	19	**7**	-	**11**	-	**-91%**
Yellow centaury	Number of 1km^2 sq	4	**2**	-	**-**	-	**-**	-	**-**
	Number of ponds	16	**2**	-	**-**	-	**-**	-	**-**
Coral necklace	Number of 1km^2 sq	4	**3**	-	**-**	-	**-**	-	**-**
	Number of ponds	19	**3**	-	**-**	-	**-**	-	**-**
Marsh clubmoss	Number of 1km^2 sq	-	**6**	-	**-**	-	**-**	-	**-**
	Number of ponds	-	**6**	-	**-**	-	**-**	-	**-**
Mud snail	Number of 1km^2 sq	6	**5**	3	**4**	1	**4**	+500%	**+25%**
	Number of ponds	12	**10**	8	**5**	5	**4**	+140%	**+150%**
Other	Number of 1km^2 sq	1	**1**	-	**-**	-	**1**	-	**0%**
	Number of ponds	1	**1**	-	**-**	-	**3**	-	**-67%**
Total number of sites surveyed	**Number of 1km^2**	41	**56**	17	**37**	9	**21**	356	**+167%**
	Number of ponds	76	**65**	43	**51**	20	**46**	280	**+41%**

In terms of the multi-taxa approach (Table 3) the benefits of a regional officer were less clear. In South Hampshire 29% of volunteers recorded multiple taxa, whereas 40% of volunteers in NE Yorkshire recorded multiple taxa. So although the number of volunteers engaged was higher in Hampshire the preference of these volunteers was to concentrate on recording one taxonomic group.

In NE Yorkshire although the number of volunteers participating was lower they were more inclined to visit more sites. In South Hampshire only 12% of volunteers visited more than one square, whereas in NE Yorkshire 35% of volunteers visited more than one square.

Analysis of the amphibian surveys showed that there may be a trade off between the amount of work required at each pond and the number of ponds surveyed per square:

- 7% more volunteers undertook multiple visits to the same pond (48% *vs* 41%)
- 30% fewer volunteers surveyed multiple ponds (7 *vs* 10)

Table 3. Comparison of volunteer multi-taxa surveillance data collected in the three trial regions in 2013

Volunteers:	South Hampshire	Cheshire	North-east Yorkshire
Surveyed multiple taxa	15 (29%)	10 (38%)	8 (40%)
Surveyed multiple squares	6 (12%)	5 (19%)	7 (35%)
Surveyed multiple ponds per square	7 (14%)	15 (58%)	10 (50%)
Undertook multiple visits to the same pond	19 (48%)	3 (27%)	3 (43%)

2.4 Discussion

Comparison between the regions
Volunteer retention was significantly higher (χ^2=5.99, p<0.001) in South Hampshire (66%), compared to North-east Yorkshire and Cheshire, where less than half the volunteers went on to compete the survey. The greater retention in South Hampshire is likely to be a direct result of:

- Local liaison with organisations with good links to the volunteer community.
- More training courses available.
- Provision of equipment.
- On-going volunteer support and mentoring through both trial years.

Volunteer feedback to improve the scheme
Volunteer feedback was examined in detail through questionnaires as part of the Defra funded element of the work and have been discussed in the final report for the project (Ewald et al. 2014).

The key findings were:

- Overall 74% of volunteers felt well or very well supported in their role as a volunteer and 63% felt highly or very highly valued.
- Over 90% said that the training they received gave them the skill they required to undertake the survey, although 8% felt they needed more practice and training to be confident on the techniques being used and their species identification. All volunteers found the field techniques and survey forms easy to use.
- Going forward, when asked what would improve their experience of PondNet, most volunteers (between 70% and 90%) would like to see more training in survey techniques and

species identification, and provision of a good field guide for aquatic plants and invertebrates. Another c.70% wanted more opportunities to interact with other PondNet surveyors.

- Between 60% and 70%, would like improvements in the on-line data entry and detailed feedback from this system, including how survey data are used.
- c.60% felt that they would like more provision of free or subsidised survey equipment.
- Ultimately, over 80% of the 2013 volunteers said they would definitely continue with PondNet and over 70% would like to continue with the site they had already been allocated; 64% wanted to develop their multi-taxa skills.

3. Regional training courses for PondNet volunteers

3.1 Aim

To provide additional resource to support volunteer training in the Cheshire region that would increase PondNet volunteer effort and add to data provision in 2013.

The Cheshire co-ordinator would train, support and develop additional volunteers in the 2013 field season. Specifically:

(i) Train new volunteers i.e. volunteers that have come forward since the original regional training days in April/May.

