

Priority Pond Assessment Survey (PASS) Guide

This document provides guidance for completing a Priority Pond Assessment (PASS) survey. The survey form and video presentation can be found on our website.

What is a pond?

A pond is a body of standing water between 1m² and 2 ha in area which holds water for at least 4 months of the year.

What are Priority Ponds?

Priority ponds are waterbodies that have a particularly high conservation value: usually because they support important freshwater species or rare community types.

Ponds were first identified as priority habitats in 2007. The term 'Habitat of Principal Importance' is now more correctly used for priority ponds.

In many cases these ponds provide:

- a last refuge for freshwater plants and animals that are now lost from surrounding areas
- stepping-stones for freshwater species that increasingly need to move across the landscape as their habitats are disrupted by climate change
- a hot-spot which allows declining species to spread when landscape improvements are made.

Priority Pond numbers

It was originally estimated that around 20% of the UK's 500,000 or so ponds (excluding garden ponds) would meet one or more of the priority pond criteria.

So far fewer than 2% of ponds in the UK have been identified as priority habitats.

Identifying Priority Ponds

Identifying and reporting new priority ponds helps to protect these sites and increases the likelihood that their freshwater species will continue to thrive in the landscape. Information about priority ponds is valuable to many public bodies, organisations and individuals.

Ponds can qualify as priority ponds based on any one (or more) of the five criteria listed here:

- Habitats of high conservation importance
- Ponds with species of high conservation importance
- Ponds with exceptional populations or numbers of key species
- Ponds of high ecological quality
- Other important ponds (eg. pingos or dune slack ponds)

These five original criteria for identifying priority ponds require expert knowledge of the species present in a pond. This creates a barrier to the widespread identification of priority ponds.

To reduce the obstacles to identifying priority ponds, we've developed two additional methods for predicting the likely occurrence of priority ponds in association with Natural England.

- The PASS survey and
- Clean Water - assessed using two nutrients which can pose a major risk to freshwater wildlife: nitrate and phosphate.

The PASS Method

PASS uses observations about the physical characteristics of a pond to rapidly identify if a pond is likely to qualify as a priority pond.

Using these variables, the algorithm is expected to correctly predict 58% of priority ponds.

PASS errs on the side of caution. Although the algorithm will miss around 42% of waterbodies that would classify as priority ponds using biological measures, it should make few errors by falsely identifying a non-priority pond as a priority pond. The low level of false positives is important to ensure that when the algorithm predicts that a pond has priority status, this prediction is highly credible.

A negative result does not mean the pond definitely does not have priority status, but that further biological assessments need to be carried out to assess whether it is a priority pond.

Variables recorded:

- Grid reference
- Shade
- Inflow
- Isolation
- Plant cover
- Grazing
- Surrounding land use



When to survey

PASS can be used to assess ponds in England and Wales, using survey data collected during the period from early Summer (mid June) through to early Autumn (early October), i.e. the period when most wetland plants are visible in ponds.

Before you go out

- Make sure that you have the land owners permission to carry out a PASS survey. See our website for advice and resources regarding landowner permissions.
- Read the health and safety and biosecurity information on our website.
- Complete the elements of the survey that can be done remotely, such as grid reference and 0-100m land use.

Completing a PASS survey

The PASS survey should only be done at ponds where you have permission from the landowner.

Note: this survey is not intended for garden ponds.

All data should be entered into the PASS web form on our website. Clicking submit will give you an instant result for your pond.

You can print off the PASS field sheet to take out with you or you can enter results directly into the survey web form in the field using your smart phone.

PASS web form and printable field sheet:

<https://freshwaterhabitats.org.uk/advice-resources/survey-methods-hub/priority-pond-survey/>

It is useful to take a photo of the pond to refer back to.

Defining the pond boundary

Identifying the 'outer edge' of the pond is important for calculating many of the survey metrics.

In all cases, the definition of pond 'outer edge' is 'the upper level at which water stands when the pond is full' i.e. water levels are at their highest (excluding flooding events after heavy rainfall). Normally this is the level at which water sits in late winter or early spring, so when you visit a pond in summer, the water level will usually be lower than the outer boundary, and you will need to determine where it lies.

Clues to finding the maximum water level include

- A change in vegetation; this is a distinct transition from wetland to terrestrial species (sometimes marked by fringe of rushes).
- A break in slope
- Discoloration marks on rocks or trees.
- Bundles of fine roots growing out from willow and alder trunks are another clue, because these usually only develop below the winter water level.
- Ponds with outflows usually have less variation in water level than other ponds, because the outflow controls the maximum water level. Discoloration marks on an outflow pipe or the stones at the edge of an outflow stream can be good places to find the upper water line.



