Pondwatch JE Level 2 handbook

Thank you for your interest in volunteering to be part of this project. Pondwatch JE is an island-wide effort to record Jersey's pondlife, with the aim of detecting changes in their conservation status. By taking part, you will also be helping us to improve our knowledge on the distribution and habitat requirements of Jersey's pond-dwelling wildlife. It's also a good opportunity for you to spend some time in nature too!

In this handbook you will find out everything you need to know to become a Pondwatch JE surveyor.

Contents:

Level 2 pond surveys

Please note that you must have completed training to carry out Level 2 pond surveys.

Where to survey

You can survey your own pond, a pond you are aware of and know the landowner, a pond the Natural Environment team require monitoring or another of your choice. If you survey a pond of your own choice, you will need to arrange landowner access (see below), whereas ponds provided by Natural Environment will already have landowner permission arranged. Ponds will be assigned to 1-km squares to help ensure there is a representative distribution of ponds being surveyed across the island and to allow results to be compared against previous years. However, multiple ponds per square can be surveyed (though you will need to fill out a separate set of forms for each pond).

If you intend to survey a pond that is mapped but then find that it is no longer in existence, please fill in as much detail about the pond including your contact details and the pond details and return it to your coordinator.

Arranging landowner permission

If you have chosen your own pond, you will need to identify and contact the landowner to arrange permission and fill out a Landowner Survey Consent Form. Landowners can often be identified by making local enquiries or by speaking to Natural Environment. A template introductory letter for requesting landowner permission is available from Natural Environment. Speaking with the landowner will also give you an opportunity to identify car parking locations, safety issues, learn about the pond (e.g. if it is stocked with fish, how often it dries out) and to build a relationship with them. A long-term aim of Pondwatch JE is to gradually build the number of ponds that can be accessed and repeatedly surveyed each year. Do not survey a pond without the landowner's permission.

When to survey

Time of year: The best time of year to survey ponds and other wetland areas is between January and May. This is when ponds are most likely to contain water and Jersey's amphibians are most likely to be seen in and around the water (although they can sometimes be found in ponds both earlier and later than this).

Time of day: The best time of day to spot amphibians depends on the condition of the pond and the methods being used. Therefore, we recommend carrying out surveys at different times of the day with different methods to maximise your chance of spotting them.

Number of surveys: You should aim to survey your pond **five** times between January and May at different times of the day using multiple methods. If you wish to, you can carry out more than five surveys.

Which species to record

You can record any species seen in and around your survey pond. We are particularly interested any observations of Jersey's three native amphibians:

- western toad or crapaud (*Bufo spinosus*)
- palmate newt (*Lissotriton helveticus*)
- agile frog (*Rana dalmatina*)*

*Due to their restricted distribution, agile frogs may be encountered infrequently and so are additionally surveyed through other efforts.

If you see any non-native amphibians or reptiles (e.g. yellow-bellied toads, Japanese fire-bellied newts or terrapins) you should also record these.

If you have received training and feel sufficiently competent, you can opt-in to record some supplementary species. These consist of two groups:

1. Invasive Non-Native (INN) aquatic plants
    a. Water fern (*Azolla filiculoides*)
    b. New Zealand pigmyweed (*Crassula helmsii*)
    c. Parrot's feather (*Myriophyllum aquaticum*)
    d. Canadian pondweed (*Elodea canadensis*)

2. Dragonflies and damselflies (adults and nymphs)

How to survey

Equipment

You will need:

- ☐ a Pondwatch JE Level 2 survey form (available from https://groups.arguk.org/jarg)
- ☐ a pen or pencil
- ☐ a mobile phone (for use in the event of an emergency)
- ☐ a thermometer (for recording air temperature)*
- ☐ a small safety torch (for getting around during night surveys)
- ☐ a high powered survey torch (500,000 to 1,000,000 candlepower)*
- ☐ a pond net*

Optional (recommended):

- ☐ a camera (a smart phone camera is fine)
- ☐ species ID guides
- ☐ map of survey site

*Thermometers and pond nets can be borrowed and signed out from the Natural Environment team (Howard Davis Farm, Trinity). For difficult sites, high powered survey torches can also be borrowed but are limited in availability.

The camera will allow you to take pictures of anything you are not sure about, which can help others check the identification of what you record.

Preparation

Once you have chosen your site and arranged landowner permission (if required), carry out the following:

Step 1: Read and complete the Volunteer Working Agreement Form and return it to Natural Environment.

Step 2: Visit your chosen pond during the day to familiarise yourself with the site and assess any risks. Update the risk assessment as necessary.

Step 3: Record the pond details (name, location, type and construction).

Step 4: Carry out a pond habitat suitability assessment. This assessment is based on a habitat suitability index (HSI) that was developed for the great crested newt in Britain (Oldham *et al.*, 2000). Though there are no great crested newts in Jersey, it is an effective and repeatable way of describing a pond and its surrounding habitats, and has shown to be a good indicator of palmate newt occupancy in Jersey. Pondwatch JE uses nine HSI measures and is described in detail on the survey form. Habitat suitability metrics are described in the habitat assessment section of this handbook, and in other resources.

Step 5: Assess the habitat surrounding the pond. To do this, you will need to identify the three most dominant habitat types occurring within a distance of 0–5 m of the pond perimeter, and 0–100 m of the pond perimeter. Habitat definitions are given on the survey form, and greater detail is available in the habitat assessment section of this handbook, and in other freely-available resources.

How to survey

Please complete **five** surveys if possible between January and May, carrying out the following steps:

Step 6: At the start of each survey first record the visit number, date, the start time, air temperature, whether or not there is bright moonlight (night surveys only) and if wind is disturbing the water. Also record the water clarity, rainfall (choosing the most recent applicable option) and which (if any) supplementary species you are recording.

Step 7: Spend 30–60 minutes using any of the following three methods to survey the pond, aiming to use all three methods across your multiple survey visits. **Remember**, much of Jersey's wildlife is protected by law, and should not be harmed, taken or possessed, nor should their breeding or resting sites be disturbed.