(ii) Provide survey square permissions and site data for additional volunteers.

3.2 Activities

During summer 2013, the Cheshire Regional Coordinator undertook a range of activities to encourage recruitment of volunteers in Cheshire compared to the control region (North East Yorkshire). This was achieved through links with the local wildlife trust and other wildlife recording groups, institutions and local media. On-going support was only provided in the form of:

- Training materials available on-line.
- Provision of an equipment pool, including pond nets, torches, invertebrate sorting trays, conductivity/ pH meters, and a draft guide to the identification of wetland plant species (extracted from the Vegetative Key to the British Flora).

3.3 Results

The recruitment drive in Cheshire and increase in training compared to the previous year (2 training courses 2012; 7 training courses 2013) increased the number of volunteers recruited, but without on-going support and mentoring it did not increase the number of volunteers retained in comparison with the control region (North-east Yorkshire). The results are shown in Tables 1, 2 and 3. However in summary, compared to data from North East Yorkshire and data gathered in the previous year, Cheshire had:

- 350% more training courses in 2013 compared with 2012 (7 *vs* 2)
- 165% more volunteers recruited in Cheshire compared to the control region in 2013 (76 *vs* 46)
- 139% more volunteers trained in Cheshire compared to the control region (57 *vs* 41)
- 182% more attributes measured than in previous year (e.g. surveys of dragonflies, plants, environmental data etc), (129 *vs* 71)

3.4 Discussion

Comparison between the regions

In Cheshire, a regional co-ordinator was in place for the second year only. This was significant in increasing the number of recruits compared to the previous year when no officer was in post. The

significantly lower submission rate (34%) compared to Hampshire (66%) is likely to have resulted from differences in the aspirations of volunteers signing up for training. Liaison with the Cheshire Wildlife Trust attracted a large number of participants who received training but did not complete volunteer surveys, because they were minded to survey Wildlife Trust sites.

- There is a need to allow local volunteers to submit records for sites which they are interested in, as well as the MTSS network.

4. Explore the future potential for PondNet

4.1 Aim

We aimed to evaluate the PondNet trial and investigate and assess options for PondNet going forward, including full national roll-out, local operating models, roles of partner organisations and integration with habitat surveillance.

4.2 Activities

- We tested the trial network against the original aims of the project to determine whether PondNet could provide the data needed for statistically robust analysis.
- We discussed the options with Hampshire partners including the Local Record Centre to discuss how local coordination could be maintained within a national network.
- We undertook a workshop with the project partners to explore the future of PondNet as a national network.
- We developed scenarios for network maintenance based on various reporting requirements.
- We provided costed scenarios for roll-out based on the reporting scenarios.

4.3 Results and discussion

4.3.1.Test the trialled network against the original aims

A full analysis of the PondNet approach against the original aims is included in the Ewald et al (2014) report. But we provide a summary of the findings here:

(i) Were enough sites/ponds sampled?

In summary, the results of the PondNet trials showed that it should be possible to achieve the original aims of the network in terms of numbers of sites (Table 4). However, more emphasis is needed to:

- Ensure that volunteers visit all ponds in the square
- Visit squares which are less desirable because they do not contain an enigmatic species

(ii) Was the quality of the data good enough?

The results of QA were variable; good for environmental and amphibian species and S41 restricted species, but requiring expert volunteers for plant species richness and invertebrate taxa. Birds as a group did not fit well with the PondNet approach. To improve the quality of data in the short and medium term:

- Ensure that volunteers visit sites more than once in the season to comply with species survey protocols.
- Automate as much as possible environmental variables (e.g. pond area) to prevent volunteer bias.
- Provide training videos on line to help with species survey techniques.

- In the short term: direct expert volunteers towards ponds to plug gaps in the dataset. This would, in addition, provide a good baseline, which experience in PondNet shows, can encourage moderately skilled surveyors to achieve more accurate species lists.
- In the longer term: training, increasing surveyor skills and on-going QA is required to increase the pool of surveyors with the necessary level of surveying expertise. For surveyors with moderately good skills, targeted training courses or expert mentoring is likely to be a good option.

Table 4. Numbers of 1 km squares which could be visited if trial square totals were scaled up to national level

	PondNet total in 2013	PondNet total scaled to national	National target	% of national target achieved by PondNet in 2013 if scaled to national
Random squares	38	532	188	283%
Great crested newt squares	25	350	188	186%
Common toad squares	20	280	164	170%
Priority ponds	14	196	50	392%

4.3.2. Options discussed with Hampshire Biodiversity Information Centre

A meeting was held in January 2013 to discuss with a Local Record Centre (Hampshire Biodiversity Information Centre) the outcome of the PondNet trials and to understand activities which would be possible immediately and any barriers and constraints to rolling the project out through LRCs.

