



Priority Habitats Field Guide

This field guide will help you to remember the methods and specific features you learned about in your training, during your field assessment. You can print this out and take it with you, or download the PDF on your phone/tablet device. Remember to consider your **confidence level** (High, Moderate, Low) too!

For further resources, please visit:
<https://priorityhabitats.org/>



**FRESHWATER
BIOLOGICAL
ASSOCIATION**



Assessing River and Stream Naturalness

Physical - here, we want to assess the physical naturalness of the river or stream. This part of the assessment asks you to look for **artificial modifications**, **tree cover and variety of vegetation** on the banks, as well as note any changes that have been made to the river .

Scoring

1**Highly natural**

- No evidence of physical modifications,
- At least 30% of surveyed area has tree cover, tree roots strongly interact with the channel, affecting flow, Patterns of erosion and deposition.
- Leaf litter/woody material left in channel.
- Riparian zone (5m from bank) with semi-natural and variety of vegetation.

2**Natural**

- Some limited evidence of physical modifications, no more than 5%.
- At least 30% of surveyed area has tree cover, tree roots interact with the channel to some extent, Patterns of erosion and deposition.
- Leaf litter/woody material left in channel.
- Riparian zone with semi-natural vegetation.

3**Semi-natural**

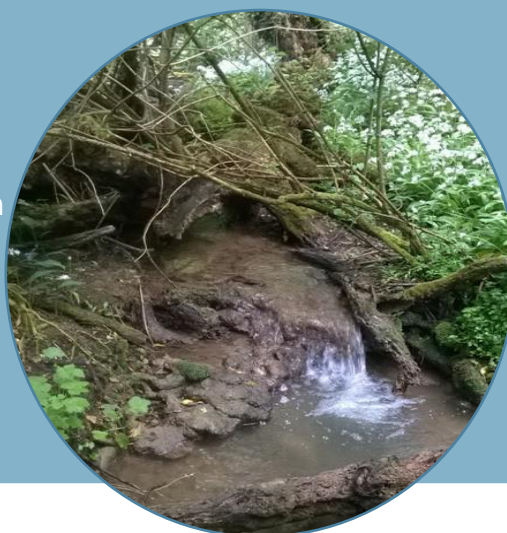
- Some evidence of physical modifications (up to 30% of survey area), Artificial impounding structures present but rare with limited impact on physical habitat and movement of species.
- Less than 30% tree cover.
- Riparian zone not semi-natural e.g. roads / tracks moderate variety of vegetation

4**Unnatural**

- Extensive physical modifications, with some natural sections along the channel/banks, more than 30%. Artificial impounding structures, e.g. dams or weirs, are present and impacting habitat.
- Less than 30% tree cover.
- Riparian zone vegetation modified e.g. heavily grazed.

5**Highly unnatural**

- Entire river is physically modified. River is straightened along length, with artificial or reinforced banks.
- Less than 30% tree cover.
- habitat features
- Riparian zone vegetation heavily cropped or simple e.g. plantation, agricultural land.



Woody material in the channel

Hydrological - here, we want to assess the hydrological naturalness of the river. This part of the assessment asks you to look at the way in which the **river flows** and whether **water is impounded or abstracted** at any point along its stretch.

Scoring

1

Highly natural

- No evidence of impacts on natural flow from abstraction, diversion, impoundment or discharges.
- Headwaters may be dry in the summer (intermittent streams).

2

Natural

- Some minor impacts on natural flow from abstraction, diversion, upstream impoundment or discharges. e.g. pipes or pumps or water diversions affecting natural flow.

3

Semi-natural

- Moderate impact of abstraction, diversion, upstream impoundment or discharges on natural flow. e.g. weirs or dams creating artificial lakes.

4

Unnatural

- Natural flow is heavily impacted by hydrological changes. Unnatural drying.

5

Highly unnatural

- The river is dry for the majority of the year due to abstraction, impoundment or diversion of water.