Grid reference

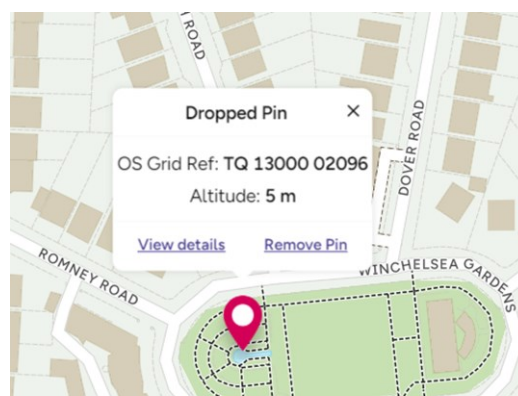
The pond's grid reference should be located in the middle of your chosen pond. It should be at least 8 figures e.g. SJ 7498 8112, to ensure that the pond can be accurately identified.

The pond's grid reference can be found from a range of sources:

- By hand, using an Ordnance Survey map.
- On site, using a mobile phone app such as OS locate.

Note that you may be standing some distance from the pond when you take this grid reference, so it should be adjusted later to ensure it marks the correct location of the pond.

- On-line, using a website such as <https://explore.osmaps.com/> or UK Grid Reference Finder at www.gridreferencefinder.com (right click the map to get grid reference).



Getting a grid reference from
<https://explore.osmaps.com/>

When completing the online form, if you don't already know the grid reference, you can locate your pond on the interactive map. If you then click on your pond this will automatically fill in the grid reference field on the form.

Pond name

This box provides a quick way for you to identify your pond; particularly helpful if you are surveying a number of sites. You can add a pre-existing name (e.g. a locally used name or the name given on an OS map – as seen on the map here), or create your own pond name. Try to make this name memorable, avoid only using a number e.g. Pond 1, since, if you identify a priority pond and later record it on the priority pond map, there could be many of these in the database. If you do want to use a number, combine it with the name of the site, e.g. Pond 1 Black Park.

Inflows

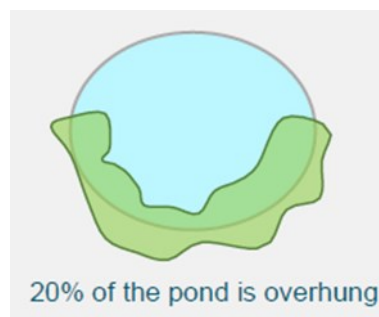
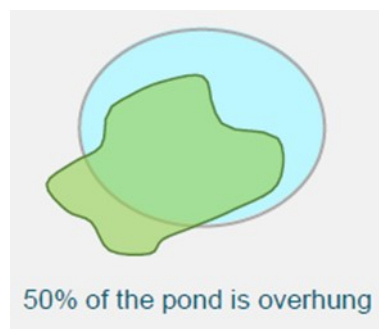
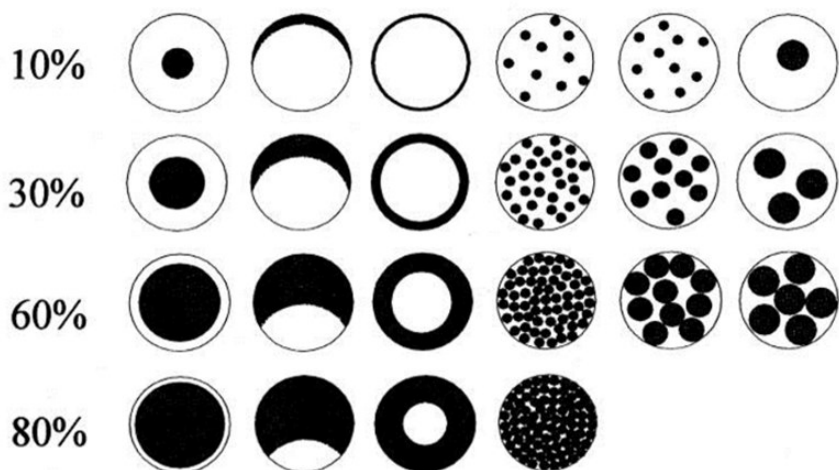
This includes inflow streams, ditches, springs or wet seepage that drains into the pond. It can also include large drainage pipes.

