

Herefordshire Amphibian and Reptile Team (HART)

Herefordshire Ponds and Newts Project (L+/023)

Final Report

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SUMMARY

- The Herefordshire Ponds and Newts Project was launched in August 2003 with aim of surveying at least 250 ponds within the Herefordshire Rivers which adjoins the rivers Wye, Frome, Lugg and Arrow covers 880 square kilometers and occupies 41% of the county. The project ended in November 2006.
- The primary aim was to assess amphibian occurrence and pond condition. The main target species was great crested newt which is a biodiversity action plan species both locally and nationally. Other objectives included the creation of a county pond data-base and the production of an atlas and the increased awareness of the wildlife and heritage value of Herefordshire's ponds and to encourage proper care and maintenance of ponds.
- The project was conceived as a community-based project. We relied on farmers and other landowners to put forward ponds for survey and management advice. In order to reduce bias we always attempted to survey all ponds on each landholding, rather than pre-selecting the best looking ponds. We also sort to engage the local community in carrying the survey work. In order to achieve these targets we produced a publicity leaflet, staged a project launch, wrote to every parish within the Herefordshire Rivers area and contacted all the relevant conservation bodies in the area. Twenty eight publicity events were also held ranging from a display at the Three Counties Show in Malvern to local parish displays.
- Twelve training events were held across the Herefordshire Rivers area and 124 people were trained enabling them to carry out surveys for the specially protected great crested newt under the Project Consultant's licence. The amphibian survey form was a modified version of that in the *Great Crested Newt Conservation Handbook* (Froglife, 2001). The pond survey form was devised to assess habitat suitability for great crested newts and is similar to that devised by Oldham et.al. Seventy six volunteers carried out one survey or more representing half of the trained volunteers.
- A total of 286 ponds have been surveyed with good coverage throughout the Herefordshire Rivers area. The Project generated 606 amphibian records. Forty six percent of all ponds visited were found to support the great crested newt. Forty eight percent of ponds supported smooth newt and 29% of ponds supported palmate newt. Thirty ponds supported all three species of newt representing 10.5% of all ponds. In addition, 49% of ponds supported common frog, 32% of ponds supported common toad and two ponds were found to support the introduced marsh frog. Seventeen percent of ponds have been visited more than once.
- The assessment of the habitat suitability indices found that water quality within ponds sampled was generally below average and ponds with poorer water quality are less likely to support great crested newts. Pond density with the Herefordshire's Rivers was shown to be very variable. 16% of ponds are located within 1 Km squares with 4 or more ponds. Conversely about 20% ponds in the LEADER area had no other ponds in their 1 Km square. All ponds with good terrestrial habitat supported great crested newts and overall there did appear to be a correlation between newt occupancy and good or moderate terrestrial habitat.
- Overall a third of all ponds with great crested newts were in good condition and a third of ponds were in average condition. Significantly 20% of ponds were found to be poor or below average condition as opposed to just 7% of ponds with great crested newts being in excellent condition.
- The project also gathered 1501 aquatic plant records and recorded a total of 137 species. 1218 aquatic invertebrate records have also been generated with a total of 163 species. This includes 583 water beetle records with 94 species recorded within the Herefordshire Rivers area. Most significant in this respect was the discovery of the specially protected fairy shrimp on Hergest Ridge near Kington and specially protected medicinal leech and Red Data Book 2 (RDB 2) at the Bulmer's nature reserve, Staunton-on-Wye.

- All the data gathered has been passed onto the Herefordshire Biological Records Centre. All the project's objectives were achieved.
- A 72 page reptile and amphibian atlas of Herefordshire has been written by Will Watson, Project Consultant, Nigel Hand, HART Reptile recorder and Phyl King, HART amateur naturalist and Newsletter editor. It features an account on Herefordshire ponds, distribution maps and a wide selection of colour photographs. The atlas is published and distributed by the Herefordshire Biological records Centre.
- The status of great crested newt within the Herefordshire Rivers is widespread with the species being found in 46% of ponds. This is very high pond occupancy for this species and there are few other places in the country known to support so many crested newt ponds at such high densities. Nationally, this ranks Herefordshire alongside counties such as Worcestershire, Warwickshire, Cheshire and Gloucestershire, Kent, Sussex and Essex.
- Over half of the ponds in the Herefordshire Rivers are in sub-optimal condition; population size is likely to be low. Small populations are particularly vulnerable to habitat change and genetic isolation and the species will be more vulnerable to local extinctions where there are fewer ponds and where habitats are sub-optimal. Habitat management of great crested newt ponds involving such practices as shade reduction, de-silting and improving water quality will benefit the species.
- The Herefordshire Ponds and Newts Project paved the way for a second LEADER+ funded project, the Ponds and Newts Restoration and Celebration Project, which resulted in the restoration of five ponds surveyed and selected with community support from the first project.
- The project identified various natural ponds of glacial origins with the northeast of the county. There is a need to gather further data on these valuable sites to record their extent and distribution in line with biodiversity objectives.
- The Project has gathered the county's most detailed pond database. The gathering of aquatic plant and invertebrate records was beyond the remit of the Project. The new Pond Habitat Action Plan grades ponds according to the numbers and presence of such rare or notable species present. There is also an opportunity to enter all the pond data and photographic records in an electronic digital format using GIS. HART is looking at ways to resource this work.
- Other priorities for future initiatives includes the monitoring of great crested ponds identified through the project,

2. INTRODUCTION

2.1 Project Evolution and Description

In August 2003 the Herefordshire Amphibian and Reptile Team (HART), launched Herefordshire Ponds and Newts Project (HPNP) - a major new biological recording initiative. It is appropriate to note how it all started.

Formed in early 2000, HART is a voluntary special interest organisation. It is a relatively small group, but enthusiastic and growing with over 60 members (January 2007). HART is the Biodiversity Action Plan lead-partner for the great crested newt and the adders. The HART management committee has experts in amphibian and reptile conservation and freshwater ecology.

In autumn 2002 HART contacted the Environmental Ambition Group of the Herefordshire Partnership regarding sourcing funding for amphibian surveys within the county. At the time we were thinking relatively small-scale; perhaps £1 2000. We then attended the Herefordshire Funding Fair and met with personnel from the Herefordshire Rivers LEADER+ Programme and found that this EU funded programme best matched our plans for a pond and amphibian project. We set about developing a brief which was tailored to the LEADER+ Programme criteria. The project had to be innovative and fulfill biodiversity objectives. The great crested newt was the key pond biodiversity species and the project was drafted to record the species and assess general pond condition within the LEADER+ Rivers area.

Confirmation that our bid had been successful was received in May 2003. In August 2003 Will Watson was appointed Project Consultant on a contractual part-time basis, being directly responsible to the Steering Group on behalf of HART. My role as Project Consultant was to coordinate the Herefordshire Ponds and Newts (HPN) Project for its duration (2003 – 2005) and be responsible for implementing publicity and engaging the public in volunteering roles. The aim was to survey 250 (or more) ponds for amphibians within the Herefordshire Rivers area, and in the process, assess general biological quality of ponds with a view to publication of an amphibian atlas.

The Project was managed by Richard King on behalf of the Steering Group who met quarterly to review progress of the project and monitor finance with the Project Manager. Members of the Steering Group included HART officers with additional co-opted members from the Herefordshire Nature Trust, Herefordshire Council and the Biodiversity Partnership.