Co-ordination activities fall into 3 main categories:

- *Network development:* understanding the PondNet approach to ensure statistically robust, valid results collected to a standardised methodology.

  Training the trainers: to ensure a consistent approach in each of the regions, all levels need a clear understanding of the PondNet approach in terms of: site selection, species methodologies, steps required pre and post training, data input and data flow.

  Feedback suggested that the existing on-line materials for PondNet were clear and concise, but issues would remain around data flow and identifying a member of staff who could take on the role of coordinator in addition to existing workloads.

- *Site selection:* setting up the network to validate site selection, identify overlaps with existing initiatives, gain on-going site permissions and compiling site information to allow volunteers to make informed decisions about the sites they want to survey.

  Feedback suggested that there was no capacity currently with the LRC to take on the whole of this role. However, in the short term it would be possible to validate the site selection (e.g. site known for Great Crested Newt), determine where there were overlaps with the PondNet network and existing initiatives at a local level, organise permissions where they overlapped with an existing initiative, accommodate a portal for on-line data entry.

- *Volunteer support:* volunteer recruitment, training and support to ensure correct use of methodologies, understanding of environmental metrics and up-skilling of species identification, provision of equipment, mentoring, ongoing queries and QA.

  This is a large on-going element of the PondNet network and in trials has been shown to be a pivotal element of the project's success. For LRCs associated with a wildlife trust or for those who co-ordinate a local species group this may be feasible in the medium term.

However, for LRCs who are largely funded by local planning authorities and who traditionally have not engaged with the volunteer recording community in this way, it would require an additional post (with associated capacity (space) issues).

4.3.3. Workshop to explore future potential of PondNet

A workshop was held in Bristol on 18th – 19th March 2014. The aim and focus of the workshop was to bring together representatives from the projects, Local Record Centres, and national schemes and societies, to draw out the key challenges and opportunities, and identify the road ahead.

PondNet and the role of Species Groups and Local Record Centres were a focus for much of the discussion at the workshop; particularly the potential for transition of (a) further development of Multi-taxa structured surveillance (MTSS) in collaboration with Species Groups and (b) co-ordination and support of PondNet moving to Local Record Centres. To facilitate this, the workshops were held over two days:

Day 1: Review of the structured surveillance trials and ways forward -species groups potential roles in MTSS
Day 2: Taking structured surveillance forward with LRCs. How LRCs might be able to support the roll out of structured surveillance in the (a) short (b) long term

Overview:

- 29 delegates attended a 2-day workshop
- Presentations are available online www.freshwaterhabitats.org.uk/projects/pondnet/project-reports/multi-species-surveillance-workshop-bristol-2014
- Digestion of workshop sessions summarised and distributed to delegates

In summary:

(i) Response to the Multi-taxa Structured Surveillance approach

Workshop delegates generally agreed that the MTSS approach has merit, but there are a range of caveats that need to be addressed, particularly if LRCs are seen as regional co-ordination hubs. Key recommendations include:

- Make the vision for MTSS, and steps to reach it, clear and simple.
- Give advanced warning of planned changes.
- Use a staged approach moving a step at a time towards the vision.
- Ensure pilots are long enough, and don't try to answer too many questions.
- Clearly and simply define the aims, targets and end-points for surveillance: is the aim to monitor priority species or functional groups e.g. pollinators?
- Ensure sufficient funding, for coordination as well as deliverables. There is a real lack of capacity within LRCs, and online recording/ efficiencies in data management will not release existing resource for MTSS in the short term.
- Make a lasting commitment to this change of approach.

(ii) Response to the involvement of national recording schemes

There needs to be a close link with National Recording schemes, but with a working product for species groups to engage with. Some National Recording Schemes may be wary of:

- The quality of data collected through MTSS as they are sceptical of the ability of volunteers to record such a range of taxa.
- MTSS becoming a competing approach that does not align with the national and local recording schemes and pulls volunteer resource away from their own activities.
- The competing pressures of dealing with MTSS alongside their normal work load.

(iii) Response to national recording schemes and network co-ordination

There is potential for co-ordination to create an overlap of species recording in the same squares, particularly as a lot of species groups allocate randomly selected 1km grid squares for local and national monitoring schemes.