Include an inflow as present, even if ditches or streams happen to be dry at the time of your survey.

Overhanging trees and shrubs

This is an estimate of how much of the pond is *directly* overhung by trees and shrubs, i.e. the proportion of the pond that would be shaded if the sun was directly overhead.

The estimate is made as a percentage of the whole pond area (i.e. the maximum winter water level, not the current water area). The estimate can include tall shrubs and brambles, but does *not* include shading from emergent pond plants, like Bulrush.



This visual guide is included on our PASS form to help you estimate percentage cover.

Percentage of aquatic and wetland vegetation cover

This is an estimate of the percentage of the pond area that is covered by wetland vegetation.

This includes:

- Submerged plants growing in the water (like pondweeds).
- Emergent wetland plants like Bulrush, Soft Rush, sedges, and lower growing plants like Water Mint and wetland grasses like Sweet-grass and Creeping Bent.
- Floating-leaved plants like Waterlily

The estimate DOES NOT include areas covered by filamentous algae as well as duckweed and the alien Water Fern (*Azolla* species), both of which are tiny free-floating leaved plants.

They are excluded because these species are generally indicative of poorer ponds. If, as in the photo here, there is other vegetation growing underneath the floating carpet of duckweed, that vegetation can be counted.



Pond surface covered with duckweed.



Water fern.

Grazing intensity

Grazing intensity refers to the extent of grazing and trampling (poaching) by livestock e.g. cattle, sheep, horses that have access to the pond. It can include grazing by other hooved animals e.g. wild deer, but it *excludes*, rabbits, grazing by ducks and geese or other disturbance, for example by people or dogs.

If grazing animals are not currently visible, use indirect evidence such as: grazed grassland vegetation at the pond edge, signs of hoof poaching and trampling in pond mud, or the presence of animal dung in the pond or surrounds.



If the pond is fenced off so that only *parts* of the pond banks are accessible to animals, please average out the grazing intensity across/over the whole pond.

It is possible to use intermediate values (e.g. 3.5), for landscapes that fall between the grazing categories given.

Score	Grazing levels
0	No grazing
1	Infrequent or low intensity grazing, for example, ponds that can be accessed by animals, but the surrounding grassland is tall and shows few signs of grazing
2	Clear evidence of grazing, and probably poaching, on the pond banks and margins, but not sufficient to create extensive areas of bare ground in these areas (<5%)
3	Ponds that have short-grazed vegetation on the pond banks and/or significant evidence of hoof poaching with 0% to 20% of the margins exposed as trampled mud.
4	Pond banks and margins heavily grazed and poached so that between 20% and 90% of the pond banks and margins are bare poached mud
5	Pond margins so heavily poached and grazed that they are almost bare of vegetation (i.e pond margins are at least 90% mud).

Table describing the grazing levels.



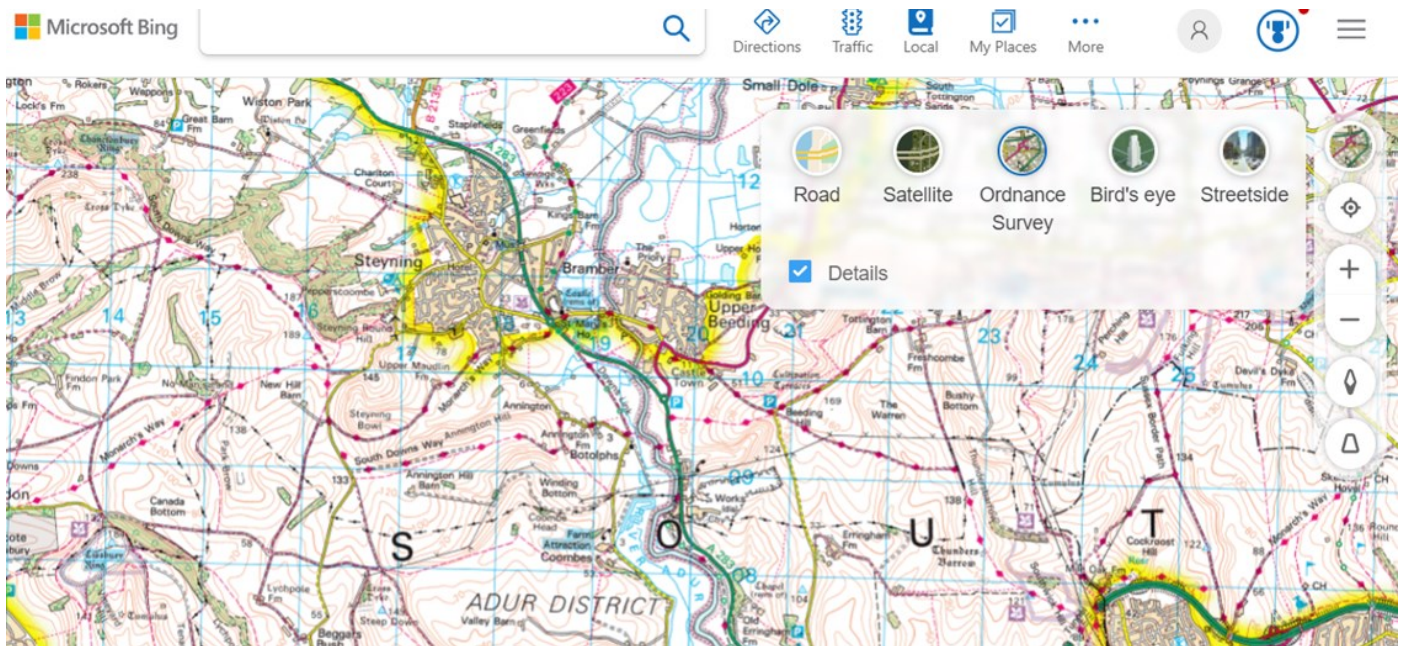
The pond in this photo would score 4 for grazing intensity. As the pond margin is heavily grazed but some vegetation remains.