A Project extension was secured in January 2005 extending its length from November 2005 to end of June 2006 and supplying funding for a new post of Survey Team Coordinator. The role of the Survey Team Coordinator was to manage and allocate volunteers to survey ponds according to the guidelines set by HART and the Consultant and to keep track of progress of the volunteers and the survey data using a computer database. The total level of funding for this project over the 3 year period was £82 000, including in-kind and volunteer time donated. Additional funding has been received from the Royal Society for Nature Conservation New Opportunities Fund – SEED, the Environment Agency Wales and the English Nature – Aggregates Levy Sustainability Fund through the Herefordshire Biodiversity Partnership.

The Project has been overseen by the Herefordshire Rivers LEADER+ Programme who administers the finances and offer support. What has been unique about the Project is that it has been run by a genuine grass roots organisation - not a local authority, not even a charity, but a specialist interest group. We are unaware of any other herpetological group who has run such a large scale project. Special credit must go to Richard King, Chairman of HART for masterminding the project bid.

2.2 The Herefordshire Rivers LEADER+ area

The project area is 880 square kilometres, which is 41% of the county, and includes 97 parishes which adjoin the Rivers Wye, Lugg, Arrow and Frome and include part of their catchments (see Figure 1). To put this in comparison with other parts of the UK the area of the county as a whole is 2156 square kilometres which is 0.97% of the land area of Great Britain. Herefordshire is recognised as being one of the most rural counties in England supporting almost everything we associate with the traditional English countryside; from woodlands, orchards and clear running rivers, ancient stretches of countryside with tall hedges, valleys and vistas of rising hills. The landscape of the area is predominantly lowland punctuated by plateaus and groups of isolated flat-topped hills which have been shaped by the four rivers (see Plate 1). It is estimated that there are 1900 ponds within the area at an average density of 2.16 ponds per square kilometre (Watson, W. 2002 and Lovelace, D 2008). The geology of the area is Old Red Sandstone of the Lower Devonian. The plateaus are made of harder rock with a greater proportion of sandstone. The geology of the lowlands has more clay and as a consequence there are more ponds on this substrate.



Plate 1: Flooded Letton lakes in the Wye Valley showing a series of natural ponds

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2.3 The HPN Project's aims and targets

The main aims of the project, as defined in the project's application form were to:

- determine the population size, status and distribution of the great crested newt within the Herefordshire Rivers area
- ascertain the general biological condition of ponds
- create a county pond data-base and atlas
- raise community awareness of the wildlife and heritage value of Herefordshire's ponds
- encourage the proper care and maintenance of ponds

2.3.1 The targets which related to the project's development in the original brief:

- identifying interested residents through circulating consultation material to local community groups, parish councils and voluntary organisations; in addition to seeking feedback from people via a variety of sources: newsletters, open days, literature, articles in newspapers and other organisations' newsletters
- facilitating training days for those directly involved in surveying, conservation management, with the view to help certain individuals to gain a license in surveying and handling great crested newts and other amphibians
- developing a Pond Warden network in liaison with Parish Councils (in a similar way as tree wardens are operated) to champion and promote conservation in their own specific area.
- developing a support network with a helpline, website, quarterly newsletter and conference for all participants to share ideas, experiences, and keep everyone informed of latest issues and progress with the project

2.3.2 The practical targets relating to pond and amphibian surveys:

- developing a set of criteria as a basis for the assessment of biodiversity potential; so called Best Ponds Criteria
- field training of volunteers from the community in species identification and survey methods as part of their certification to broaden their skills and the skills available to the project in supporting the already qualified project leaders
- carrying out initial surveys of at least 250 ponds to assess their biodiversity potential, their origin, and their past and present use
- carrying out detailed surveys to determine the status and distribution of the great crested newt, as well as the other amphibians
- during the surveys, recording the presence of any species covered by Species Action Plans in the LBAP
- recording all data on the databases of the Herefordshire Biological Records Centre (HBRC)
- monitoring over a 3 year period those ponds supporting good populations of great crested newts
- identifying up to 50 of the finest ponds for conservation management based on the assessment criteria
- record other BAP and/or specially protected species which inhabit or regularly use Herefordshire ponds such as medicinal leech, water vole, otter, kingfisher and several species of bat

We were also asked by Herefordshire Rivers LEADER+ Programme to provide a list of performance indicators. Important performance indicators included hosting 25 environmental events to recruit volunteers/gain community interest; the provision of 18 pond training days for the public with the aim of training 180 people; producing a 'Best Ponds Criteria'; and surveying the best 50 ponds again in detail. A full list of the performance indicators is provided in Appendix 1.

2.3.3 Targets relating to reporting:

- documentation in conjunction with Herefordshire Biological Records Centre, of all data collected into an appropriate form for use by the county, as a basis for best practice conservation management
- producing detailed descriptions of the botanical interest of each pond; species lists; and information to enable designation of pond sites as Special Wildlife Sites, Site of Special Scientific Interest and/or Special Areas of Conservation.
- production of a great crested newt atlas for Herefordshire
- identifying ponds of historical interest, and producing statistical analyses of the pond data for each parish as required
- recommendation of specific conservation plans for the best 50 ponds enabling re-colonisation by the great crested newt and other pond biota, and halting the biological deterioration of ponds
- production of pond heritage and wildlife information display boards for the most appropriate ponds (with good public access)
- production of a costed proposal for implementing pond conservation management in the county based on agreed assessment criteria

These can be best summarized as:

- a. Training events and people trained
- b. Publicity events attended and interest shown
- c. Ponds surveyed
- d. Atlas produced
- e. Best Pond criteria
- f. Pond assessment methodology and assessment of Herefordshire's ponds

HART and the Steering group also considered the option of surveying all ponds for aquatic plants and macro-invertebrates in addition to recording the physical condition of the pond and amphibian populations. However, it was recognised that this was beyond the scope of a majority of volunteers to identify and record such main groups. The HPN Project will include such data returned from skilled individuals under additional information within the standard pond questionnaire.

Some targets drawn up in the original application brief were either dropped or modified at the request of the Steering Committee and after seeking approval from Herefordshire Rivers LEADER+. These are as follows: identifying up to 50 of the finest ponds for conservation management based on the assessment criteria and the production of management plans was dropped as this was too ambitious and overlapped with the second phase of the project; the Pond Warden output was modified to reduce the duties of the position and to distinguish it from other fully-funded pond projects the role was re-defined as Pond Steward; the report on the 50 best ponds was changed to the final report on the HPN Project. The atlas originally defined as a great crested newt atlas is redefined as the Amphibian and Reptile Atlas for Herefordshire.

3. METHODS & PROCEDURES

3.1 Survey design

The Project has operated differently from other previous amphibian surveys (Baker et.al) in that it is community-based with farmers and other landowners having come forward with ponds to be visited, thus giving no opportunity to randomly record ponds according to standard methods. The Project was also confined to a rather narrow geographic area covering only a small percentage of the land area; just under half of 1% of the total land area of the United Kingdom. However, this has allowed for a relatively high coverage with around 10% of ponds within the area being surveyed; We accepted all pond sites, for example there was no restriction on the size of ponds surveyed so it included ponds, pools, farm reservoirs and lakes. To further reduce the natural tendency to survey ponds which just look good for amphibians we consciously asked landowners to allow us to survey all ponds on their landholding. We had no predetermined strategy or list of favourite ponds to be surveyed. The Herefordshire public was the primary source of contact for ponds to be visited. We also had a rule that we would not survey ponds which knowingly had been previously surveyed so all records, amphibian or otherwise generated by the Project are new to the county. We also deliberately publicized the Project across the entire area to get a wide coverage and tried to spread the publicity evenly.

It was also recognized that a basic presence and absence survey may tell that the species is widespread but would tell us very little about the health of individual populations and their local conservation status. What was needed was more detailed field evidence. A pond survey form was expressly devised to assess the condition of each pond then this information was used to grade ponds based on habitat characteristics that great crested newts are known to favour. The survey form was influenced by Swan. & Oldham, *National Amphibian Survey Final Report*.