- There is a critical need to identify where relevant existing monitoring squares are at a local level during site selection of new schemes.

(iv) Suggestions to improve and streamline MTSS roll-out

Pilot schemes have identified that several elements of MTSS schemes could be automated to reduce the amount of volunteer coordination and provide more support and feedback to volunteers. This could be adapted for each scheme but suggestions include:

- *Volunteer sign-up using a map-based on-line tool.* For MTSS, survey squares are selected at random and then volunteers are allocated one or more squares. Different volunteers have different taxonomic skills/interests and may be willing to travel more or less far to undertake a survey. Thus, square allocation can be time consuming for the scheme coordinator and may create delays for volunteers. Site selection could be automated. For example, scheme squares, taxonomic groups to be surveyed in the scheme in each square, etc. are made available on-line. Volunteers are then able to choose from this map based on-line tool and sign up on-line for a square or taxonomic group within the square. Details of site access, landowner permission would then be sent out to the volunteers. In this way, volunteers are able to choose which sites they want to visit, square already allocated to a volunteer will be visible on the map, multiple volunteers with different taxonomic skills may sign up for the same square, or volunteers with particular expertise may sign up for multiple squares.

- *Environmental variables calculated in advance of survey.* PondNet trials revealed that the accuracy with which environmental parameters such as pond area, percentage of land use type surrounding the pond and number of ponds within a set radius could be improved if calculation was made in advance of the survey using GIS and then verified in the field by the volunteer.

- *Feedback to volunteers.* MTSS pilots and previous volunteer schemes continue to show that feedback is essential to maintain volunteer motivation and support for the scheme. Continued improvements in species recording tools allow this feedback to be instantaneous and tailored to the user and may comprise both national and local elements.

- *Tools and standard practice guides.* To maintain survey standards, particularly where national schemes are coordinated at a local level MTSS protocols will be made available on-line. This could include instructional videos and species identification tools.

(v) Suggestions regarding the expert resource

Species experts (e.g. regional BDS or BSBI co-ordinators), are often busy people already involved in Atlas work and verifying records. A suggested option was to develop a tiered system to use experts most effectively. Specifically:

- Encourage experts to become more comfortable with training (may be over a period of years, with gentle steering).
- Training: use experts to undertake training courses across all skill levels.
- Mentoring and other support:
  - *New inexperienced volunteers*: use high quality on-line resources (methodology and ID videos, bespoke field guides), photos from flickr, plus support groups/online forums. Potentially mentored by volunteer 'sub-experts'.

- o *Volunteers with moderate or good skills* and a proven volunteer track record: offered bespoke training Develop/invest in these keen volunteers e.g. Bristol Museum ID workshops aimed at up-and-coming recorders.
- o *Use experts* for high level mentoring of the best semi-expert volunteers.
- LRCs can provide links to local experts and species recording groups. It may be worth investing in paid experts, rather than relying on volunteers.

(vi) Response to Local Recording Centres taking a co-ordinator role

Many LRC's already undertake a lot of the activities that would be involved in co-ordinating the MTSS network, such as volunteer recruitment, and data capture/management; the local knowledge and links which LRC's are an invaluable tool. Funding and resources were highlighted as a major barrier and it was suggested that a paid Volunteer Co-ordinator role at LRC's would be highly beneficial.

- *Landowner Permissions* - To gain landowner permissions, local level co-ordination is vital and LRC's may be particularly well placed to take on this role. However, it was noted that whilst starting with statistically robust survey designs, accessibility constraints may make it difficult to achieve a random network. Suggestions to help gain site access include:
- Providing volunteers with a basic letter they may be able to obtain permission from the landowners themselves.
- Starting the network off with volunteers who are surveying self-selected sites and then scaling up from there in future years.
- *Survey packs* - The creation of survey packs for volunteers may be time consuming for LRC's. If an automated process is used then this can largely be a one-off task. It was also suggested that an ALERC dropbox folder could be used for sharing information.
- *Identifying sites needed to complete the network* - Local knowledge of habitats can be used to identify sites, provided these conform to a randomly chosen network. However, it should be noted that the motivation of LRC's is generally towards locally significant sites, which would result in bias.
- *Data capture* - A preferred option amongst some LRCs is that volunteers submit data online to LRC's who can then verify and add value, this data can then be fed into the NBN. Additionally, for other LRC funding partners access to up-to-date, information of known quality is critical. Data portals need to allow flow of data to LRCs and to national schemes.
- *Volunteer recruitment* - It was noted that this is often best done through training courses. LRC's can also advertise through local groups. Many LRC's are linked to Wildlife Trusts, which is a potentially good source of volunteers.
- *Queries and verification* - There should be clarity of roles so that queries are directed to the appropriate person straight away. The use of automated rule sets to verify data would be useful. All data should be accepted (we don't want to discourage novices), however, it is important that quality of data is known.