Isolation

Isolation refers to the extent to which the pond is isolated from other waterbodies and wetlands. Waterbodies to consider include ponds, lakes, rivers, streams and ditches. Wetlands include a wide range of waterlogged habitats from marsh, fen and bog to wet heath and wet woodland. Consideration should be given to the presence of historic wetlands (e.g. the Thames Valley, and arable fenland), which may be degraded but still retain strong elements of their freshwater heritage.

Isolation is scored on a 0 - 5 point scale, where 0 is a pond that is highly isolated, and 5 is a pond located in middle of major wetland. You can use intermediate values (e.g. 3.5), for landscapes that fall between the categories given.

Assessments should preferably be made using a 1:25,000 scale map, and can be supplemented by local observations. You can view Ordnance Survey maps for free on Bing www.bing.com/maps.



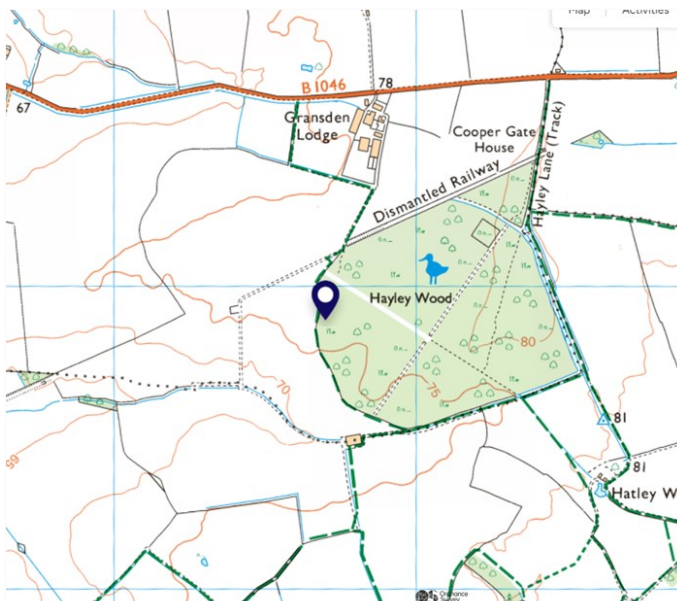
Bing maps. Click the map icon in the top right and select Ordnance Survey. Note: this option isn't available on mobile phones.

Score	Isolation levels
0	The pond is highly isolated: lying in an area with virtually no waterbodies or wetland areas for 2-3 kilometres e.g. some areas of chalk downland.
1	There are few waterbodies or wetlands within approximately 1 km e.g. arable areas with small ditches but few ponds or streams.
2	The surrounding landscape has scattered waterbodies e.g. occasional ponds and/or streams within approximately 1 km of the pond.
3	The surrounding landscape has many waterbodies e.g. 12+ small ponds, and/or many small streams, rivers or areas of wetland within approximately 1 km of the pond. This category includes
4	Either: (a) waterbodies and/or wetlands cover an extensive area within 0.5 km of the pond, or (b) the pond is located in a traditional wetland area with many waterbodies e.g. Somerset Levels.
5	Pond is completely surrounded by extensive areas of waterbodies or wetland areas e.g. located within a peat bog or fen.