- **Visual search:** This involves walking once around the pond edge, looking for amphibians, their eggs and other pondlife. Toad spawn strings and frog spawn clumps are fairly easy to spot, but newt eggs will be folded in to leaves individually and may be harder to spot so keep an eye out for any folded leaves and inspect them for eggs. If the pond is too large to walk around, indicate the percentage of shoreline surveyed on the form.

- **Netting:** This is particularly useful for ponds with submerged vegetation. Work your way around the pond perimeter in two-metre sections; netting two metres of submerged vegetation then moving two metres along the perimeter before netting another two-metre section. Check the contents of the net after each section, identify any wildlife found, carefully return it to the pond and record what you found. Take pictures if you are not sure of a species identification.
  Pond vegetation is often in patches rather than continuous, and netting in open water is less effective than in vegetation. Therefore, you may wish to select vegetated areas of the pond to net. Record the percentage of shoreline netted on the survey form.

- **Night time torchlight survey:** This technique requires visiting the pond after dusk using a high-powered (500,000 to 1,000,000 candlepower) torch. As with netting, you should split the bank in to two-metre sections, surveying as many accessible sections as possible and recording the percentage of pond perimeter searched on the survey form. At each two-metre section you should move the torch away from the bank and then back towards you in order to cover the area of pond within a segment determined by the two-metre stretch of bank.
  You can undertake a torchlight survey on the same or a different day as other survey methods have been used, but you must make sure that any netting earlier in the day has not resulted in silt being stirred up thereby reducing visibility for the torchlight survey.

Step 8: Record any wildlife you see (especially amphibians and supplementary species). Do not attempt to touch or handle any animals. When you encounter an animal during your survey, record as much of the following information as possible: the time, species, lifestage, sex, quantity and certainty of your identification (**C**=certain, **U**=uncertain). For spawn, frog egg clumps can be counted but it can be difficult to count toad spawn strings and palmate newt eggs. Similarly, tadpoles can be difficult to count. For these categories you should therefore estimate a range (e.g. 10–20) that you think is suitable.

Note that both types of supplementary species (dragonflies and damselflies (excluding nymphs) and Invasive Non-Native aquatic plants) should only be recorded during the day. Further information on identification of the supplementary species is available in this handbook and in the additional resources.

Step 9: At the end of the survey you should record the end time, the percentage of shoreline that you surveyed and indicate which methods you used during the survey. If you used a net, you also need to record the percentage of shoreline netted.

Step 10: Once you have completed all of your surveys, record any supplementary information, including the date you first saw spawn in your pond (if applicable), if toads have been run over on nearby roads and if a grass snake has been seen in the pond.

Step 11: *OPTIONAL*: You can also carry out simple water quality tests at your pond (see 'Measuring water quality'). Please indicate if you have done a water quality test at this pond.

Step 12: Submit your results, **even if you don't see anything**. Absence data is very useful.

Safety

It is very important to make sure you are safe at all times during your survey. Working at night can present greater risk, so if you do want to look for pondlife at night you should make sure you first visit the pond during the day to assess any risks before visiting at night. If you have concerns, then you should not proceed with the survey. A risk assessment template is available at the end of this handbook which you should modify to your needs. You are under no obligation to participate or complete the survey.

Note that you do not need to enter the pond to conduct a survey and should only survey from accessible banks. Avoid surveying areas with steep banks or wet muddy ground. Carrying a fully charged mobile phone is also advisable in case of emergency.

It is best to do your survey with someone else, but if you are on your own then make sure you tell a responsible person where you will be and when you expect to be back. Lone working procedures are described in the Volunteer Working Agreement.

Biosecurity

Amphibians are globally at risk from amphibian diseases. Furthermore, ponds can contain Invasive Non-Native aquatic plants. Both diseases and invasive plants can easily be transferred on equipment, footwear, clothing or other surfaces. It is therefore important that equipment and other items are properly cleaned and disinfected between surveys and between ponds. For further advice, see ARG UK Advice Note 4. *Amphibian disease precautions: A guide for UK fieldworkers* and the Check Clean Dry campaign.

Submitting your results

Once you have finished your survey, make sure you submit your data. The preferred way is using the online forms at http://jerseybiodiversitycentre.org.je. Alternatively, you can email a copy of your form to jbc@societe-jersiaise.org or post it to:

Pondwatch JE
Natural Environment, Growth Housing and Environment
Howard Davis Farm
Trinity
JE3 5JP

If you are carrying out a Level 2 survey, you will need to be invited to fill out the appropriate online forms by your coordinator.

Please only submit your data using one method, as submitting through multiple avenues can lead to information being duplicated.

Resources

The survey forms, species ID guides and all other information needed for completing pond surveys are available on the Jersey Amphibian and Reptile Group (JARG) website: https://groups.arguk.org/jarg.

Survey results can be submitted online to the Jersey Biodiversity Centre (JBC): http://jerseybiodiversitycentre.org.je.

Useful links:

Species Identification

GB non-native species secretariat (Invasive Non-Native aquatic plants) - http://www.nonnativespecies.org/home/index.cfm

British Dragonfly Society (Dragonflies and Damselflies) - https://british-dragonflies.org.uk/

Insects of the Channel Islands Facebook group (Insects) - https://www.facebook.com/groups/518340844961982/

Jersey Wildlife Facebook group (all wildlife) - https://www.facebook.com/groups/225539340841170/

Other

Amphibian and Reptile Groups of the UK (Up to date guidance for Amphibian and Reptile Groups) - https://www.arguk.org

ARG UK Advice Note 5 Great Crested Newt Habitat Suitability Index - https://www.arguk.org/info-advice/advice-notes/9-great-crested-newt-habitat-suitability-index-arg-advice-note-5/file

Jersey Amphibian and Reptile Group Surveyors Discussion Page (Facebook) - https://www.facebook.com/groups/590112634750709/

UK Habitat Classification (habitat classification documentation and guidance) - http://ecountability.co.uk/ukhabworkinggroup-ukhab/

Growth, Housing and Environment,
Howard Davis Farm, La Route de la Trinité,
Trinity, Jersey, JE3 5JP
Tel: 01534 441600
Email: environmentenquiries@gov.je

Volunteer Working Agreement Form

ARG UK
Amphibian and Reptile Groups of the UK
VOLUNTEERS WORKING FOR THE CONSERVATION OF AMPHIBIANS AND REPTILES

This form is for the purpose of registering as a volunteer with Jersey Amphibian and Reptile Group (JARG) affiliated under ARG UK CIO (Charity no 1165504) part of ARG UK. I understand that I am not under any obligation to carry out voluntary work for ARG UK nor is ARG UK under any obligation to use my services.