4.3.4. Network structure

The same PondNet sites will be visited annually and data used to report on stock and change in the distribution of very widespread species, change in pond quality, change in the status of great crested newt and common toad, and change in populations of localised plant and invertebrate species.

- The size of the network means that data are statistically valid to report on significant changes
- If no change is observed between individual years the size of the network allows reporting on no more than 30% change with 70% power.

- Analysis of trends over time, visiting the same sites on an annual basis, will allow smaller changes to be detected with greater power.
- Larger networks will allow reporting with greater confidence that smaller changes have not occurred.
- Self-selected sites at a local level will allow further analysis, e.g. no change within reserves compared with the wider countryside, positive change observed following changes in management policy etc.

A priori analysis of existing data on the distribution and between year variability of key species of conservation concern, and metrics for the assessment of pond habitat quality, revealed that a statistically valid network would need to include:

- A core surveillance network of c. 550 squares comprising:
    - c.200 randomly selected 1 km grid squares to monitor stock and change in the distribution of **very widespread pond species** and to assess and explore **change in pond quality** using plant, animal and environmental metrics.
    - a network of c.350 1 km grid squares, known to support great crested newt or common toad, which combined with the random network above could be used to monitor stock and change (presence/absence) in **widespread amphibians,** including great crested newt and common toad.
    - c.50 **Priority Ponds** to monitor change in the condition of this S41 habitat type, ensuring that there is no decline in the quality of priority pond sites.
- An S41 species network:
    - To monitor change (as abundance) in populations of **localised plant and invertebrate** species. This is likely to be approximately 50 sites for each species.
    - These sites may overlap with each other and with the core network, although preliminary assessment suggests that this may happen rarely, due to the paucity of sites and specific habitat requirements of these species.
- A self-selected network:
    - A range of partner organisations (e.g. Cheshire Wildlife Trust) and volunteers (e.g. Friends of Long Meadow Group) were keen to include self-selected sites on PondNet, surveyed using the same standardised methodologies. After discussion within the project, it was agreed that including such sites would be beneficial because:
        - Self-selected sites, which are typically high quality ponds in protected areas, provide useful additional data which can be included in national analyses for the assessment of Priority Ponds, and provides useful information at the local level for protecting and managing individual sites.
        - In some cases, including self-selected sites allowed PondNet to recruit volunteers from other organisations as a trade-off between providing data that could be used in PondNet and increasing the skills of the organisation's volunteers.
    - The current aim is to tag self-selected site records within the data entry portal so that they can be excluded from the randomly selected network to avoid a predominance of protected sites, which would skew the results of analysis.

4.3.5. National/local organisational roles

To develop a sustainable and robust network, the project needs to be coordinated at both national and local levels (Figure 1). An option for this approach could be as follows:

National coordination roles could comprise:
- Ensuring standards are maintained across the network in terms of survey methodologies and site selection

- Liaison with national societies to streamline the network and identify other key S41 plant and invertebrate species for abundance monitoring
- Maintaining national web-tools for site selection and data entry, including feedback to volunteers through the shared hub
- Analysis of results for reporting against statutory targets, using data to protect and enhance the freshwater resource
- To undertake random periodic expert surveys to ensure quality assurance of the PondNet approach.

Local coordination roles could comprise:

- Streamlining the network at a local level by selecting sites already monitored by local organisations and groups.
- Recruiting, training and retaining volunteers, including mentoring to develop volunteers' skills.
- Arranging site access, undertaking site risk assessment and producing site survey packs.
- Providing and maintaining equipment for volunteers.
- Identifying local expert volunteers able to complete surveys for difficult taxonomic groups.
- Dealing with on-going volunteer queries.