3.2 Publicity

The first task of the project was to produce a leaflet publishing its work. The leaflet outlined the aims and objectives of the project with tick boxes for people to express their level of interest. We specifically targeted pond owners. In the leaflet we asked if they wanted a free survey and training. In addition a letter was sent out to all 97 parish councils in the area informing them of the project and asking for point of contact. Four laminated A1 display boards and giant newt banner were also produced which were taken to a range of publicity events.

In March 2004, HART received funding from LEADER+ Programme to develop and designs its website: www.herefordhart.org. It is now maintained by HART and contains information about Herefordshire's amphibians and reptiles with a section on the project. The project's training events were also advertised through the website.

A project launch was held in the village of Eardisley in March 2004 to which all parish council and local interest groups were invited. A slide show about the Project and Herefordshire's ponds was presented. The attendance details were taken and from this source as well pond owners were contacted.. All the countryside and wildlife organisations (such as the National Trust, the Woodland Trust, the Forestry Commission) with land or land management responsibilities in the county were contacted by phone to ascertain if they wanted 'free' surveys and whether they would like to send people on training courses. Herefordshire FWAG also passed on details of farmers who wanted pond surveys. In 2005 we continued the publicity by writing to the major landowners within the county. Through contacts with Herefordshire FWAG the project was also approached by the Duchy of Cornwall to survey all ponds on their

Herefordshire estate within the project area. In 2005 10 wildlife and countryside organisations were contacted and offered an article for inclusion in their publications. The Herefordshire Environmental Education Schools Forum (HEEF Group) was attended with a view to publicizing the project within schools.

In total 28 publicity events were attended and these are listed in the table below. The events included high profile attractions such as the Three Counties Show, the Herefordshire Show as well as smaller events such as RSPB Open day at Walford near Ross. At each venue we presented display boards, leaflets and most importantly ourselves to publicise the work of the Project. Leaflets were distributed to libraries, the Herefordshire Nature Trust office at Lower House Farm, and at exhibitions such as the Caring for God's Acre display at All Saints Church in Hereford.

Date	Location	Support Volunteers present
19/1/04	Eardisley Parish Council	Will Watson
26/3/04	Project Launch at Eardisley	Nigel Hand, Richard King, Stuart & Valerie Webb
16/4/04	Walford Fun day	Laura Preece
16/5/04	NT Wild Day at Weir Garden	Hellie Barber, Hayley Jack
9/6/04	Herefordshire Environment Day	Hellie Barber, Margaret Wrenn, David and Fidelity Gill, Richard King
12/13 June 2004	NT Wild Days at Croft Castle	Nigel and Kate Hand, Hellie Barber, George Cebo, Hayley Jack, Claire Shipley
18-20 June 2004	Three Counties Show	Hilary Smith, Martin Hales, Richard King
11/07/04	Bodenham Garden Party	Richard and Phyl King
25/11/04	Herefordshire Environmental Education Forum – presentation and display	Will Watson

Date	Location	Support Volunteers present
14 to 25 Feb 2005	Caring for God's acre Exhibition at All Saint's Church Hereford	Helly Barber, Nigel Hand, Richard King Margaret Wrenn
4/5 Feb 2005	Froglife Conference – presentation and display	Will Watson, Richard King
27/3/05	Community Commons meeting (HNT organised)	Will Watson, Nigel Hand
Feb 2005	Risbury Parish	Will Watson
26 April to 5 May 2005	Caring for god's Acre Exhibition at Ross-on- Wye library	Richard King Phyl King
4 th June 2005	CPRE AGM at Hergest Croft	Richard King
17-19 June 2005	Three Counties Show	Hilary Smith, Martin Hales, Richard King, Phyl King
28 June 2005	Official Opening of The Sturts	Will Watson, Margaret Wrenn Ian Wrenn
7 August 2005	Herefordshire Country Fair	Will Watson, Nigel Hand, Richard King, Phyl King, Jules Agate, Kate Hand
November 2004	HGBI Regional Conference	Will Watson Nigel Hand
29 Nov 2004	Parish Plans Awareness Day	Will Watson
29 Jan 2005	HBRC Recorders' Day	Will Watson, Nigel Hand, Richard King
20 April 2005	Hampton Dene Primary School	Nigel Hand
September 2005	HGBI Regional Conference	Will Watson Nigel Hand
17 November 2005	LEADER+ Annual Conference	Will Watson, Angela Charlton, Richard King
4 February 2006.	HBRC Recorders' Day	Angela Charlton
4-5 February 2006	Herp Workers Annual Conference	Will Watson, Richard King, Nigel Hand, Phyl King, Val Bradley
16 June 2006	Hfds LBAP Launch at Woolhope	Will Watson, Lydia Robbins, Nigel Hand
17-18 June 2006	Three Counties Show	Hilary Smith, Martin Hales
Total: 28		

3.3 Training

A total of 12 training events were held in four different venues across the area from Humber Marsh and Broadfield Court in the north to Little Dewchurch and Hindlip College in the south. Training was delivered by the Project Consultant and Dr. John Baker professional herpetologist (see Plate 2), or Dorothy Wright of the Herpetological Conservation Trust. Two training courses were held in July to enable participants to identify newt tadpoles.



Plates 2 & 3 Dr. John Baker at Little Dewchurch Village Hall and Will Watson training at Holme Lacy College

Training Course Details:

Training courses were open to all but participants were informed about commitments in advance, for example, participants were asked to survey a minimum of 3 ponds in groups of 2 people on behalf of the project.

Training courses commenced at around midday, running until the evening and culminating in a night-time great crested newt torching session. All the courses followed a standard format and were free to the attendees.

Date	Leader(s)	Venue	Field location	Trainees Attending
27 th March 2004	Dr. John Baker/ Will Watson	Little Dewchurch village Hall	Holme Lacy College/ Woodlea ponds	21
24 th April 2004	Dr. John Baker/ Will Watson	Little Dewchurch village Hall	Holme Lacy College/ Woodlea ponds	11
15 th May 2004	Will Watson	Eardisley Village Hall	New House Farm	7
13 th June 2004	Will Watson	Croft Castle	Croft castle	3

Date	Leader(s)	Venue	Field location	Trainees Attending
22 nd July 2004	Will Watson	Pembridge Village Hall	The Leen/ Westonbury	7
19 th March 2005	Dr. John Baker/Will Watson	Little Dewchurch village Hall	Holme Lacy College/ Woodlea ponds	12
21 st April 2005	Will Watson	Humber Marsh	Humber Marsh/ Broadfield Court	10
23 rd April 2005	Dorothy Wright/Will Watson	Pembridge Village Hall	The Leen/ Westonbury	8
7 th May 2005	Dorothy Wright/Will Watson	Moccas Village Hall	Moccas Park NNR	7
16 th July 2005	Will Watson	Little Dewchurch village Hall	Woodlea ponds	13
1 st April 2006	Dorothy Wright/Will Watson	Little Dewchurch village Hall	Holme Lacy College/ Woodlea ponds	13
10 th April 2006	Will Watson	Humber Marsh	Humber Marsh/ Broadfield Court	12
Total:				124

The aims of the training courses were to:

- enable volunteers to identify all three species of newt with special reference to great crested newt
- ensure that they were conversant with safety procedures and were aware of health risks associated with pond surveying and ways that risks could be minimized
- explain the scope of the survey, set procedures to enable each surveyor to make informed choice about the type of methods required
- facilitate proficiency in three survey techniques; netting, torching and egg-searching
- allow volunteers to assess biological condition of each pond visited
- train each volunteer to a sufficient standard to merit Accredited Agent status.