Volunteer details

Full name:		Contact number:	
Correspondence address: Post code:			
Emergency contact name:		Emergency contact number:	

Important information

Before signing this form please read the following consent information carefully. It explains how your information will be used and provides a brief description of your rights under Jersey's Data Protection Law. For further information on how the Department of the Environment handles personal data please visit http://www.gov.je/howweuseyourinfo

Your Consent - I am aware and agree

That the personal information supplied in this form, together with any other accompanying information, to be used for the sole purpose of processing my application to volunteer for ARG UK and I understand that it's an offence to knowingly submit false or misleading information with an application.

To my personal information being shared with your insurance provider in the event that it is necessary for me to make an insurance claim.

That any information I collect during my volunteering activities will be shared with other interested parties (such as the Jersey Biodiversity Centre) and will be used to provide published statistical data and reports.

I understand that under Jersey's Data Protection Law I have the right to withdraw my consent to the further processing of my information. (Should you wish to exercise this right please contact us on tel. 441600)

I have received sufficient training and/or instructions for the planned activities and believe that I am fit and healthy enough to carry out the voluntary work involved. I understand that it is my responsibility to consult my doctor if I have any concerns about my health prior to carrying out any volunteer work for JARG Jersey.

I understand that I should not do anything that I do not feel qualified to do and that I should not put others or myself in danger during the course of any voluntary activities and that I should contact the JARG Jersey co-ordinator for further advice and/or training if necessary.

I have read and understood the Surveying and Monitoring Risk Assessment (attached) and Lone Working Procedures (detailed below). I understand that the purpose of these documents are to remind me of any potential risks and I should use these to make my own assessment(s) prior to commencement of each volunteering activity.

I understand that I will not be covered in full by States of Jersey insurance unless I sign and return this form to the JARG Co-ordinator at the address above.

Volunteer consent

Signature:			
Name:		Date:	

Lone Working Procedures

The aim of the Lone Working Procedure is to ensure that there is always someone who knows where you are working so that you can be located and/or contacted in the event of an emergency. JARG strongly advise you to follow these procedures, but it is up to you to use them appropriately and responsibly.

The Lone Working Procedures should be applied to situations where a person is working alone. Lone working should take place only if you are confident that you are safe and able to work alone.

An assessment should be made of whether lone working is appropriate. Can the risks be minimised if more than one person is involved? Is the scope of the work such that it should not (or must not) be undertaken by a lone worker? The task needs to be assessed against our approach to undertaking Risk Assessments.

For all lone working, a 'buddy system' should be operated, whereby a buddy is nominated and informed of:

1. Location(s) of lone working (changes in itinerary need to be reported to the buddy).
2. Reporting-in times or estimated time of arrival (the frequency of reporting-in should be determined on the basis of risk and changes of location).
3. Contact details.
4. Travel/vehicle details (particularly important in the event of requiring emergency assistance.
5. The Emergency Procedure in the event of not calling in.

This information should be supplied to the buddy in a suitable format (e.g. in writing or phone message) which can be referred to in the event of an emergency.

Any changes in itinerary should be communicated to the buddy; this may require leaving messages on answerphones or mobile phones (buddies should check for messages before implementing emergency procedures). A third party may also be used to convey a message.

The lone worker is responsible for phoning ('reporting in') on time. Take account of the possibility of poor mobile phone reception, phones being lost or damaged, phone batteries running out, or that your buddy may be driving or doing some other activity that prevents them from using the mobile phone. A contingency must be in place for such events.

Emergency procedures: In the event of the lone worker not 'reporting in' the buddy should carry out the following:

Between half an hour and an hour after the due 'reporting-in' time, the buddy should call the lone worker on the number(s) given. If there is no response, they should leave a phone message with the time of the call, and state that the Lone Worker is overdue for reporting in.

Repeat this after 15 minutes, and a third time up to one hour after the due reporting-in time. This will give the lone worker one hour after the deadline to respond. If there is still no response then the Buddy should exhaust all other options before calling the emergency services.

If still unable to contact or locate the lone worker, the buddy should call the local police (use 999 only if you are sure there is an emergency, though it is better to err on the side of caution). The police should be advised of the Lone Working Procedures, the areas being visited, travel details, any known risks, reporting in times and any contact details; and they should leave a contact number should further information be required. If any other emergency services are involved, the buddy should also advise them of the details provided by the lone worker, notably the areas being visited, travel details, any known risks, reporting-in times and contact details.

Note: Mobile phones should not be used while driving or undertaking certain activities

Habitat assessment

This section gives a detailed explanation of how habitat assessments should be carried out, and the habitat classifications and measurements that Pondwatch JE uses. This will help us compare surveys across years, assess changes in the habitat over time and calculate which habitats are best for which species.

Pond type and construction

The survey form asks you to tick the most appropriate type and construction of pond from a list of multiple choices. These are described in more detail in Tables 1 and 2.

Table 1 Description of pond types.

Pond type	Description
Formal garden pond	Standing or still waters between 1m^2 and 2 ha in area which may be permanent or temporary. Includes both man-made and natural waterbodies occurring within a garden or within the boundary of your curtilage. The pond is heavily manicured.
Wild garden pond	As above but the pond is not heavily manicured.
Fish pond	Any standing or still waters between 1m^2 and 2 ha in area which may be permanent or temporary and are stocked with fish (e.g. goldfish or koi).
Farm pond	Any standing or still waters between 1m^2 and 2 ha in area which may be permanent or temporary occurring on a farm.
School pond	Any standing or still waters between 1m^2 and 2 ha in area which may be permanent or temporary occurring on school grounds.
Golf course pond	Any standing or still waters between 1m^2 and 2 ha in area which may be permanent or temporary occurring on a golf course.
Natural pond	Any standing or still waters between 1m^2 and 2 ha in area which may be permanent or temporary that occurs naturally (i.e. without human interference).
Lake	A body of still water >2 ha in area, includes reservoirs and gravel pits.