Weir impounding structure

Remember! if you are unsure about your assessment, you can just lower the confidence rating you give!

Chemical - here, we want to assess the chemical naturalness of the river. This part of the assessment asks you to look out for the presence of **algal blooms**, **sewage fungus** and other evidence of **effluent discharge**.

Scoring

1

Highly natural

- No evidence of pollution,
- No sewage fungus or filamentous algae, no direct effluent discharge.
- No evidence of artificially enhanced input of fine sediment - good water clarity

2

Natural

- Evidence of low-level pollution.
- Small amounts of fungus and patches of filamentous algae. Potential effluent discharge upstream.
- Low-level evidence enhanced input of sediment

3

Semi-natural

- Moderate levels of fungus and filamentous algae growth along the entire reach. Moderate evidence of enhanced sediment.

4

Unnatural

- High levels of fungus and filamentous algae growing along the entire reach.
- High levels of sediment.

5

Highly unnatural

- Major pollution issues, with thick mats of filamentous algae and extensive sewage fungus growth,
- Chronically poor water clarity. Major levels of sediment.
- Lack of invertebrates or dead aquatic animals.



Sewage fungus sign of effluent discharge

Water quality **test kits** can be used to indicate nutrient level and chemical make up of the river.

Biological - here, we want to assess the biological naturalness of the river. This part of the assessment asks you to make note of the presence of **non-native species** in and around the watercourse.

Scoring

1

Highly natural

- No evidence of non-native species present (assess for Himalayan balsam, Giant hogweed and Japanese knotweed as a minimum).

2

Natural

- One or more non-native species present but not extensive,
- Non-native plants take up 5% or less of channel length,
- Non-native animals should be only rarely encountered.

3

Semi-natural

- One or more non-native species present, with a significant presence along the reach (up to 25%)

4

Unnatural

- One or more non-native species are a major component of plant and/or animal life in and around the river (up to 60%)

5

Highly unnatural

- One or more non-native species dominate the plant and/or animal life in and around the river.



Giant hogweed



iNaturalist



PlantNet



Seek

**Don't
forget
your
apps!**

Assessing Lake Naturalness

Physical - here, we want to assess the physical naturalness of the lake. This part of the assessment asks you to consider the condition of the shoreline, the land use around the lake, and the shape of the lake (if artificial).

Use these categories (shoreline, land use, lake shape) to help you decide on the naturalness class of your lake. Whichever is the lowest score you give for a category, use that as the overall class e.g. if you gave shoreline a 2 but land use a 1, the overall class should be 2! Please note: lake shape is only used for artificial lakes.

Scoring

| | Shoreline | Land use | Lake shape |
|----------|--|---|---|
| 1 | <ul style="list-style-type: none"> No evidence of physical modification, | <ul style="list-style-type: none"> Land use around lake all semi-natural. | <ul style="list-style-type: none"> Lake edges slopes gently, allowing for plants to grow in the water. |
| 2 | <ul style="list-style-type: none"> Fringing wetland. | | |
| | <ul style="list-style-type: none"> No more than 5% of shoreline physically modified. | <ul style="list-style-type: none"> Majority of land use around lake is semi natural. | <ul style="list-style-type: none"> Plant growth possible up to 10m from lake edge. |
| 3 | <ul style="list-style-type: none"> Fringing wetland. | | |
| | <ul style="list-style-type: none"> No more than 1/3 of shoreline physically modified. | <ul style="list-style-type: none"> Around 2/3 of land use around lake is semi-natural. | <ul style="list-style-type: none"> Plant growth possible up to 3m from, lake edge. |
| 4 | <ul style="list-style-type: none"> Little wetland. | | |
| | <ul style="list-style-type: none"> Physical modifications across at least 2/3rds of shore. | <ul style="list-style-type: none"> At least 1/3rd of the land use around the lake is semi-natural. | <ul style="list-style-type: none"> Edges may be steep, leaving little habitat for plants. |
| 5 | <ul style="list-style-type: none"> Physical modifications across more than 2/3rds of shore. Wetland absent | <ul style="list-style-type: none"> Less than 1/3 of land use is semi-natural. | <ul style="list-style-type: none"> Artificial edges leave little habitat for plants. May be some marginal or floating. |



Shoreline modification



Fringing wetland

Hydrological - here, we want to assess the hydrological naturalness of the lake. This part of the assessment asks you to note features such as water level, the presence of structures, as well as inflows and outflows.