Courses started with an introductory talk about the project and ‘the status of great crested newts in Herefordshire’, after which Survey Volunteer Packs were distributed.. This was followed by a lesson in pond survey techniques and how to assess pond condition. Volunteers were shown how to fill in pond and amphibian survey forms, draw a sketch plan, take OS map readings etc.

A PowerPoint display on the ‘developmental stages of the great crested newt: ponds and preferences’ also incorporated the law; capture methods & licensing; how to record results; health & safety; insurance; notes for surveyors; and site access. Each volunteer was shown how to fill in a Site-specific Risk Assessment form. Insurance cover was provided by the BTCV.

The aim was to have volunteers on site by mid afternoon, where all three species of newt were known to occur in order to practice netting, discuss safety aspects of surveying and to familiarize volunteers with completing survey forms in the field (see Plate 3).

In the evening we reviewed survey results and summed up: how to present your amphibian results and where to send them; further reading; feedback. Planning future outings with interested individuals; such as a torchlight survey of a great crested newt pond as part of the project survey and shadowing work during the weekend.

Later on the volunteers were taken to a site known to host all three species of newt where they were able to carry out a torchlight survey effectively. Finally volunteers were presented with their accredited agent licence and a copy of the Project Consultant’s great crested newt licence. Course evaluation forms were also completed and returned.

Four extra training courses were held to cover different aspects of pond conservation, namely; two water beetle training courses (see table below) lead by Professor Garth Foster of the Balfour-Browne Club; a pond management course held in conjunction with Dr. Jess Allen of the Herefordshire Rivers Lifescapes Project; and a pond training course for teachers held at the Madley Environmental Centre. People trained on these additional courses are included in the final target of trained personnel by Herefordshire Ponds and Newts Project.

Date	Leader	Venue & Course	Field locations
7 th May 2004	Will Watson	Byton Village Hall: Pond restoration in collaboration with the Lifescapes Project	Byton Church pond
2 nd October 2004	Prof. Garth Foster	Bredwardine Village Hall: Water beetle course	Herefordshire Nature Trust’s Waterloo reserve
28 th April 2004	Will Watson	Madley Environmental Centre, BT Madley Earth Satellite Centre: School's pond management course	Madley Environmental Centre
22 nd May 2005	Prof. Garth Foster	Hampton Court, Hope-under-Dinmore: water beetle course	Hampton Court Lake and the Humber Brook

3.4 Survey Methods and Protocols

The Volunteer Coordinator and the Project Consultant gave volunteers details of pond sites to visit providing names, addresses, telephone numbers and where possible information about the ponds on the landholding. The aim was to match volunteers either with ponds relatively close to where they lived or personal preferences. In most circumstances the volunteers were asked to contact the pond owners and if possible meet them in person. This enabled useful feedback on the ponds and the owners' plans for the ponds and allowed volunteers to get the all important signature from the landowner to permit records to be placed on the HBRC database.

Volunteers who were either less proficient or confident about field surveys were either matched with a more experienced volunteer or were supported typically in the first instant by the Project Consultant.

On arrival at a pond site volunteers were instructed to fill in a Site-specific Risk Assessment form, allowing them to evaluate the hazards at each pond and to determine whether to proceed with the survey, and if so, what steps to take in order to minimize risks.

3.4.1 Amphibian Survey

This was devised to be a presence or absence survey. Volunteers were first encouraged to conduct an egg-search for great crested newts and then carry out dip-net sampling in weedy areas of the pond approximately every 2 metres of shoreline in accordance with the *Great Crested Newt Pilot Monitoring Project* (Froglife, Baker, J. 2003). The numbers of great crested newts and other amphibian species were recorded as well as time and duration of surveying. The amphibian survey form was a modified version of that in the *Great Crested Newt Conservation Handbook* (Froglife, 2001). However in addition the HPN Project asked volunteers to draw a sketch plan of the pond as grid references and pond descriptions alone are often insufficient when it comes to re-identifying a pond at a future date. For example, volunteers were asked to mark the position of major features such as trees, inflows, outflows and dominant plant communities.

The majority of surveys were carried out between late March and early June however, proficient volunteers were encouraged to survey ponds until the beginning of September, recording the presence or absence of great crested newt tadpoles.

Torchlight surveys were carried out where there were sufficient clear stretches of open water with good water clarity, in combination with sites that were relatively safe to visit. Volunteers were instructed to go once around the edge of the pond so as to reduce the risk of re-counting the same individual newts.

3.4.2 Pond Survey

The Pond Survey form incorporated a series of tick boxes usually with five habitat options, which made for easier statistical analysis. The surveyor could select one or more options of various habitat choices per column. Half a sheet of A4 space was also provided for comments. For example, surveyors were asked to record the owners' habitat management preferences for the pond; any information which might relate to the pond's history or past use; general comments about problems; notable species and species abundance. The space could also be used to list aquatic fauna and flora plus other pond species.

At the beginning of 2006 a county-based aquatic plant species list, an aquatic macro-invertebrate species list and a water beetle list were produced by HART. These were drawn up listing species recorded over the two previous years of the survey and used tick boxes for convenience. There was also additional space for extra species to be added. The new forms made it easier for both recorders in the field and for volunteers interpreting and inputting the data at HBRC.

People were encouraged to take photographs of ponds as well, although photography wasn't part of the standard recording protocol.

3.5 Equipment

Each of the volunteers was provided with three sets of each survey form: Site-specific Risk Assessment; Amphibian Recording form; and Pond Condition Form. On request, volunteers were provided with dip nets of a 250 mm frame width, 1 metre handle, 300 mm deep bag and 2 mm mesh size. They were also provided on request with a Clulite Classic torch with a Krypton 500 000 candle-power bulb. The Project also had and loaned on request waders; safety jackets; a set of Explorer 25 000 scale maps of the entire region; weather writer clipboards; and an eTrex GPS personal navigator manufactured by Garmin.

3.6 Reporting

On completion of a pond survey, volunteers sent forms initially to the Project Consultant and later on in the project, to the Conservation Manager at Herefordshire Nature Trust. In either case forms were copied and passed on to Herefordshire Biological Records Centre where species data could then be entered onto the national Recorder database. Data was also entered onto an Access database specially designed and maintained by HART members. HRBC has played a vital role in producing the subsequent Amphibian Distribution Maps. Original copies of survey forms were sent back to and stored at the Project Consultant's office.

4. RESULTS

4.1 Volunteer Involvement

The total number of attendees on the Pond and Amphibian Training Courses was 124 of which all but a few received accredited agent status. A further 41 people attended the additional training courses. The Project has trained a total of 165 people, attending a total of 16 training courses.

Fifty eight of the volunteers were professionally engaged in conservation work at some level or in full-time education. 66 were 'ordinary' members of the public and had no previous professional involvement in conservation, although many were members of conservation organisations. Seventy six volunteers carried out one survey or more. This represents half of the trained volunteers. However, seven of the volunteers which carried out 85% of all surveys and conversely 25 of the volunteers carried out just one survey. The pond surveyors attending training courses were based throughout the Herefordshire with no significant bias towards the Herefordshire Rivers area. There was a very low take up from pond owners to attend training courses, with probably less than 10 people represented. Eight volunteers resided outside the county, but most of these either worked or had some contact with the county.