Figure 1. An option for the long term organisational structure of PondNet
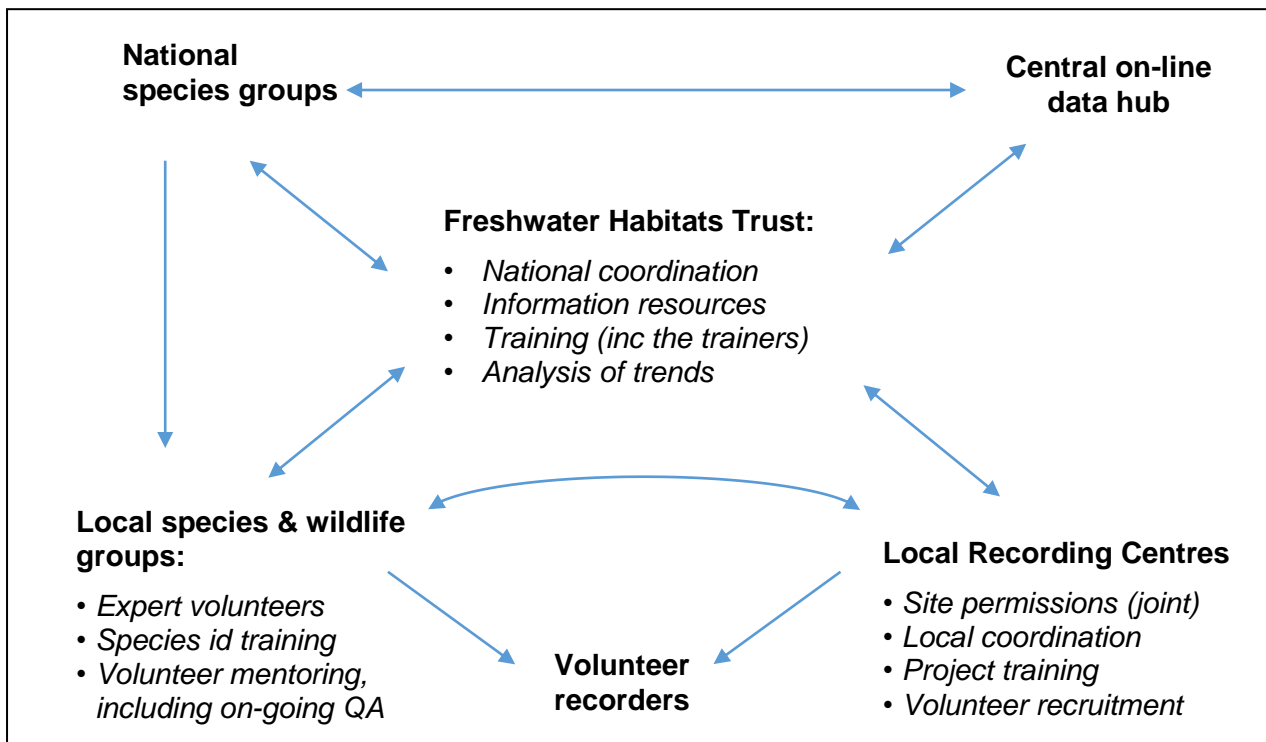
4.3.6. Costed scenarios for roll-out of PondNet at a national scale

Given the suggested reporting scenarios and organisational structure above we itemised the activities needed to set-up and run PondNet (Table 5) based on a Local Record Centre (LRC) undertaking the local coordination with national coordination undertaken by Freshwater Habitats Trust (FHT).

- In summary start-up costs on average for each LRC would be 0.4 FTE for Year 1 costs.
- On-going costs on average for each LRC would be 0.2 FTE per LRC per year.

- FHT would require 2 FTE per year for 3 years to provide coordination/support.

Assuming ALL the remaining 44 LRCs participate a in 3-yr national roll-out plan to ensure full coverage, of which 4 are already running by end of 2014/15, then indicative LRC costs could be calculated for the next 3 yrs as follows (equipment costs would be additional):

Table 5. Costed scenarios for PondNet start-up and ongoing costs for LRCs

	2015/16 Resource requirement (FTE)	2016/17 Resource requirement (FTE)	2017/18 Resource requirement (FTE)	2018/19 onwards resource requirement (FTE)
'Pilot' LRCs (1-4) established during 2014/15	2 x 4 = 0.8	0.2 x 4 = 0.8	0.2 x 4 = 0.8	0.2 x 4 = 0.8
First Tranche of 15 LRCs (5-19)	0.4 x 15 = 6.0	0.2 x 15 = 3.0	0.2 x 15 = 3.0	0.2 x 15 = 3.0
Second Tranche 15 LRCs (20-34)		0.4 x 15 = 6.0	0.2 x 15 = 3.0	0.2 x 15 = 3.0
Third Tranche LRCs 14 (35-48)			0.4 x 14 = 5.6	0.2 x 14 = 2.8
TOTAL LRC FTE costs	**6.8**	**9.8**	**12.4**	**9.6**

5. *Ensure the main PondNet elements are standalone so that others can take project forward*

5.1 Aim

We aimed to produce a suite of materials documenting PondNet and how to manage it so that others could pick it up in future.