As with physical naturalness, use the lowest score you give for a sub-category as the overall class e.g. if a lake scores 2 on in/outflows but 3 on water level, you should give it an overall score of 3.

Scoring

| | Structures | Water level | In/outflows |
|----------|---|---|---|
| 1 | No structures affecting water level/creating barriers. | • Natural, seasonal water level fluctuations. | • In/outflows natural, surrounding land not drained or with ditches. |
| 2 | Structures may be present, but are not unpassable to fish. | • Natural water level fluctuations, or, artificial mimicking natural pattern. | • No additional ditches, but may be some modifications to in/outflows. |
| 3 | Structure is present that is impassable to most fish species, most of the time. | • Water levels are fixed, unable to fluctuate naturally. | • Outflows modified, or, artificial inflows from land draining (ditches). |
| 4 | Large structure present, impassable at all times to all fish species. | • Water levels heavily depleted by abstraction. | • Outflows modified, artificial inflows (if any). |
| 5 | Very large, impassable structures present. | • Drawdown of more than 2m of water annually. | • Lake likely to be a reservoir or part of hydroelectric scheme. |



River Obstacles

You can report obstacles found on a lake using this app.

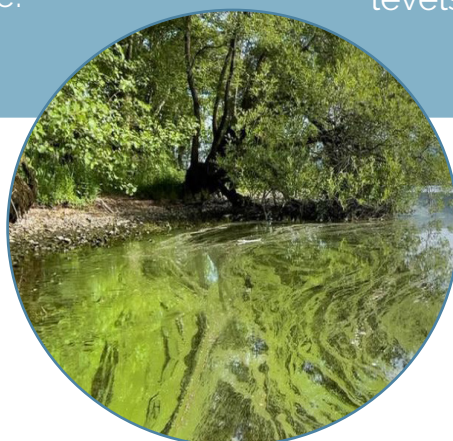


Aquatic plants stranded

Chemical - here, we want to assess the chemical naturalness of the river. This part of the assessment asks you to look at **algal growth**, **water quality**, and **plants**. You may also wish to apply sampling methods such as **water sampling** and **biological monitoring**. You may use one or all methods to decide a chemical naturalness. Tick all that you use on your assessment form.

Scoring

| | Water clarity | Algae | Plants | Sampling |
|---|---|---|---|---|
| 1 | <ul style="list-style-type: none"> Lake bottom or Secchi disc visible through more than 3m of water. | <ul style="list-style-type: none"> Very little algae, hardly noticeable. | <ul style="list-style-type: none"> Plants growing at 3m depth or as deep as the lake (if less than 3m) | <ul style="list-style-type: none"> Water tests show no positive result, biological sampling show no pollution. |
| 2 | <ul style="list-style-type: none"> Lake bottom or Secchi disc visible through between 1m and 3m of water. | <ul style="list-style-type: none"> Occasional noticeable algae growth, not persistent or widespread. | <ul style="list-style-type: none"> Plants growing at less than 3m depth, but more than 1m depth. | <ul style="list-style-type: none"> Water tests register low pollution. Bio-sampling shows low level pollution. |
| 3 | <ul style="list-style-type: none"> Lake bottom or Secchi disc visible through 50cm to 1m of water. | <ul style="list-style-type: none"> Moderate filamentous algae, with algal blooms in spring and autumn. | <ul style="list-style-type: none"> Some plants present but not abundant unless adapted to nutrients. | <ul style="list-style-type: none"> Water tests show moderate pollution. Bio-samples represent moderate water quality. |
| 4 | <ul style="list-style-type: none"> Lake bottom or Secchi disc visible through 25cm to 50cm of water. | <ul style="list-style-type: none"> May be frequent blooms and extensive filamentous algae. | <ul style="list-style-type: none"> Plants absent or sparse, | <ul style="list-style-type: none"> Water tests register high pollution. Bio-samples represent highly impacted water quality. |
| 5 | <ul style="list-style-type: none"> Water brown or green, unable to see bottom of lake under 25cm of water. | <ul style="list-style-type: none"> Frequent algal blooms and extensive filamentous algae. | <ul style="list-style-type: none"> No submerged plants are present. | <ul style="list-style-type: none"> Water tests and biological sampling represent very high levels of pollution. |
| | Water clarity | Algae | Plants | Sampling |