Table 2 Description of pond construction types.

Pond construction	Description
Liner	Water is retained by a liner (e.g. butyl).
Preformed plastic	Water is retained by a preformed plastic shell.
Concrete	Water is retained by a layer of concrete.
Clay	The pond has no liner but water is retained by clay.

Habitat suitability

Pondwatch JE uses habitat suitability measurements developed for the great crested newt in Britain (Oldham *et al*., 2000) that are considered to be a useful assessment of pond quality. Analysis of data from the National Amphibian and Reptile Recording Scheme (NARRS) in Jersey has also shown this index to be correlated with palmate newt occupancy.

The habitat classifications

Pondwatch JE uses 18 habitat classes to define terrestrial and freshwater habitats (Table 3), as described in Level 3 of the UK Habitat Classification Scheme (UK Habitat Classification Working Group, 2018). Further detail on the habitat definitions, their development and relation to other habitat classification schemes are available online at http://ecountability.co.uk/ukhabworkinggroup-ukhab/.

How to assess the habitats in and around the pond

To assess the habitat in and around the pond, follow the approach outlined in the steps below:

Step 1: Visit your survey site during the day, **before** carrying out your first survey and assess the risks associated with surveying it. If you are happy to continue then proceed to the next step.

Step 2: Recording habitat suitability measurements:

a. Estimate the area of the pond in m^2 by first identifying the outer perimeter of the pond. This is the perimeter when the water is at its highest level (often in early spring), and may be identified by plants such as rushes present at the pond's outer edge. You can measure the pond using an online map or by measuring it in the field. To do this, it is easiest to consider the pond as a series of geometric shapes for which you individually calculate the area and then sum the shapes together. 'Regular' shaped ponds are therefore easier to calculate than irregular ponds. The length of a side can be estimated by pacing (where a single pace is ~0.8–1.0 metre).
b. Working out how often the pond dries is best done by speaking with landowners or those familiar with the pond. Alternatively, you may have to make an informed guess based on the water levels when you carry out your surveys. Seasonality should also be factored in. For instance, a pond that is dry by late spring is likely to dry out most years.
c. Water quality (not to be confused with water clarity) is measured on a subjective index of aquatic invertebrate diversity.
    i. Bad quality is considered as being clearly polluted, containing only pollution-tolerant invertebrates (such as rat-tailed maggots), and with no submerged plants.
    ii. Poor water quality contains low invertebrate diversity (e.g. species such as midge and mosquito larvae) and few submerged plants.
    iii. Moderate water quality is associated to moderate invertebrate diversity.
    iv. Good water quality is that which supports an abundant and diverse invertebrate community. Netting reveals handfuls of diverse invertebrates, including groups such as mayfly larvae and water shrimps.
d. The percentage (%) of perimeter shaded is calculated as the area shaded where shading occurs up to at least 1m from the shore. Shading is usually from trees, but can also include buildings. However, it should not include emergent pond vegetation. This estimate should be made between May and the end of September.
e. The impact of waterfowl (I.e. ducks, geese and swans) is measured across three categories:
    i. Absent – No evidence of waterfowl impact though moorhens might be present.
    ii. Minor – Waterfowl are present, but there is little indication of an impact on pond vegetation. The pond still supports submerged plants and banks are not denuded of vegetation.
    iii. Major – There is a severe impact of waterfowl. There is also little or no evidence of submerged plants, the water is turbid, pond banks show patches where vegetation has been removed and there is evidence of waterfowl being fed.
f. The presence and abundance of fish is measured across four categories, with information on their presence best gleaned from local knowledge and the surveyor's own observations. Pond owners are often aware of stocking with fish for commercial or aesthetic reasons. However,

stickleback (which can be significant predators of newt larvae, when present in large numbers) are unlikely to be deliberately introduced to a pond, but may arrive through other means. Netting is useful in detecting smaller fish, such as sticklebacks, or the fry of larger species.

g. The number of ponds occurring within 1 km of the survey pond is an optional measure. The count should not include the survey pond itself, nor should it count ponds that are completely isolated from the survey pond (e.g. due to barriers such as main roads). If you are unsure, your survey coordinator may be able to calculate the number of ponds using map data held by Natural Environment.
h. The scoring of terrestrial habitat is done over four categories, and requires the surveyor to have a good understanding of newt habitat quality. Though the metric was designed to consider great crested newt terrestrial habitat, we replace that with good terrestrial habitat for palmate newts. Good terrestrial habitat offers cover and foraging opportunities, and includes meadow, rough grassland, hedges, scrub and woodland. Again we do not consider terrestrial areas that are isolated from the survey pond by barriers to dispersal (e.g. by main roads or poor habitat). The four categories are:
    i. Good – An extensive area of habitat that offers good opportunities for foraging and shelter completely surrounds the survey pond (e.g. rough grassland, scrub or woodland).
    ii. Moderate – The terrestrial habitat offers opportunities for foraging and shelter, but may not be extensive in area and does not completely surround the survey pond.
    iii. Poor – The terrestrial habitat has poor structure, offering limited opportunities for foraging and shelter (e.g. amenity grassland).
    iv. None – There is clearly no suitable habitat around the survey pond (e.g. it is within a large expanse of bare terrestrial habitat).
i. The final metric requires you to measure the cover of aquatic vegetation on the surface of the pond, including emergent plants, floating plants (excluding duckweed) and submerged plants that reach the surface. This should be estimated between March and May. Figure 1 can be used as a guide for estimating aquatic vegetation cover.

Step 3: Assessing the habitats **around** the pond:

a. Identify the perimeter of the pond (as described in step 2a).
b. Look at the habitat within 0–5 m of the pond perimeter, and tick the three most dominant habitat classifications that apply within this area. The habitat classifications are shown in Table 3 below and on the survey form. An example is shown in Figure 2.
c. Repeat step 3b, this time assessing the habitat within 0–100 m of the pond perimeter.