5.2 Activities

- Project support materials available on-line
- Site list generated for each county
- Project start-up protocols agreed and provided on-line
- Final report of trials completed and available on line

5.3 Outputs

5.3.1. Project support materials available on-line

Volunteer survey protocols and recording sheets were developed for all attributes recorded in the survey. Wherever possible, survey methodologies were based on those currently used by partner organisations. This maximised the data compatibility between schemes and increased the value of data collected both for partner organisations and PondNet.

An on-line toolkit was developed for use by volunteers, other organisations and future PondNet roll-out (Figure 1) www.freshwaterhabitats.org.uk/projects/pondnet

The toolkit provides a volunteer starter pack which includes an overview of the PondNet project, health and safety information, biosecurity best practice, volunteer agreement and lone working code of practice. Additional materials include, for each element of the project (environmental variables, taxonomic group, etc.): a training presentation, guidance on species identification, survey methodology and survey forms.

5.3.2. Site list generated for each county

Given the findings of the current study sites for the core network (see Section 4.3 (iv) pg. 12) have been selected at random at a national level (Tables 6). The number of squares allocated to each county is proportional to county size.

At a local level, the core network should overlap with existing volunteer surveillance schemes where possible (e.g. British Dragonfly Society), to minimise the demands placed on a limited pool of volunteers (especially experts in specialist taxonomic groups) and to maximise synergy between surveys. There is therefore flexibility within the scheme to identify already randomly chosen sites to fulfil the quota at a local level.

In addition, to accommodate volunteer drop-off in future years, local schemes are encouraged to randomly select additional sites which fulfil the criteria based on local knowledge.

There is potential to supplement the core network with a peripheral network of self-selected sites (chosen by organisations or individuals) which can be included in analyses:

- Where they provide additional data to support evaluation of national trends - e.g. for high quality sites, locations under environmental stewardship schemes, etc.

- At regional and local levels where the data can help to fill long-established gaps in knowledge such as the effects of pond management.

Selection of the network for localised S41 plants and invertebrates will be dependent on the occurrence of these species in each county to achieve the target of c.50 ponds per species at a national level.

Table 6. Summary of minimum square targets based on proportional size of counties

Row Labels	GCN Squares	Toad Squares	Random Squares	TOTAL SQUARES	Area (km sq)	%
Bedfordshire	2	2	2	6	1235	0.956904
Berkshire	2	2	2	6	1262	0.977825
Bristol	1	1	1	3	110	0.08523
Buckinghamshire	3	3	3	9	1874	1.452015
Cambridgeshire	5	5	5	15	3390	2.626645
Cheshire	7	3	4	14	2343	1.815407
Cleveland	1	1	1	3	583	0.451721
Cornwall	0	5	6	11	3563	2.760689
Cumbria	10	9	10	29	6767	5.243216
Derbyshire	4	4	4	12	2625	2.033906
Devon	10	9	10	29	6707	5.196727
Dorset	4	4	4	12	2653	2.055601
Durham	4	4	4	12	2721	2.108289
East Riding of Yorkshire	4	3	4	11	2479	1.920782
Essex	6	5	6	17	3670	2.843595
Gloucestershire	5	4	5	14	3150	2.440687
Greater London	3	2	3	8	1569	1.215695
Greater Manchester	2	2	2	6	1276	0.988672
Hampshire	6	5	6	17	3769	2.920302
Herefordshire	3	3	3	9	2180	1.689111

Row Labels	GCN Squares	Toad Squares	Random Squares	TOTAL SQUARES	Area (km sq)	%
Hertfordshire	3	2	3	8	1643	1.273032
Isle of Wight	1	1	1	3	380	0.294432
Kent	6	5	6	17	3736	2.894733
Lancashire	5	4	5	14	3075	2.382576
Leicestershire	3	3	3	9	2156	1.670515
Lincolnshire	11	10	11	32	6959	5.391982
Merseyside	1	1	1	3	645	0.49976
Norfolk	8	7	8	23	5371	4.161566
North Yorkshire	13	12	13	38	8608	6.669663
Northamptonshire	4	3	4	11	2364	1.831678
Northumberland	8	7	8	23	5013	3.88418
Nottinghamshire	3	3	3	9	2159	1.672839
Oxfordshire	4	4	4	12	2605	2.01841
Rutland	1	1	1	3	382	0.295982
Shropshire	5	5	5	15	3488	2.702577
Somerset	6	6	6	18	4170	3.231005
South Yorkshire	2	2	2	6	1552	1.202523
Staffordshire	4	4	4	12	2714	2.102865
Suffolk	6	5	6	17	3800	2.944321
Surrey	3	2	3	8	1663	1.288528
Tyne and Wear	1	1	1	3	540	0.418404
Warwickshire	3	3	3	9	1975	1.530272
West Midlands	1	1	1	3	902	0.698889
East Sussex	3	2	3	8	1791	1.387705
West Sussex	5	3	3	11	1990	1.541895
West Yorkshire	2	1	1	4	229	0.177434
Wiltshire	5	5	5	15	3485	2.700253
Worcestershire	3	2	3	8	1741	1.348964
Grand Total	**202**	**181**	**202**	**585**	**129062**	**100**