Algae bloom

Biological - here, we want to assess the biological naturalness of the lake. This part of the assessment asks you to make note of the presence of **non-native species** in and around the water.

A single biological class is needed for the assessment. If you only see plants, or only see animals, that is fine. As before, if you see both then base your class on the lowest score.

Scoring

1

Non-native plants

- No evidence of non-native species in or around the lake.

Non-native animals

- No evidence of non-native species in or around the lake.

2

- Non-native plants occupy no more than 5% of shoreline/lake area

- Non-native animals are rarely encountered, and have little impact.

3

- Non-native plants occupy up to 25% of the shoreline.

- At least one non-native species found when searched for.

4

- Non-native plants occupy up to 60% of the shoreline.

- Multiple non-native species found when searched for.

5

- Non-native plants occupy more than 60% of the shoreline.

- Non-native species are numerous and found with little effort.



Japanese knotweed



iNaturalist



PlantNet



Seek

**Don't
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Non-native species



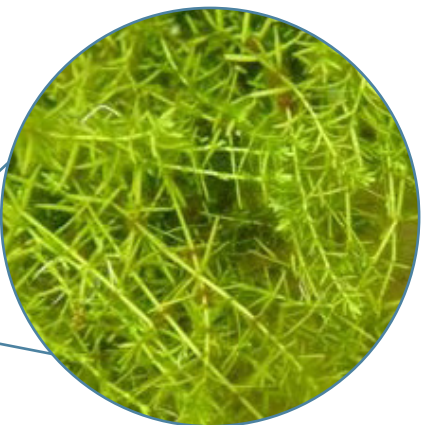
Himalayan balsam



Giant hogweed
(do not touch me!)



Japanese knotweed



New Zealand pygmyweed

Non-native species



Parrot's feather



© NNSS

Images © GB Non-Native Species Secretariat



Signal crayfish
(look for my red claws)



Images © Environment Agency



Killer shrimp



Image © Paul Beckwith BWV



Zebra mussel

Image © Anastasija Zaiko

Non-native species



Images © GB Non-Native Species Secretariat



Curly Waterweed



Images © Habitats.org.uk & Biodiversityireland.ie



Water Fern

Remember! You can see a list of the non-native species we are interested in on your assessment form.

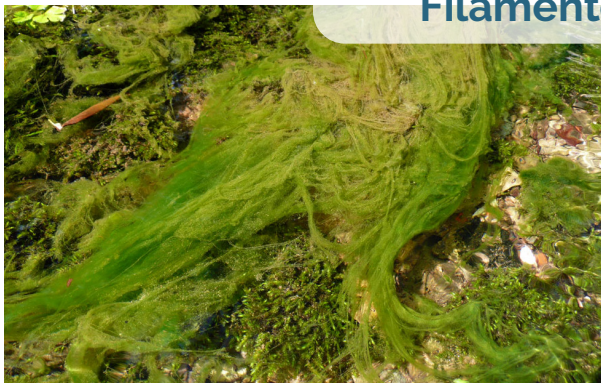
Plant functional groups

Rosette forming



Plants have **short, stiff leaves with pointed ends**. The leaves **join at the base** in a rosette e.g. shoreweed and water lobelia.