Table giving descriptions for each isolation level.

Isolation score examples:

Score 2



Scattered waterbodies within 1km of the pond.

Score 5



This pond is located within a fen.

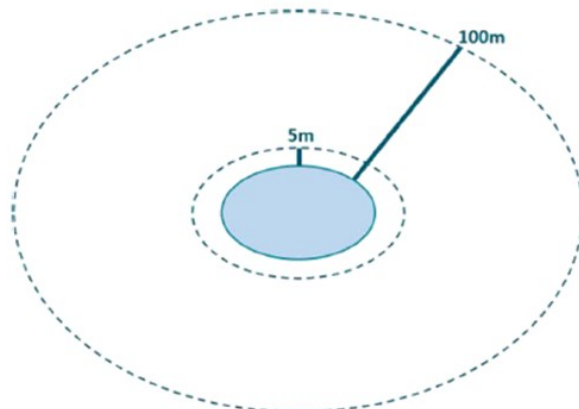
The marker in the centre of the map shows the location of the pond being assessed. In the example on the left the pond has scored a 2 for isolation as there are some scattered waterbodies within 1km of the pond. The pond in the right hand example scores a 5 as it is located in a wetland area and is surrounded by many waterbodies.

Surrounding land use

The percentage of different land use is recorded in two distance zones from the edge of the pond. In both cases 'edge of the pond' refers to the winter water line

The 0-5 meters zone is usually a record of the vegetation on the upper pond banks. Note that the 0-100 m zone also includes this bank area.

The 0-5 meter zone is easily defined by pacing (a single pace is generally around 1m). It is often easier to use the 1km squares on an OS map to estimate the distance: 100m is 1/10th of 1km.



The table on the next page shows the land use types we are recording and provides a description for each.

The list does not include ALL land use types – for example buildings and roads are not included – but just those necessary for the PASS survey. Therefore, in many cases the columns will not total 100%. Just record a percentage amount for any of the land use types listed that are present, and where the land use type is not present within 100m put a zero in the box, or leave blank.

Note that conifer woodland is a separate category from trees, woodland and scrub.

For most people, a combination of map (including satellite image) and field evidence works best to calculate both distance and land-use percentage. Field assessment of grassland type is particularly helpful because this is often hard to identify from map and satellite images alone.

Land use type	0-5m %	0-100m %	Examples
Trees, woodland & scrub			Deciduous woodland, individual trees, scrub and hedgerows (exclude coniferous woodland and commercial orchards)
Heath & moorland			Lowland and upland heath and moorland; includes bracken
Rank vegetation			Unmanaged grass, neglected and abandoned land, set-aside, verges and buffer strips.
Unimproved grassland			Herb-rich, calcareous and acid grassland (good quality plant indicators usually present). Low percentage of agricultural grasses. Not fertilised, little or no drainage.
Semi-improved grassland			A transition category. Grasslands modified by fertilisers, drainage, herbicides or intensive grazing, but retaining elements of natural
Ponds & lakes			Permanent and seasonal standing waterbodies
Other semi-natural			E.g. maritime vegetation, saltmarsh, sand-dune, cliffs, rock-outcrops, gravel-pits, quarries, areas of sand, gravel or stone, river, stream,
Conifer woodland			Coniferous woodland
Arable			All crops (except grass). Includes flower, vegetable and soft fruit crops and ploughed or fallow arable land

Table showing the land use types we are recording for PASS.

For the 0-5m distance zone we are only recording the percentage of trees, woodland and scrub, heath and moorland, ponds and lakes and arable land. The greyed-out boxes on the form indicate information that is not required.

Example

Ordnance Survey map 1:25,000



Satellite image



Land use type	0-100m %
Trees, woodland & scrub	10
Heath & moorland	
Rank vegetation	
Unimproved grassland	
Semi-improved grassland	70
Ponds & lakes	
Other semi-natural	15
Conifer woodland	
Arable	