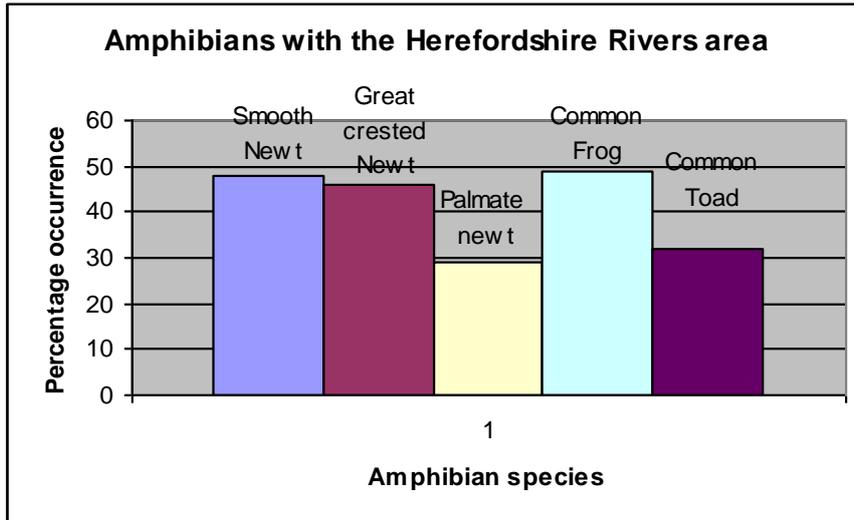
4.2 Ponds visited and benefits to people and the community

A total of 286 ponds have been surveyed with good coverage throughout the Herefordshire Rivers area. However, there is a slight bias towards the Leominster region which can be accounted for due to the fact that the Project Consultant lives in the area and has developed a better local network of local pond owners. It is difficult to put an accurate figure on the numbers of farmers and other landowners receiving pond conservation management advice but at least 52 people received some form of conservation advice receiving a copy of the Great Crested Newt Conservation Handbook and or being given practical conservation advice. The following organizations asked and received advice Natural England for the Moccas Estate ponds, the Duchy of Cornwall who received a detailed pond management written by Anna Jones with support from the Project and the National Trust who received advice on 11 ponds and Bulmers who received conservation management advice on their nature reserve at Staunton-on-Wye. We also know of five ponds which have benefited practical conservation management as a result of our efforts. A further 12 ponds have conservation works planned in 2007.

4.3 Amphibian results

The Project to date (as of the 1st November 2006) has generated 606 amphibian records. Forty six percent of all ponds visited were found to support the great crested newt (see Figure 1). 48% of ponds supported smooth newt and 29% of ponds supported palmate newt. Thirty ponds supported all three species of newt representing 10.5% of all ponds. In addition, 49% of ponds supported common frog, 32% of ponds supported common toad and two ponds were found to support the introduced marsh frog. Seventeen percent of ponds have been visited more than once. The records show that great crested newts are spread evenly throughout the area with obvious areas of deficiency. However, all 10 ponds surveyed at Harewood Park on the intensely managed Herefordshire plain were negative for the species. Equally there are no apparent localities where great crested newts are significantly more numerous.

Figure 1



4.4 Pond survey and pond habitats

Listed below (3.5) are the 10 Suitability Indices specially developed by Oldham et al., (2000) for assessing great crested newt pond condition. Stephen West, a Masters dissertation student from Worcester University and Will Watson, HPNP Project Consultant, have processed the habitat survey information collected from 260 of the 286 ponds surveyed.

The data is of use at two resolutions:

- raw data on each habitat are used to assess general pond habitat characteristics, a summary of which is listed under sections 3.5
- by devising a numerical scoring system for habitat factor it has been possible to formulate a score for each of the suitability indices. Using this data we have then been able to grade the ponds into four states of condition: poor, moderate, good and excellent (see section 3.5)

4.5 Habitat Suitability Indices

4.5.1 Geographic Location

According to the indices Herefordshire is an 'optimal' location for great crested newt, the other listed categories being 'marginal' and 'unsuitable'. This is based upon existing maps of newt distribution (Arnold, 1995). Our results also indicate a high rate of occurrence for the species.

4.5.2 Pond Area

In the National Amphibian Survey (Swan & Oldham, 1993) ponds between 500 -750m² were shown to be optimal for great crested newts. Interestingly only 10% of ponds surveyed by the project were between 500 and 750 square metres. The range of pond sizes which great crested newts occurred varied considerably across the Herefordshire Rivers area. The largest pond supporting a breeding great crested newt population was Lyde Arundel irrigation reservoir at 2 hectares. There were 12 ponds which were

100 square metres or less supporting a breeding population. These include Stoke Prior and Kimbolton Primary School ponds.

3.5.3 Pond Permanence

According to Oldham et.al semi-permanent ponds are those which dry out at least once every decade. In our survey great crested newts were found to be present in roughly equal numbers in both permanent and semi-permanent ponds. Inevitably many of semi-permanent ponds have fallen into the permanent category because their proper status has not been determined

4.5.4 Water Quality

Water quality was assessed by Stephen West by analyzing the biological data in line with the standard HSI guidance. However; the information is in a subjective format. Observable events such as fish deaths, physical debris use of herbicide application close by were used. Two categories are provided bad or poor represented by 33% of ponds and moderate or good represented by 67% of ponds. There are four biological grades. 60% of ponds surveyed had good supporting biological information. Only 10% were excellent whilst the vast majority were good to moderate.

4.5.5 Pond Shading

Ponds which are heavily shaded, greater than 70% shade, are not usually suitable great crested newt breeding sites. Over-shading generally was not a significant problem with less than 5% of ponds falling into this category. Although heavy shade wasn't an issue it should be stressed that ponds with 50% shade or more can rapidly deteriorate when the pond switches from an aerobic state into an anaerobic condition. However, the majority of ponds we surveyed had optimal or good shade. Statistically the sample size of shady ponds with great crested newts is too small to draw a conclusion from our samples.

4.5.6 Number of Waterfowl

Waterfowl in naturally balanced populations have little adverse effect upon newt numbers. However, in ponds where birds receive supplementary feeding serious damage can be caused to aquatic plant communities and subsequent enrichment can further degrade pond habitat for newts. Our survey data found that 32% of ponds had some waterfowl. However, only 2% of ponds had large numbers of mallard and the like where serious damage to vegetation structure in the pond was inflicted as a consequence.

4.5.7 Occurrence of fish

Fish, particularly stickleback species are known to be significant predators of aquatic life. Great crested newts; newt tadpoles and eggs are especially vulnerable to predation. Only 6% of ponds were found to support fish of some species or other. One pond was found to support carp and tench as well as great crested newts. The overall occurrence of fish in ponds has been under-estimated as surveyors were not fully equipped to survey for fish. As might be expected fish were generally associated with larger pools.

4.5.8 Pond density

The average density of ponds within the project area was estimated to be 1.8 km² by counting all ponds shown on the OS Explorer maps. However, from experience between 10 and 15% of ponds in Herefordshire do not feature on Ordnance Survey maps. The average pond density within a 1 kilometre