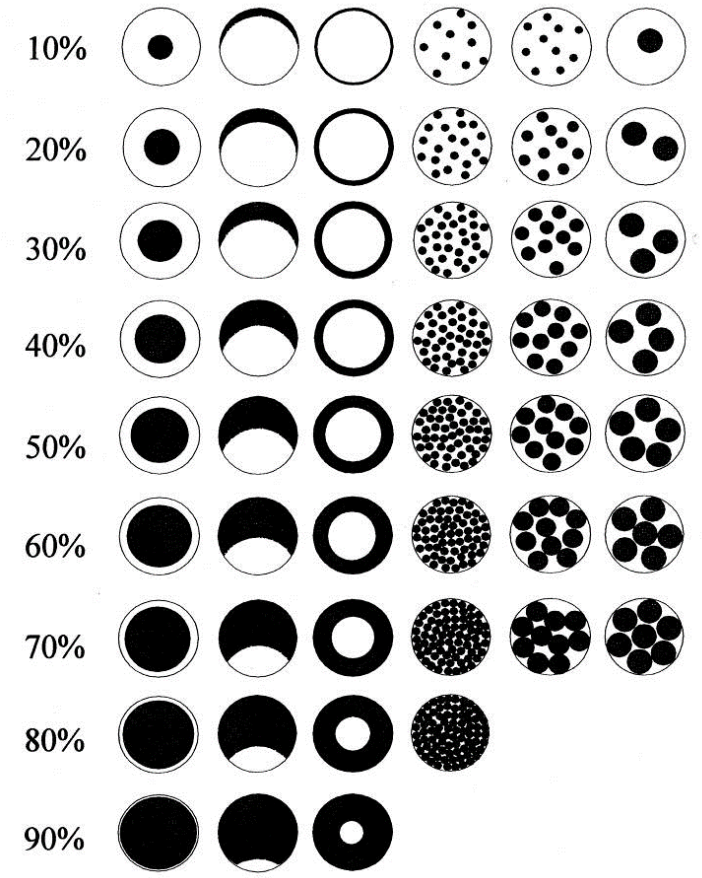

Figure 1 Visual guide for use in assessing the percentage of vegetation cover in a pond (ARG UK, 2010).

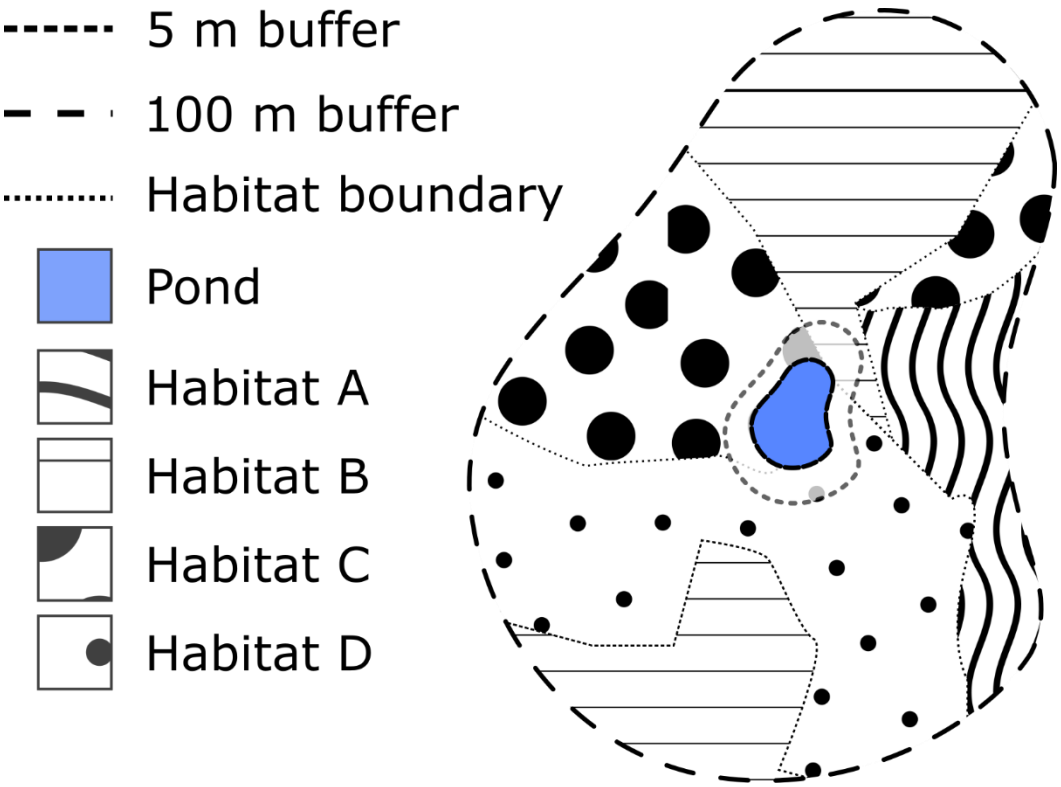

Figure 2 Example of habitats falling with 0–5 and 0–100 m buffer zones from the pond perimeter. In this example, habitats B, C and D are the most dominant in both the 5 metre and 100 metre buffer zones.

Table 3 Habitat classifications for Pondwatch JE, adapted from the UK Habitat Classification (UK Habitat Classification Working Group, 2018). For more information on habitat definitions see the UK Habitat Classification Documents at http://ecountability.co.uk/ukhabworkinggroup-ukhab/.

Lev. 1	Level 2	Level 3
Terrestrial	Grassland	**g1**: Acid grassland
		g2: Calcareous grassland
		g3: Neutral grassland
		g4: Modified grassland
	Woodland and forest	**w1**: Broadleaved mixed and yew woodland
		w2: Coniferous woodland
	Heathland and shrub	**h1**: Dwarf shrub heath
		h2: Hedgerows
		h3: Dense scrub
	Wetland	**f1**: Bog
		f2: Fen marsh and swamp
	Cropland	**c1**: Arable and horticulture
	Urban	**u1**: Built-up areas and gardens
	Sparsely vegetated land	**s1**: Inland rock
		s2: Supralittoral Rock
		s3: Supralittoral Sediment
Freshwater	Rivers and lakes	**r1**: Standing open water and canals
		r2: Rivers and streams

Measuring water quality

(This information has been sourced from the Freshwater Habitats Trust and Earthwatch FreshWater Watch websites. Learn more at https://freshwaterhabitats.org.uk/ and https://freshwaterwatch.thewaterhub.org/content/your-test-kit.)