Filamentous algae



Algae that **grow in threads** that interweave. This forms a mat that **looks like wet wool**. May be attached to substrate or free-floating.

Floating leaved and rooted



Leaves **lie flat on the water** surface but are rooted to lake bed e.g. water lily and floating bur reed.

Free floating



Plants are not rooted, but lay on the surface of the water e.g. duck weed.

Submerged linear leaves



Grass-like leaves, mostly submerged underwater, and rooted to the lake bed e.g. horned pondweed.

Submerged broad leaves



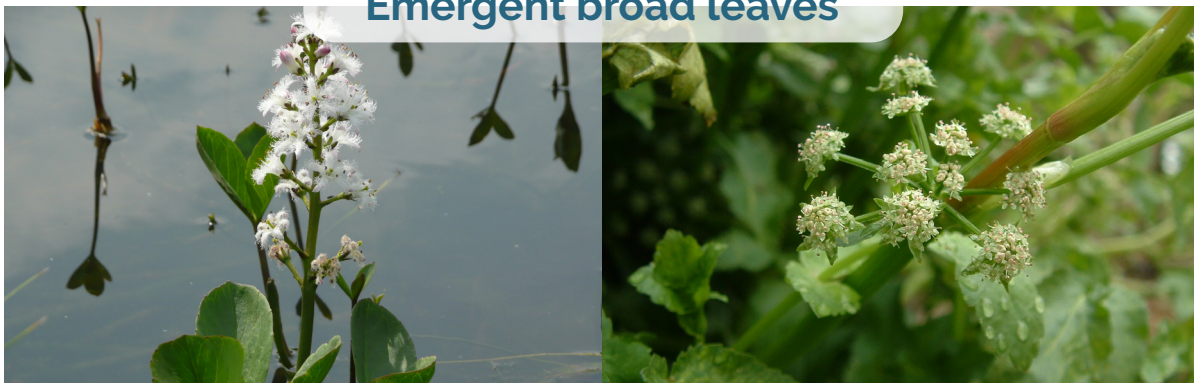
Broad leaves, mostly submerged underwater, and rooted to the lake bed
e.g. waterweed and clasp-leaved pondweed.

Submerged fine leaves



Very **fine, branched 'leaves'**, mostly submerged underwater, and rooted to the lake bed e.g. stoneworts and water milfoils.

Emergent broad leaves



Broad leaf plants rooted to the lake bed, with **flowers and leaves above water** e.g. bog bean and fool's watercress.

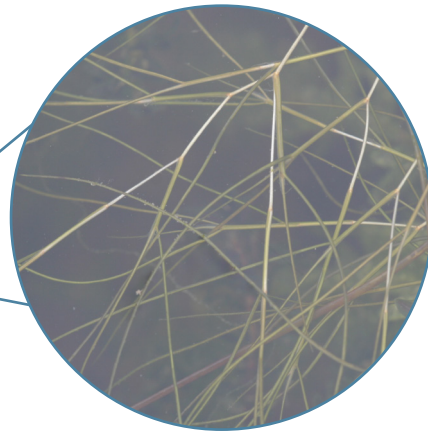
Emergent narrow leaves



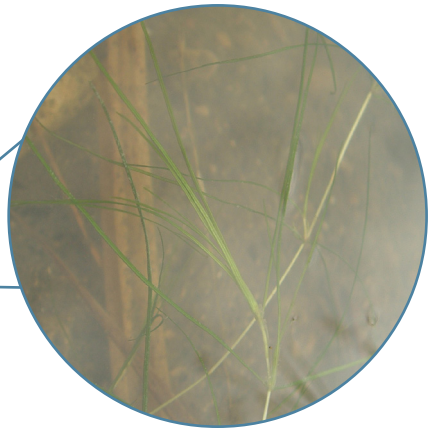
Narrow leaf plants rooted to the lake bed, with **flowers and leaves above water** e.g. reeds and horsetails.