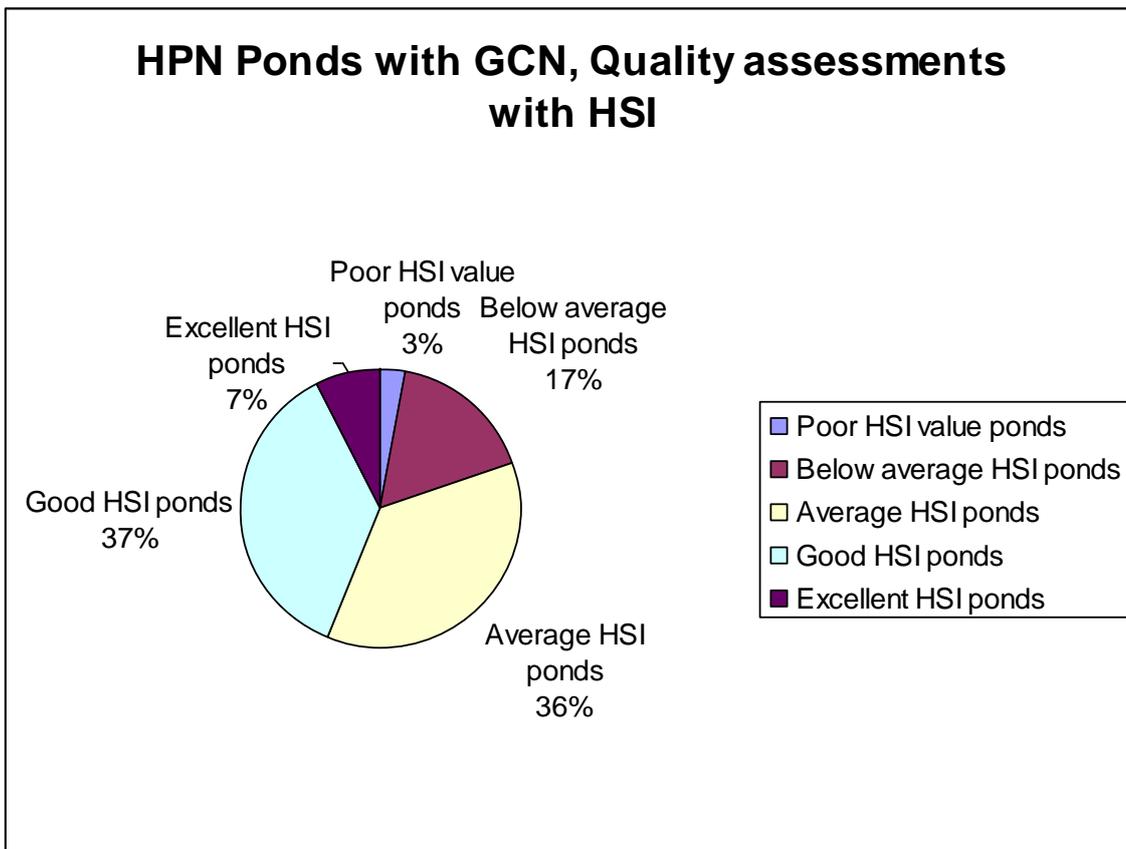
radius of the 160 ponds surveyed estimated from the OS maps but including ponds not marked on the OS map which were surveyed 2.37. This well is above the minimum threshold of about 0.7/km for great crested newt occurrence. However, the optimum pond density for great crested newt is 4 ponds per square kilometer. Only about 16% of ponds are located within 1 Km squares with 4 or more ponds. Conversely about 20% ponds in the LEADER area had no other ponds in the square. This indicates that in some localities it may be difficult for crested newts to find and colonise new pond sites and that such populations may be prone to genetic isolation.

4.5.9 Proportion of ‘newt friendly habitat’

Just over 50% of great crested newt ponds were found to have average surrounding terrestrial habitat. 15% of ponds representing 41 of the ponds surveyed were found to support poor terrestrial habitat. All those ponds with good terrestrial habitat had great crested newts, but only 5% of all ponds surveyed had good terrestrial habitat. Of those with poor terrestrial habitat only 14% supported great crested newts supporting the hypothesis that good terrestrial habitat is a vital factor in accommodating healthy populations of newts.

4.5.10 Macrophyte Content

More than half the ponds had optimal macrophyte content. However, about 20% of ponds had no or little aquatic vegetation. Macrophyte content is linked to shading and again, this illustrates that lack of pond management is cause for concern. This issue is discussed later.



4.6 General Pond Condition

Overall a third of all ponds with great crested newts were in good condition and a third of ponds were in average condition. Significantly 20% of ponds were found to be poor or below average condition as opposed to just 7% of ponds with great crested newts being in excellent condition. This indicates that the great crested newt populations within the majority of ponds are disadvantaged because of sub-optimal habitat condition. There is therefore good evidence that habitat management of great crested newt ponds involving such practices as shade reduction, de-silting and improving water quality will benefit the species.



Plate 4: example of a HPN pond in good condition



Plate 5: example of pond in poor condition

4.7 Other biological results

The project has gathered 1501 aquatic plant records and recorded a total of 137 species. 1218 aquatic invertebrate records have also been generated with a total of 163 species. This includes 583 water beetle records with 94 species recorded within the Herefordshire Rivers. Most significant in this respect was the discovery of the specially protected fairy shrimp on Hergest Ridge near Kington and specially protected medicinal leech and Red Data Book 2 (RDB 2) at the Bulmer's nature reserve, Staunton-on-Wye. There are no recent records for the county (the most recent record being 1935) for the fairy shrimp whilst the medicinal leech is only known from one other site within Herefordshire and nationally, only occurs in 20 locations in the United Kingdom. During the course of the survey seven RDB species were recorded. They are the two previously mentioned species, four water beetles: *Dryops auriculatus*, *Enchrus nigrinus*, *Helochares obscurus* and *Hydrochus elongatus* and the mud snail *Lymnaea glabra* which was found on the Sturts, nature reserve. Fourteen notable species of water beetle were also recorded. Approximately $\frac{2}{3}$ of the water beetle records were determined by Professor Garth Foster, Secretary of the Balfour-Browne Club. We also looked for other species found in and around ponds. Other successes include the discovery of the rare and specially protected water vole at Madley and Linton. Kingfisher was recorded at Stoke Prior and Linton.



Plate 6 & 7 Medicinal Leech and cocoon found at Lower House Orchard, Staunton-on-Wye

4.8 The Atlas

A 72 page reptile and amphibian atlas of Herefordshire has been written by Will Watson, Project Consultant, Nigel Hand, HART Reptile recorder and Phyl King, HART amateur naturalist and Newsletter editor. HART has included Herefordshire Reptiles to widen the appeal of the atlas. The atlas is published and distributed by the HBRC and can be bought from the Herefordshire Nature Trust office and local bookshops. It covers sections on all 5 amphibian species recorded in Herefordshire plus reference to non-native species and has a chapter on Herefordshire's ponds. The Project has been responsible for generating about 23% of all the records in the atlas. Without the Project's contribution HART couldn't have produced an atlas. We also have to thank Herefordshire Rivers LEADER+ Programme for their financial contribution which enabled us to produce the atlas. Inevitably, some of the results are skewed towards the project area.



Plate 8: The launch of the Atlas in the Town Hall © John Burnett

4.9 Training Courses

People attending training courses had an opportunity to offer feedback to the training team using an evaluation sheet. This had six questions with four possible answers; poor OK, good and excellent. The questions related to:

- The Pre course letter
- Handouts
- Training venue
- Trainers
- Enjoyment of the course
- Meeting expectations

The completed sheets were scored (poor ==1, OK = 2, good = 3 and excellent = 4) giving a maximum of 24. These results relate to courses in 2004 and 2005.

Number of trainees 2004/5	99
Number of evaluation forms completed	61
Number completing all 6 questions	54
Highest individual score	24
Lowest score (6 questions)	17
Average score	21.5

The majority of forms were dated so differences relating to time, trainer and the venues could be assessed. It was found that there was no significant difference between trainers or venues. The highest and lowest scores per course were achieved by the last two courses in 2005.

Most of the questions were scored as 'good' or 'excellent'. The pre course letter registered the most 'OK' replies with 8.

The trainees were also asked to make comments to improve the course for future training events. Thirty two trainees made comments. On the first two courses several trainees suggested name badges and introducing course members. This suggestion was acted upon.

On the critical side matters which were raised several times:

- Extra guidance needed with survey form completion
- More time needed for practical surveying
- Need for better explanation of what was required by the trainee after the course
- Irritation with course leaders who read from their slides

Many of the trainees described the training as "brilliant course" and "fascinating and enjoyable day".