Plants and animals living in freshwater environments can be badly affected by pollution from many sources. Pollutants can introduce excess nutrients in to the environment, which can lead to unnatural increases in algae, plant cover, fungi and bacteria. These increases can make aquatic habitats uninhabitable for many species, for instance due to reduced oxygen in the water. By testing the water quality of your pond you will help us find out which areas are still good for wildlife and which are in need of help.

What you will need to do

1. Request a water quality kit from the project coordinator (email N.Cornish@gov.je).
2. Using a survey form, record the location of the pond.
3. Collect a water sample from the pond.
4. Use the nutrient testing kits to measure nitrate and phosphate pollution in the water.
5. Submit your results online at http://jerseybiodiversitycentre.org.je/.

The equipment

If a water quality test needs to be done in your chosen area, a kit will be sent to you containing:

- nitrate water quality testing tubes
- phosphate water quality testing tubes
- colour charts for use with testing tubes
- plastic or latex gloves
- sample cup

You will also need

- a Pondwatch JE water testing survey form (available from https://groups.arguk.org/jarg)
- a mobile phone (in case of emergency)
- a pen or pencil to write with
- a smartphone to record the pond coordinates (optional)

How to collect the sample (also see Figure 3)

Step 1: Put on some disposable plastic or latex gloves, particularly if you have any cuts the water could get in to.
Step 2: Rinse out the sample cup in the pond water and submerge it to fill it halfway with water (don't just scoop up some surface water).
Step 3: Take the sample cup containing water somewhere safe you can carry out the water tests (e.g. somewhere flat near to the pond).
Step 4: Get out one phosphate and one nitrate tube. The phosphate is marked P on the base of the tube, and the nitrate is marked N.
Step 5: Pull out and discard the yellow pin leaving a small air hole.
Step 6: With the air hole pointing upwards, use your finger and thumb to squeeze out the air.
Step 7: Keeping the air squeezed out, turn the tube upside down and insert below the water in the sample cup.
Step 8: Gently release the pressure and suck up enough water to fill the tube just over half way.
Step 9: If you need to, turn the tube upright again, squeeze out a bit more air to suck up more water to just over half way.
Step 10: Gently shake the tube to mix the water and powder inside.
Step 11: Make a note of the time and wait for the colour reaction (**Nitrate: 3 mins, Phosphate: 5 mins**)

Step 12: Compare the tube with the colour chart as soon as the time is up, as the colour will continue to develop.

Step 13: Record the results on the survey form and submit them online or via email.

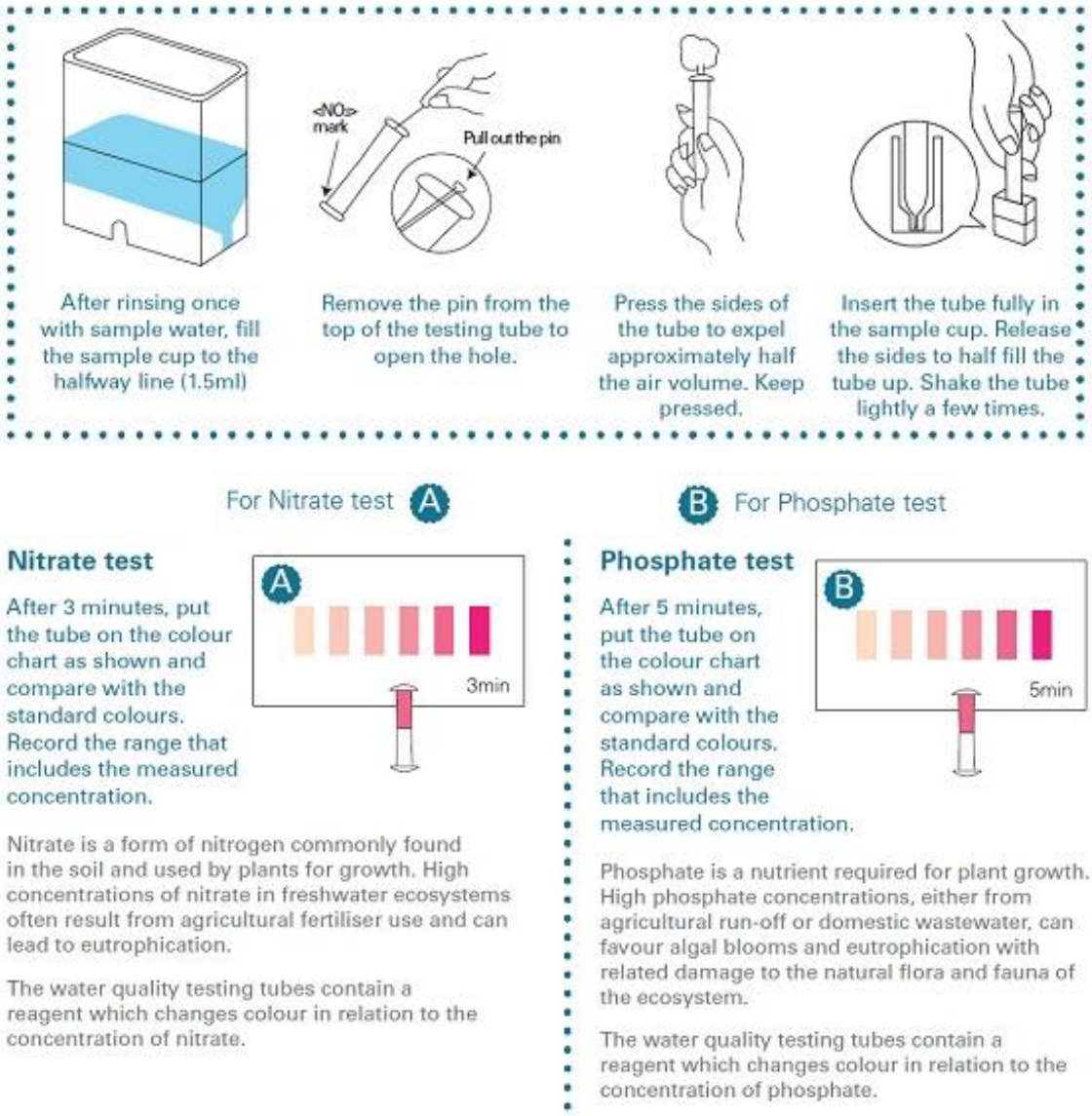

Figure 3 Visual guide to analysing water quality. Source: EarthWatch Institute

Identifying supplementary species:

Invasive Non-Native aquatic plants

(This information has been sourced from the GB non-native species secretariat website. Learn more at http://www.nonnativespecies.org.)