Nutrient enrichment

These plants can be indicators of nutrient enrichment in still water bodies.



Fennel pondweed



Horned pondweed

Helpful resources



<http://priorityhabitats.org/training-resources/>



<http://www.nonnativespecies.org/home/index.cfm>



<http://publications.naturalengland.org.uk/publication/5630174502584320>

<http://publications.naturalengland.org.uk/publication/6266338867675136>

River & streams

Remember to take note (if you can) of any of these key habitat features on your river or stream stretch.

- **Bankside flushes and springs** - areas where ground water is seeping into the system.
- **Trees interacting with channel** - trees along the river bank extending their roots or branches into the channel.
- **Waterfalls and cascades** - often form in the upper reaches of streams, where the gradient of the land is changing more steeply.
- **Woody material** - Discarded woody material such as fallen branches or trunks often make their way into undisturbed channels.
- **Natural mire-stream transitions** - these occur where the wetland and stream are connected to each other.
- **Sinuuous and multiple channels** - meandering stretches of river, as well as rivers that have split into several distinct channels.
- **Riparian wetlands** - wetlands (bogs/mires/marshes) which form on the land immediately adjacent to the river or stream channel.
- **Exposed cobble/gravel/sand** - naturally deposited sediments from high or low flow events.
- **Moss-covered boulders** - these provide extra complexity to the river habitat.
- **Fern-filled ravines/gyhlls** - well developed fern vegetation along steeper sided river banks.

Lakes

Remember to take note (if you can) of any of these key habitat features on your lake:

- **Shoreline modification** - this includes any changes to the shoreline such as reinforcing the banks or adding artificial structures.
- **Riparian zone up to 10m from bank** - the area around the lake and semi-natural habitat.
- **Perimeter trees** - note of the percentage of lake perimeter that has trees.
- **Fringing marginal emergent vegetation** - note the percentage of the lake perimeter that has emergent vegetation.
- **Number of ditches** - ditches may drain into the lake from the land surrounding, you may see these as you walk around, or on aerial maps.
- **Presence of outflow structures** - can include sluices, weirs or dams.
- **Plant functional groups** - keep an eye out for: rosette forming, floating leaved and rooted, free floating, submerged linear leaves, submerged broad leaves, submerged fine leaves, emergent broad leaves, emergent narrow leaves and filamentous algae.

GLOSSARY

This glossary is comprised of words for which surveyors have asked for.

Abstraction- artificially removing water from natural freshwater sources such as groundwater, rivers, streams and lakes for various human uses.

Algae- a simple, non-flowering and typically aquatic plant of a large group that in freshwater includes many different filamentous (stringy) and single-celled forms. Some species attach themselves to stones or plants whilst others live freely in the water. They come in many different colours, forms and sizes.

Biodiversity- the natural variety of plant and animal life in a particular geographic location. It includes genetic variation within species, the variety of species and the variety of habitats and ecosystems.

Biological- relating to biology or living organisms.

Biosecurity- in terms of nature conservation this means procedures or measures designed to protect the wildlife against non-native species or diseases..

Citizen science- the practice of public participation and collaboration in scientific research to increase scientific knowledge. Through citizen science, people share and contribute to data monitoring and collection programs.

Conservation- in the context of this initiative, protection or restoration of wildlife, habitats, ecosystems and associated natural resources to prevent damage, destruction, or neglect and promote a healthy and vibrant natural environment.

Deposition- In the context of this initiative, the settlement of material on the bed of rivers, streams, lakes or ponds. Of particular concern is the excessive deposition of fine sediment from artificially enhanced erosion of soil and channel banks in the catchment, as well as physical modifications to river and stream channels that reduce the transport of fine sediment downstream.