5.3.3. Project start-up protocols agreed and provided on-line

The coordination role is comprised of 3 main elements a) understanding the PondNet approach to ensure statistically robust, valid results collected to a standardised methodology, b) setting up the network to identify sites, gain on-going site permissions and compile site information to allow volunteers to make informed decisions about the sites they want to survey and c) volunteer training and support to ensure correct use of methodologies, understanding of environmental metrics and up-skilling of species identification.

The general principles (Table 7) are available on-line www.freshwaterhabitats.org.uk/projects/pondnet/project-reports and in 2014/15 will form the basis of a trial roll-out to selected LRCs: Hampshire, Cheshire, North-east Yorkshire and Sussex.

Table 7. Project start-up protocols

	Tasks	Activity	Comments
a) Training the trainers:	PondNet methodology	Key representatives in each LRC are trained in the principles of the PondNet approach and steps required.	
b) Setting up the network – initial set-up in year 1, and on-going but to a lesser extent in future years	Site selection	Review list of nationally selected squares	Ensure that these are valid for the species (e.g. known for great crested newt, etc.)
		Overlay existing initiatives using random site selection (e.g. national recording scheme squares, LRC surveys, other local surveys)	Manipulate nationally selected squares to achieve most parsimonious network of randomly selected sites
		Identify additional squares which have value at the local level	Add these to the network, but classify as self-selected rather than part of the random network
	Landowner permissions	Organise landowner permissions for PondNet sites	Standard pro-forma provided to ensure consistency of approach, to comply with data protection, etc.
	Site survey packs	Prepare site survey pack for each square following site visit	Standard pro-forma to ensure consistency, to comply with H&S etc. To include: e.g. square map, identification of focal pond, species of interest in focal pond, identification of other ponds, site permission information (incl. contact details), access information, H&S issues.
	Data flow	PondNet data to be entered onto national database – data can be extracted at a local level as required	Identify key recorders to verify records at the local level
c) Volunteer engagement:	Volunteer recruitment	Ensure that all site information is available on 'pick your own square' on-line tool.	This should include PondNet core network as well as self-selected sites.
		Advertise PondNet to recruit volunteers	Advertise PondNet through existing and new networks - two recruitment periods March/April and June/July.
	Volunteer training and mentoring	Minimum 5 training events per LRC region per year	Local PondNet coordinator provides training on PondNet approach and species methodologies for PondNet
			Local species experts identified who could provide training and on-going mentoring for PondNet volunteers.
			Volunteers to be trained to use standardised PondNet methodologies for relevant taxa, e.g. amphibians/ dragonflies.
	Equipment	Identify existing equipment resource and the resources which would be needed for PondNet.	Possibility for LRC to act as exchange hub (pick up/drop off point) for volunteers to swap PondNet equipment.

	Tasks	Activity	Comments
	On-going queries	Continued engagement with PondNet volunteers to feedback information and deal with on-going site and survey queries	Maintain links between all volunteers both through social media and feedback from shared data entry hub.
			Share on-going queries between local and national coordinators depending on nature of the query (e.g. site queries, methodology queries).
			Have additional sites available to accommodate changes in access and volunteers throughout the life of the project.
	QA	Aim to QA c.10% of PondNet sites in each region.	Identify local experts who can undertake QA surveys and enter onto separate area of the shared portal

5.3.4. Final report of trials completed and available on line

Williams P, Ewald N, Biggs J, Wilkinson J. 2013. Biodiversity of ponds: developing and testing new approaches to data collection in the voluntary sector. Year 1 interim report to Defra. Pond Conservation, Oxford. Project code WC1043. Pond Conservation, Oxford.
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