Invasive non-native aquatic plants can be identified using resources from http://www.nonnativespecies.org. This includes a free e-learning course which includes a module on invasive freshwater plants. We recommend that you take this course before recording these species. The four species we are interested in are:

- Water fern (*Azolla filiculoides*)
- New Zealand pigmyweed (*Crassula helmsii*)
- Parrot's feather (*Myriophyllum aquaticum*)
- Canadian pondweed / waterweed (*Elodea canadensis*)

Species information summary

	Water fern	New Zealand pigmyweed	Parrot's feather	Canadian pondweed
Structure	Mats made up of many separate tiny plants, each approximately 2.5 cm long.	Forms thick mats underwater and on the margins of water bodies, with different growth forms: • Terrestrial and emergent - short, thick stems and fleshy leaves. • Submerged - usually have thin stringy stems and flatter, less fleshy leaves.	Emergent stems up to 2 m tall. Grow submerged and in an emergent form (i.e. growing up out of the water) in still or slowly flowing water.	Submerged aquatic species up to 3 m in length occurring in still or slow-flowing shallow or deep water.
Timing	May be seen most months of the year but are not very frost tolerant.	Perennial (found throughout the year).	Dies down in winter and can be found submerged throughout the year. Emergent shoots appear in spring. Flowers are present from May to August.	Perennial (found throughout the year). Flowers are produced June to September.
Flowers		Very small whitish-green to slightly pink flowers may be present, each with 4 petals.	Inconspicuous.	Tiny and inconspicuous and petals white or white tinged with red and borne on the end of a very long thread-like emergent stalk.

	Water fern	New Zealand pigmyweed	Parrot's feather	Canadian pondweed
Leaves	Green during spring / summer, turning red during cold weather in autumn / winter. Have a rough, granular appearance and non-wettable surface.	Bases join around the stem forming a collar. Up to 2cm long, in opposite pairs around stem.	Blue-green in whorls (circular arrangement) of 4–6 around the stem. Each is finely divided, making them appear feather-like. Emergent leaves are more robust than those submerged. Stem breaks easily and has brown roots present around nodes.	Up to 2 cm long, in whorls of 3, widest at the middle and either pointed or rounded at the end.
Similar species	Duckweeds (*Lemna sp.*); small free-floating native plants which, similar to water fern, can cover still or slow-moving fresh water. Distinguished by their leaves and roots. Duckweed plants are much smaller (max. 5mm). Duckweed leaves are always vibrant green, small and flat. They also have single white to green roots that hang down from the leaves, unlike the clumps of dark roots seen in water fern.	Water starwort spp. (*Callitriche spp.*). This native can be distinguished as it has delicate non-fleshy leaves with flat or slightly notched tips. When removed from the water, water starwort's leaves and stems also readily flop whereas New Zealand pigmyweed remains more rigid. Water starwort forms rosettes of leaves which lie flat on the water's surface.	*Myriophyllum* species. This closely-related native can be distinguished as it does not have emergent leaves (though may produce short emergent flower spikes). Parrot's feather also usually grows from the bank in to a water body, whereas native *Myriophyllum* species usually grow up from the bed of the water body. Parrot's feather is typically more robust than the native species. Parrot's feather is rarely (if ever) found in fast-flowing water, unlike some native *Myriophyllum* species. Mare's-tail (*Hippuris vulgaris*); superficially resembles parrot's feather and grows in similar habitats. Can be distinguished as mare's-tail produces whorls of simple, undivided leaves unlike the feather-like leaves of parrot's feather. Although mare's-tail grows in ponds, streams, lake margins and other damp habitats, it grows in less dense colonies than parrot's feather.	Nuttall's waterweed (*Elodea nuttallii*); usually found in more nutrient-rich water than *E. canadensis*. It is difficult to distinguish between the two *Elodea* species. Nuttall's waterweed has leaves up to 3.5 cm long, in whorls of 3–4, widest at the base and tapering to a pointed end. Curly waterweed (*Lagarosiphon major*); a non-native which has leaves spiralled at the base, not in whorls. Leaves are up to 3 cm long, flowers are inconspicuous with reddish petals.

Dragonflies and damselflies

(This information has been sourced from the British Dragonfly Society website. Learn more at https://www.british-dragonflies.org.uk/content/dragonfly-and-damselfly-identification-help.). Also see the dragonfly and damselfly ID guide.

Dragonflies and damselflies can be recorded at three levels. In order of difficulty these are:

1. Was it a dragonfly or damselfly?
2. If a dragonfly, what sort of dragonfly?
    - Hawkers and similar species
    - Darters, chasers and skimmers
    - Emeralds
3. What species was it?

To help you identify adults, it is important to pay attention to head markings, eye colouration, markings on the thorax (side and dorsal), leg colouration, markings on the abdomen (side and dorsal), anal appendages and wing markings. Looking at the way that it flies and rests is also useful. Taking clear photos (one from above and one from the side) are the best way of checking the species is identified correctly, and can allow others to help you.

To identify nymphs, you should pay attention to the body shape and the rear appendages.

Step 1. Dragonfly (suborder = Anisoptera) or damselfly (suborder = Zygoptera)?

Feature	Dragonfly	Damselfly
ADULTS		
Body	Robust	Thin and delicate
Wing position at rest	Open	Closed*
Wing shape	Different between front and back	Same between front and back
Eye position	Touching at the top of the head*	Not touching at the top of the head
Flight	Strong and purposeful	Weak and fluttering
NYMPHS		
Rear appendages	Stiff, short and spiky (x 5)	Soft and flexible gills (x 3)
Body	Stout	Long and slender

* for most species

Step 2. What sort of dragonfly (adults only)?