Discharge – In the context of rivers and streams the total volume of water transported through the channel in a given time, . This includes any suspended solids (sediment), dissolved chemicals, or biological material (e.g. diatoms) in addition to the water itself.

Ditch - a straight channel dug for land drainage purposes. Natural headwater streams may be channelised and take on the appearance of a ditch. Natural stream channels can also be artificially extended into natural wetlands to drain the land for agricultural or forestry purposes

Effluents- sewage or other liquid waste discharged into a river, stream, lake or the sea.

Erosion- the wearing away of materials by water or wind. On land this relates to the erosion of rocks and soils, much of which is deposited as sediment (mud, silt, sand, gravel, pebbles, cobbles) in rivers, streams, lakes and ultimately coastal waters, These sediments are then themselves eroded and re-deposited within freshwater and coastal habitats. .

Ghyll- a small deep ravine, especially a wooded one, in headwater stream systems.

Hydro-electric scheme- an installation that generates electricity from turbines that convert the potential energy of falling or fast-flowing water into mechanical energy.

Hydrology- the study of the properties and behaviour of water e.g. flow.

Impounding structure- a man-made installation used to retain or store water in river and stream systems or store artificially enhanced amounts of water in natural lakes.. They transform river and stream sections into lake-like environments which 'drown out' in-channel habitat mosaics and artificially increase fine sediment deposition. They also artificially stabilise water levels in river, stream and lake margins, creating impacts on the plants and animals that naturally inhabit these areas.

Inflow - water entering a river, stream, lake, pond, wetland or other habitat..

International Convention on Biodiversity- the international legal instrument for 'the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilisation of genetic resources'. It has been ratified by 196 nations including the UK.

Intermittent flow- water flow in streams and sometimes rivers that is only present at certain times, signified by drying of the channel. It is a natural phenomenon, particularly in headwater streams where natural water supply from the catchment is insufficient to sustain flows all year round. Intermittent flow can also be artificially created by abstraction, water diversion, and land drainage.

Lake- a body standing water of over 2 hectares in surface area. Lakes may be a natural feature of the catchment or may be generated by impounding structures or the excavation of soils and rock.

Marginal fringing wetland- Wetland habitats that occur on the fringes of river, streams and lakes.

Mire-stream transition zone- naturally swampy or boggy ground in headwater areas and valley sides within which very small hydrological pathways form and erodes small channels (rivulets, runnels) that join together to form a natural stream channel. Trees, fallen wood and bed rock obstruct the flow of water and create dynamic complexity within the transition zone. These areas are typically drained for agriculture or forestry.

Morphology- the physical form, shape or structure of something, in this case of rivers, streams and lakes.

Non-native species- an organism that is not indigenous or native to a particular area. Some of these species are particularly invasive and cause major disruption to natural ecosystems.

Organism- an individual animal, plant or single-celled life form.

Outflow- the location where water leaves a lake or pond or the downstream end of a river system.

Priority Habitat- cover a wide range of semi-natural habitat types that were identified where action to protect and restore biodiversity is a priority.

Reservoir- a large natural or artificial lake used as a source of water supply.

Restoration- the action of returning something to its former condition.

River- a large natural stream of water flowing in a channel to the sea, a lake or another river.

Ravine- a deep, narrow gorge with steep sides.

Riparian zone- the land/wetland adjacent to rivers and streams.

Secchi disk- an opaque disc, typically white, used to gauge the transparency of water by measuring the depth, known as the Secchi depth- at the which disc ceases to be visible from the surface.

Semi-natural- modified by human influence but retaining many natural features.

Shoreline- the line along which a large body of water meets the land.

Species- a group of living organisms consisting of similar individuals capable of exchanging genes or interbreeding.

Water diversion- the removal or transfer of surface water from its natural pathway through the catchment, either within the catchment or between catchments.

Water Framework Directive- EU and UK legislation aiming to prevent deterioration of the water environment and improve water quality by managing water in natural river basin districts, rather than by administrative boundaries.