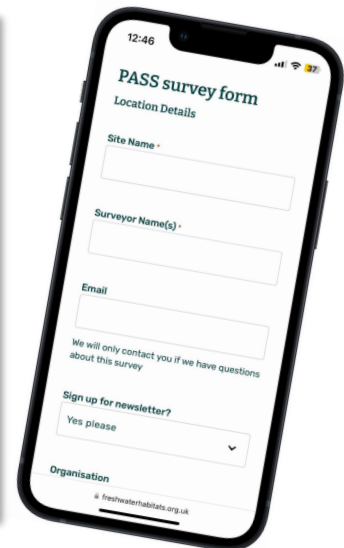
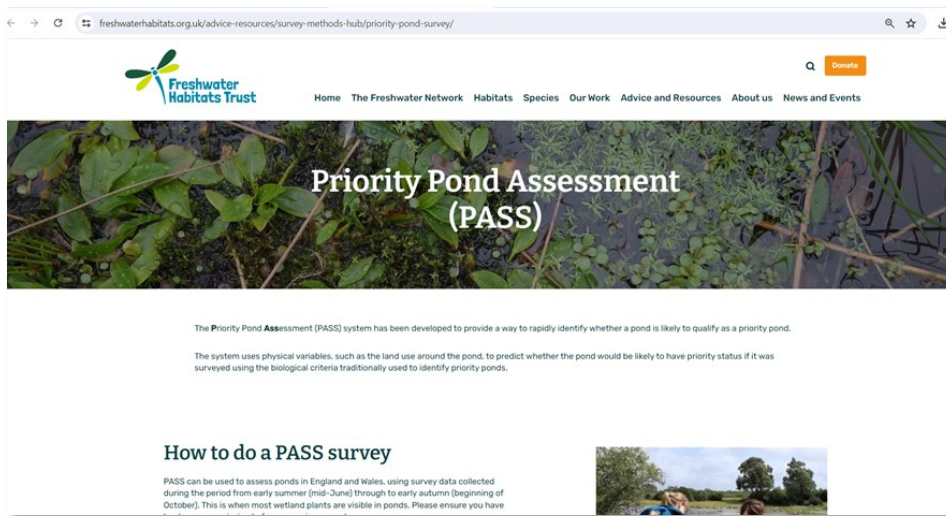
The river is recorded in the "other semi-natural" category



Calculating your result

Once you've gathered your environmental data, please enter them into the Freshwater Habitat Trust PASS web form to calculate whether the pond qualifies as a priority pond. You will receive an instant result for your survey.

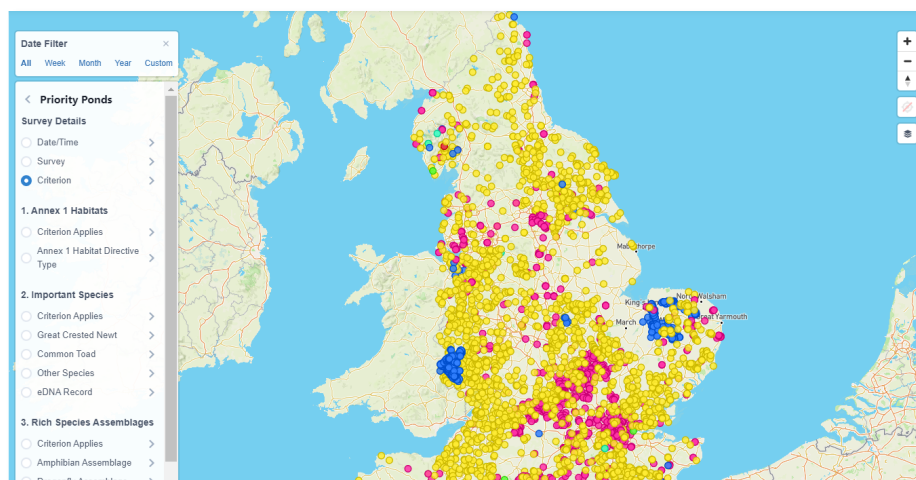
<https://freshwaterhabitats.org.uk/advice-resources/survey-methods-hub/priority-pond-survey/>



Positive results

If your pond is a Priority Pond - Congratulations! Your data will be added to the Priority Ponds database. This may take a couple of weeks. The Priority Ponds map can be viewed here:

<https://freshwaterhabitats.org.uk/waternet/priority-ponds/>



Negative results

If your pond is not predicted to be a Priority Pond, remember:

This prediction is not conclusive. PASS will miss around 40% of Priority Ponds. Undertaking more detailed biological surveys, using priority pond criteria, will provide a more conclusive answer.

Priority ponds are a scarce resource, that's what makes them so special. The majority of ponds surveyed using PASS will not be priority ponds. However, surveying a large number of ponds increases the likelihood that we will find those ponds that are priority habitat.