In conclusion the results are extremely positive overall and showed that the courses were all successful in achieving their objectives. The critical points tended to relate to amount of time spent on different sections of the course. In reality it would not have been practical to extend training course spending additional time surveying in the field as each training course lasted on average 9 hours; which is quite sufficient for community volunteers. We did offer and deliver back up in the field after the training courses.

4.10 The contribution of the volunteers and volunteer time

Part of the matched funding was made of time committed to the HPN Project by volunteers surveying ponds, attending events to raise the profile, and carrying out administration. Time sheets were filled in by all volunteers.

Date of Claim	Surveys	Admin: Chairman	Admin: Committee	Admin: Other	Events & training support	Totals
Oct - Dec 2003		95 hrs	159 hrs	61.5 hrs	7 hrs	322.5 hrs
Jan - June 2003		145.5 hrs	205 hrs	22.5 hrs	36 hrs	409 hrs
July - Dec 2004	168 hrs	98 hrs	76.5 hrs	71 hrs	90 hrs	503.5 hrs
Jan - June 2005	17 hrs	147 hrs	113.5 hrs	43 hrs	10.5 hrs	331 hrs
July - September 2005	169.5 hrs	93.5 hrs	64 hrs	105 hrs	70 hrs	502 hrs
Totals	354.5 hrs	579 hrs	618 hrs	303 hrs	213.5 hrs	2068 hrs
Percentage	17.1%	28%	29.9%	14.7%	10.3%	

At the end of September 2005 all matched funding for volunteers had been claimed and time sheets were then no longer completed. The project continued for another 10 months. However, over this period there has no been a let up in the commitment of the chairman and the committee. In 2006 approximately 40 surveys were carried out on a voluntary basis; higher than previous years. The Herefordshire Biological Records Centre data shows that volunteers input 256 hours imputing biological data from the surveys. It has been estimated that a further 1158 hours have been undertaken by volunteers in 2006. The hours have been estimated from attendance at six events and two training events for 2006 and a large number of unclaimed volunteer hours which have been put into the production of the atlas. The final total of volunteer hours for the 3-year duration of the project is 3250 hours.

5. CONCLUSION

5.1 The current status of the great crested newt in the Herefordshire Rivers area

The status of great crested newt within the Herefordshire Rivers is widespread with the species being found in 46% of ponds. If there 1978 ponds within the area by extrapolation we can estimate that there are 909 great crested newt ponds within 880 km² area. This is very high pond occupancy for this species and there are few other places in the country known to support so many crested newt ponds at such high densities. Nationally, this ranks Herefordshire alongside counties such as Worcestershire, Warwickshire, Cheshire and Gloucestershire, Kent, Sussex and Essex where the great crested newt can be said to be locally common in occurrence as a consequence of other detailed surveys.

The distribution of great crested newt within the area is not evenly spread. There are areas where the species is deficient in the county such as Harewood Parish where there are both low pond densities and negative occurrence of great crested newt. This may be due to a high percentage of intensively managed agricultural land. Conversely there are locations where they occur in the majority of ponds where there are clusters of ponds such as at Lyde Arundel and the adjacent Kenchester Water Gardens in Pipe and Lyde and the group of water bodies at Humber Marsh, Stoke Prior. Yarkhill Moat was shown to be very successful for great crested newts breeding (see Plate 10)

5.2 Condition assessment of Herefordshire's Ponds

However, despite the great crested newts widespread occurrence there is concern over the condition of many ponds. With well over half of the ponds in sub-optimal condition, population size is likely to be low. Small populations are particularly vulnerable to habitat change and genetic isolation and the species will be more vulnerable to local extinctions where there are fewer ponds and where habitats are sub-optimal.

As much as 56% of ponds are of poor or average quality according to the habitat suitability indices. The following negative factors have been identified by the survey; heavy shading, silting of ponds, abundance of choking aquatic vegetation and/or lack aquatic vegetation necessary for egg-laying. Where the habitat is suboptimal and when population sizes are small it only takes a relatively minor change to the habitat to result in ponds becoming 'sink ponds', where great crested newts will inhabit but not successfully breed. If such negative conditions persist local extinction of the population will occur (see Plate 9). The trend towards earlier desiccation of ponds can also have a major influence on vulnerable populations and requires monitoring.

Where there are ponds within 500 metres of each other adults do move between ponds and can therefore successfully breed in more suitable ponds. Isolated populations, greater than 500 metres from other existing populations, are at greater risk. In such circumstances negative factors can have a catastrophic effect. Small ponds with isolated populations must be seen as particularly susceptible to change. So far out of the total of 125 ponds with great crested newts we have identified 12 isolated populations which may be prone to local extinction. However, we do not have sufficient information on the population sizes. This is probably higher than might be expected in other regions because Herefordshire's ponds are at quite low densities.



Plate 9; Bolstone pond in sub-optimal condition for great crested newts and Yarkhill Moat an excellent breeding site



5.3 The status of other amphibian species

There are large numbers of ponds in Herefordshire supporting all three species of newts. Around 11% of ponds which received a full survey support all three species. Nationally, this may be significant because there are few places in the country which are known to support all three species. Geology is thought to be an important factor, with palmate newts preferring more acidic soils, whilst the smooth and crested newts prefer mildly basic or neutral conditions. Somehow the Herefordshire Devonian Sandstone provides the right conditions for all three species. It was very rare to find all five species breeding in one pond; we know of one at Fownhope. However, the presence of five species of amphibians within a location containing a cluster of ponds occurs in about 5% of Herefordshire's ponds.

5.4 Project targets achieved and shortfalls

All results for the pond assessments and surveys will be passed to the Herefordshire Biological Records Centre for general conservation use.

The Project aimed to estimate great crested newt population size. Upon reflection, this was over-ambitious. Assessment of population size usually means monitoring of sites over a long time period. It was always our intention to monitor some sites either directly through the Project or through other HART initiatives. In reality, only four sites received follow up surveys to record adult great crested newts. However, the pond survey has enabled us to come up with a list of sites, which because of their habitat structures, are likely to support good or excellent populations of great crested newt.

All licensed personnel were told to submit a licence return form and provide evidence of reporting of biological records. Trained licensees were encouraged to carry out voluntary survey work and generally support recording initiatives within the county.

Under the targets we mentioned that the Project would enable others to gain full great crested newt licences. During the course of the Project four people who attended our training courses have obtained great crested newt licenses whilst a similar number have gained experienced and may apply over the next 12 months for their own great crested newt licences.

Another aim of the Project was to produce conservation management plans for 50 of the best ponds. This target is very much dependent upon the willingness of the farmer or landowner to undertake pond management work. Only 15 pond owners requested pond management advice which was far lower than had been anticipated. It appears that many of Herefordshire's pond owners are either non-committal about the condition of their ponds or are not aware that the ponds are in sub-optimal condition. Clearly in the future, we may need to be more pro-active when it comes to offering pond management advice. Overall it was again an ambitious target but we can report that 8 pond owners received brief management advice, a further 12 received information either in the form of the great crested newt handbook and an undisclosed number received verbal advice. Pond owners intending on initiating pond management work had to demonstrate that the restoration scheme had the backing of the local community.

There was also a target to produce a 'best ponds criteria' which provides advice in selecting ponds requiring management. A copy of these targets is listed in Appendix.1.

Detailed surveys, incorporating aquatic invertebrate and plant surveys, were carried out on ponds which were in a bad state or require urgent management. This information was used to help prepare the pond management briefs.

An additional trigger for carrying out a detailed survey was the potential nature conservation value of the pond. Where ever possible ponds which were found to support large numbers of great crested newt adults and/or tadpoles were surveyed in detail.

