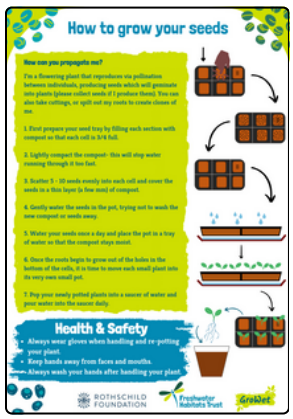
# Session 1

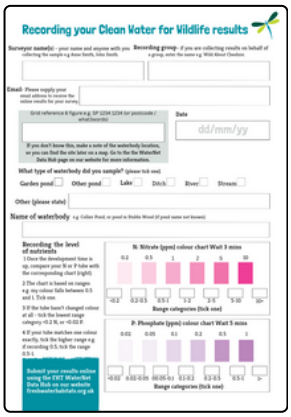
## Worksheets and Handouts

- Lesser Spearwort - Species Sheet
- Ragged Robin - Species Sheet
- Clean Water Survey
- Understanding Your Clean Water Results









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# Lesser spearwort
## Ranunculus flammula L.

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### What do I look like?
Part of the buttercup family, I have shiny yellow flowers and spear shaped leaves, which is how I got my name. I can grow up to 20-30cm height, but can also spread creeping along the ground.

### Where do I grow?
I grow as an emergent plant, sending my roots down into the seasonally wet margins of ponds, streams, water meadows and lakes.

### What do I like?
Clean unpolluted water, with low nutrient levels. Shallow margins with grazing from large herbivores that helps to disturb the ground and regulate competition from other plants.

### Why am I declining?
Poor water quality, primarily through nutrient pollution which causes some species, like algae, to grow very rapidly and smother me out. Habitat loss due to wetlands being drained, infilled and lost over the centuries.

### How can you help me?
Grow me on into a big strong plant at school. Make sure to hand me back so I can be re-introduced into the landscape, helping to improve wild populations. Please don't plant me in your garden pond. I need to be out in the wild where I can make a difference.

I live here in the wet muddy margins!

# How to grow your plant

**How can you propagate me?**

I'm a flowering plant that reproduces via pollination between individuals. I produce seeds which will germinate into plants (please collect seeds if I produce them). You can also take cuttings, or spilt out my roots to create clones of me.

1. Take your well grown adult plant and cut off some shoots, making sure you have a piece with three or four nodes on each stem (nodes are the places where the shoot meets the stem).

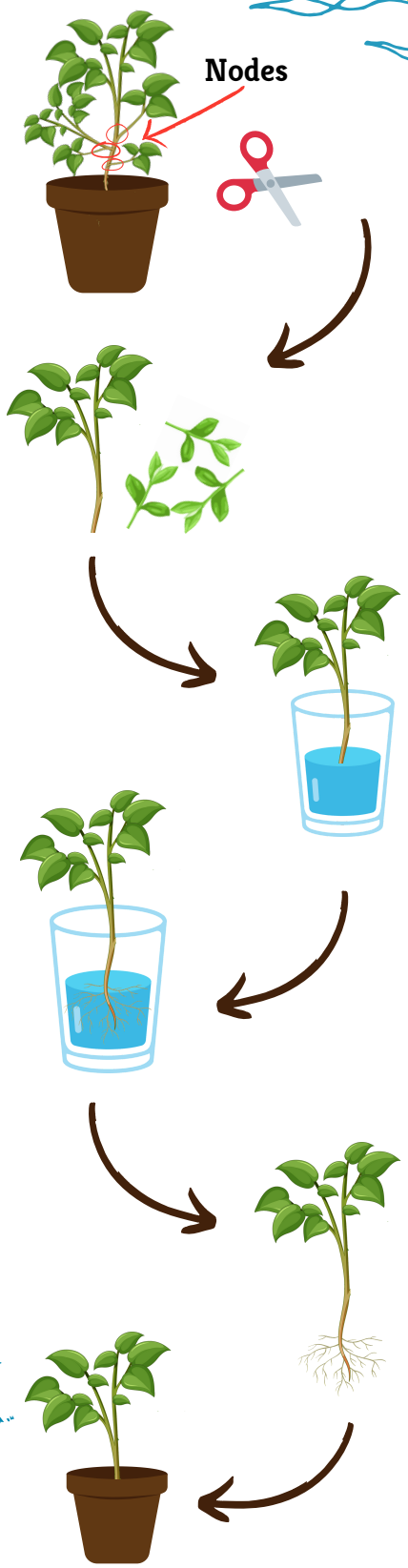
2.Place the shoots in water with the nodes submerged.