Hawkers and similar species	Darters, chasers and skimmers	Emeralds
Generally dark with bright spots or stripes. Some mostly brown. Can be brightly coloured with a thick black mid-line stripe. Never with dark wing marks other than the wingspots (rectangular marks at the tip). Generally large, robust but thin bodied.	Generally have a blue, red, yellow or brown body or a combination of some of these colours. Sometimes with black markings. Some with additional dark marks on the wings. Generally smaller and stout bodied.	Almost entirely emerald green coloured, usually metallic. Often bright green eyes. Sometimes with bronze tints.

Step 3. What species (adults only)?

Compare your notes and photos against a guidebook or using the resources at https://www.british-dragonflies.org.uk.

ARG UK Generic Risk Assessment (modified for Jersey)

	Hazard	Risk	Control measures	Probability	Comment
1	Assault	Physical injury, sexual assault	Try to defuse any potentially confrontational situations. If possible, walk away. Contact police if unsure or feel threatened. Apply Lone Working Procedures.	Low	
2	Stings and bites	Diseases, allergic reaction	If known allergy to stings take appropriate medication on site. If feeling unwell after a site visit seek medical attention.	Moderate	
3	Ticks	Transmission of Lyme disease	Be aware of ticks (e.g. BADA-UK www.bada-uk.org) and take precautions in the field. Wear long trousers and long sleeves, use insect repellent, avoid brushing through tall vegetation, check clothing for ticks, consult a doctor in the event of tick bite.	Low to high depending on whether ticks present locally.	
4	Pond (etc.) water	Pond water may contain bacteria that may cause disease (e.g. *Leptospirosis*/ Weil's disease).	Treat all pond (etc.) water as potentially pathogenic. Do not ingest, do not expose cuts on skin to pond water. Wear gloves to protect against scratches when working near water. Wash hands after immersion in pond water and especially prior to eating. If feeling unwell after accidental ingestion of pond water or contact with open wound seek medical attention.	High	
5	Ponds /deep water	Drowning	Take care when near water bodies. Do not lone work near water bodies. Take throw-rope when working near water.	Moderate	
6	Cold	Hypothermia	Wear appropriate clothing. Inform group leader if feeling cold.	Low/Moderate in winter	
7	Concealed holes/ ditches	Physical injury, ankle injuries	Take care when walking through areas of deep habitat or areas where there is poor footing visibility. Avoid areas of poor footing visibility is possible.	High	
8	Dogs	Bites, lacerations, disease	Be wary of dogs off leads. Disinfect any bites and seek medical attention.	Moderate	
9	Exposure to sun	Sun burn	Where appropriate use sunscreen. Avoid midday sun if possible.	High	

10	Hazardous waste/fly tipping	Cuts, lacerations, chemical burns, infection	Wear gloves when handling waste. If unsure of contents of containers or if known to be hazardous contact emergency services.	Moderate	
11	Heat and difficult terrain	Exhaustion, dehydration	Walking difficult terrain will cause extra fatigue in hot weather. Do not rush and drink plenty of water.	Low	
12	Old and partially buried structures (eg buried fences)	Tripping, ankle injuries	Take care when footing is not clearly visible. Look for signs nearby of structures e.g, partially collapsed fence.	Moderate	
13	Sharp grasses and thorny bushes	Eye injuries, cuts, lacerations, infection	Do not bend down or kneel in areas of Sharp sea grass or other sharp plants. Disinfect any lacerations or punctures	Moderate	
14	Sharp objects (eg tins)	Cuts, lacerations, infection	Take care when picking up any potentially sharp objects. Wear gloves if appropriate or desired.	High	
15	Shooting	Physical injury	Do not approach any person suspected of carrying a weapon. If there is shooting allowed on site establish where and when shooting will take place and avoid. In cases of unauthorised shooting contact the police.	Low	
16	Steep slopes/ unstable ground	Physical injury, trips, ankle injuries	Try to avoid climbing steep slopes. Take care with footing.	Moderate	
17	Stock	Physical injury, trampling	Be aware of stock behaviour, if in doubt leave site. Do not take dogs on site.	Moderate	
18	Tree felling	Injury from felled timber	In forestry plantations look out for indications of felling in progress (posted notices, sounds of felling activity). Avoid areas where/when felling is in progress.	Low	
19	Working with children	Harm to children or allegation of improper behaviour made against adult	Ensure that any children attending an activity do so under the responsibility of a guardian.	Low	

Activity _____ Date _____ Assessor _____

Amphibian and Reptile Groups of UK (ARG UK) is a registered charity (number 1165504) committed to the conservation of native amphibians and reptiles and their natural environment by supporting the development of a network of independent volunteer amphibian and reptile groups (ARGs)

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States of Jersey

Landowner Survey Consent Form

I hereby agree to grant permission for ecological surveys to be carried out on my property/land by volunteers taking part in **[_____]** recording survey, coordinated by **[_____]**

Full name and title	
Address of property/land to be surveyed	
Contact telephone number	
E-mail address	

Important information:
Before signing this form please read the following consent information carefully. It explains how the personal data will be used and provides a brief description of an individual's rights under Jersey's Data Protection Law. For further information on how the Department of the Environment handles personal data please visit http://www.gov.je/howweuseyourinfo

Consent
I am aware and agree to the personal information supplied in this form, to be used for the sole purpose of recording my consent to ecological surveys being carried out on my land under. I also agree to my personal information being shared with your insurance provider in the event that it is necessary for the volunteer to make an insurance claim.

I am aware and agree that any survey data that is collected by volunteers on my land will be shared with other interested parties (such as the Jersey Biodiversity Centre) and will be used to provide published statistical data and reports and you will only do so, where possible, after you have ensured that sufficient steps have been taken to protect my personal data unless it is legally required to do so.

Your right to withdraw consent
Under Jersey's Data Protection Law you have the right to withdraw your consent to the further processing of your information at any time. If you wish to exercise this right please contact the Department of the Environment on 441600.

Signature……Print Name: …….. Date…….....

Sources

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