One of our targets was to produce a Pond Warden Network in liaison with Parish Councils. Again, on reflection this was a very ambitious target. The Pond Warden Project which operated in Cheshire in the mid 1990's had a full-time support officer as well as backing from the local authority. We therefore, with the backing of the LEADER+ Programme, scaled down this target and produced a Pond Support

Team leaflet to promote pond stewards (see Appendix 2). HART through the development of local pond stewards still plans to monitor great crested newt ponds with a view to identifying potential Sites of Special Scientific Interest and Special Wildlife Sites. This is a biodiversity target for both the LBAP and the National Species Action Plan.

HART has now developed this concept further and the idea now is to enable our willing volunteers to continue their good work by becoming 'friends of Madley Moat' and 'friends of Honeymoor Common pond'; two of the ponds to be restored through the Herefordshire Pond Celebration and Restoration Project. HART will continue to offer training, maps and general support to enable volunteers to continue surveying and monitoring ponds whilst encouraging volunteers to take a greater interest in their own locality.

The habitat suitability data gathered on ponds to assess their suitability for great crested newts follows Oldham et al., (2000) *Evaluating the suitability of habitat for the great crested newt* but was influenced by an earlier report Swan. & Oldham, *National Amphibian Survey Final Report*. It has been difficult to make the data 'best fit' the generic guidance written in 2000. Inevitably the accuracy of the data has been compromised to a degree. However, in spite of this weakness the results demonstrate good correlation between great crested newt occupancy and the quality of the pond and its surrounding habitat.

5.5 The Pond Celebration and Restoration Project

A second fully-costed follow up project has been drawn up by HART 'the Pond Celebration and Restoration Project'. The successor project focuses on ponds and pond life and aims to involve communities in restoring ponds according to the best pond management advice.

The five ponds within the LEADER+ area have been chosen for restoration:

- Honeymoor Common – Eaton Bishop
- Madley Moat – Madley
- Lower House Orchards – Staunton-on-Wye
- Holme Lacy College
- Ross-on-Wye, Alton Court off Penyard Lane

These sites were selected because of the strength of community commitment towards their restoration. In addition four out of the five ponds contain great crested newts; a National Biodiversity Action Plan (BAP) species. The medicinal leech is found at the Lower House Orchards pond; the latter species is Red Data Book 3 as well as a National Biodiversity Action Plan (BAP) species. All selected ponds will be accessible to the general public.

A main objective of this second project is to increase the profile and importance of ponds, to generate a wider interest and a better appreciation of their biodiversity. The five ponds will be used as an example of this best practice. A series of Pond Celebration Days will also aid communities educating and enthusing people to create or restore their own ponds.

This project will be undertaken in four stages:

1. Education and Training – includes Pond Celebration Days, involving local people and their ponds, and 15 school pond sessions
2. Local Community Involvement – includes consultation with the local parishes of the five ponds, five local Pond Groups set up, and five management plans identified
3. Pond Restoration and Management – for each of the five ponds, includes assessment and surveys of the ponds, photographic records, full restoration plans, and restoration works
4. On-going Monitoring – for each of the five ponds restored, includes providing the local Pond Group with monitoring equipment and information, and assignment of a fully-trained volunteer to each group

6. RECOMMENDATIONS

6.1 Recommendations for great crested newt species recovery

- Pond management is an essential means in aiding great crested newt species recovery. The easiest and often most cost effective management is tree and shrub management to reduce shade which encourages the growth of aquatic flora. Shade reduction is also likely to have a low impact on other pond species. De-silting if undertaken sensitively can be of immense benefit for great crested newts; however, it can also result in detrimental affect on pond flora and fauna unless various safeguards are put in place. It is strongly recommended that pond managers seek professional management advice before initiating a major restoration project such as de-silting. It should also be noted that a wildlife management licence may be needed from Natural England to carry out works which may affect newts. General guidance can be found in the *Great crested newt conservation handbook* and Pond Conservation's *Pond Handbook*.
- Pond creation also has a role to play but has been less popular in Herefordshire than pond restoration projects according to the Rural development Agency (now Natural England) in environmental stewardship schemes. Again advice should be sought from the *Great crested newt conservation handbook* and Pond Conservation's *Pond Handbook*.
- The Herefordshire Ponds and Newts survey just looked at presence and absence for great crested newts. Ponds should also be monitored to establish accurate estimates of population size focusing areas of species deficiency as well as ponds where the population is thought to be 'good' and 'excellent.' This data will inform us how robust or vulnerable populations are within the county. The identification of excellent sites supporting over 100 individuals is a national BAP target. Very little of this type of work has been carried out in Herefordshire.
- If populations are found to be small and therefore vulnerable to changes in habitat or surrounding land use, management can be targeted to safeguard such ponds and /or create adjacent new ponds. This might involve the creation of new ponds close to isolated ponds and the formation of green corridors with suitable terrestrial habitats linking good pond sites with more remote ponds. This is possibly the most effective means of aiding species recovery.
- Any future pond restoration programme should consider using a traffic light system using the existing datasets within the county to prioritise which pond should be managed and to formulate appropriate management tasks.

6.2 The Pond Database

The project has gathered 1000's of aquatic invertebrate and aquatic plant records . This is far above and beyond the aims and objectives of the Project and it is the most comprehensive dataset of its kind within the county. It should be made available for use by other conservation organizations and the public in general. A complete list of all plants and animals recorded during the course of the Project should be put onto a GIS database. It should also be possible to produce an abundance score. Photographs and maps completed during the Project should also be added to the database.

6.3 The New Pond Habitat Action Plan

There is now a new national Pond Habitat Action Plan which is in a draft format. The project has gathered so much detailed information on the county's ponds that it will enable a list of 'priority ponds' to be drawn up (see Pond Conservation's website). Ponds are graded into four categories according to presence of BAP priority species and the occurrence of aquatic invertebrates and flora. Only the 'priority ponds' are covered by the Pond HAP. Pond Conservation reckoned that 20% of ponds nationally fit into the priority grade. This can relatively easily achieved by processing the aquatic plant and invertebrate data. The data once processed and properly displayed can also be used to highlight areas of strategic importance for wetlands within the county for example by illustrating where they are important pond clusters. The information would be best incorporated into a GIS database. The county also has a particularly high concentration of natural ponds which were formed either during or after the last glaciation. The initial evidence suggests that many of our natural ponds are more biodiverse than man-made field and farm ponds and it would be well worth distinguishing those ponds of natural origins. Pond Conservation has also launched the Million Pond Project which aims to create half a million clean water ponds within the United Kingdom. 5000 new high quality ponds will be created between 2008 and 2012. Resource will be allocated to areas of the country where they can show that there are recognized 'hotspots' and/or clean micro-catchments. Herefordshire does have pond 'hotspots' but we do need to process the project's pond data in order to demonstrate the value and importance of these area. This process is necessary so that we can be best placed to receive funding from the Million Pond Project.

Acknowledgements

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Thanks, too, to the Herefordshire Nature Trust for its full support, guidance and advice both in the preparation of the project definition and funding application and during the project itself, including the use of its headquarters, for meetings, and general resource support.

We thank all the pond owners who gave us access to their ponds, the Survey Team Coordinators who organised training and support, and all the volunteers who put in so much time and effort both in surveying ponds and in spending long hours at the Biological Records Centre entering the masses of information collected – without them we would not have been able to complete the project.

We are particularly grateful to: Stephen West from Worcester University for analysis the habitat suitability data on our behalf; to John Baker of the Herpetological Conservation Trust, Francesca Griffith, Margaret Wrenn and members of the HBRC for the careful process of proof reading. We are indebted to all the recorders for their energy and enthusiasm in their contribution to the conservation of these species.

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