3. Roots will soon start to emerge from the nodes.

4. Wait until a healthy root system has developed, then pop your cutting into its very own pot of compost and water thoroughly.

5. Pop your newly potted plants into a saucer of water and pour water into the saucer daily to water your plant. The compost will soak up water for the roots to absorb.

It might be possible to take shoots with three or four nodes and pot them up straight away, but you would have to have the pots sunk into water so that water is at or above the soil surface. Roots form in the very wet environment!




## Health & Safety

- Always wear gloves when handling and re-potting your plant.
- Keep hands away from faces and mouths.
- Always wash your hands after handling your plant.

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# Ragged-robin

## Silene flos-cuculi (Lychnis flos-cuculi)

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### What do I look like?

A perennial herb, with ragged pink starshaped flowers. I can grow up to 80cm tall and on a rare occasions my flowers can be white (keep an eye out!).

### Where do I grow?

I love damp ground, where my roots will be wet, but not submerged. You can find me in floodplain grasslands, fen meadows, and around the outer edges of ponds and ditches.

### What do I like?

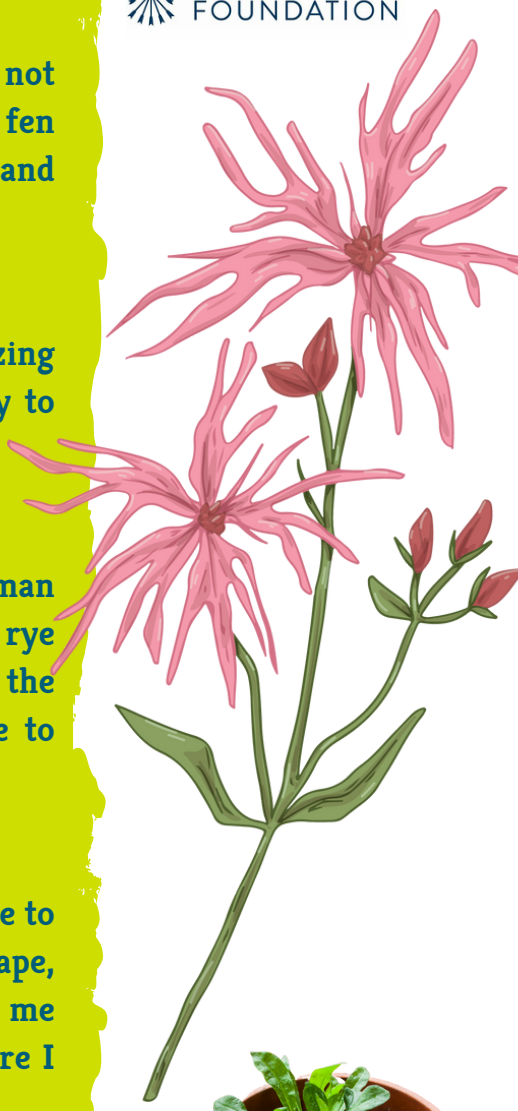
Clean unpolluted water with low nutrient levels, grazing from large herbivores and areas that are cut annually to reduce competition from other plants.

### Why am I declining?

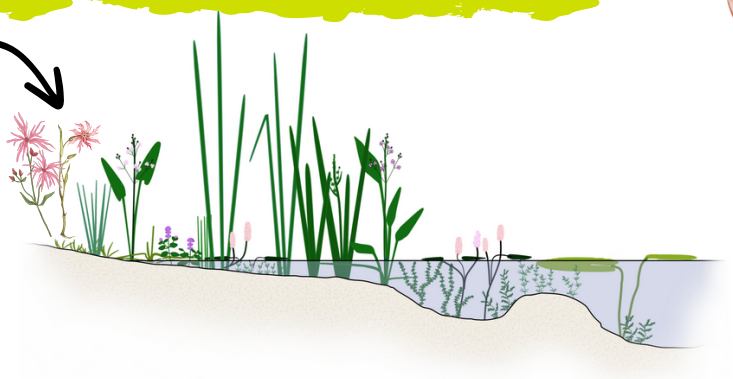
Poor water quality and high nutrient levels from human impacts. Nutrient pollution causes some species, like rye grass, to grow very rapidly and smother me out. Over the centuries much of my habitat has also been lost due to drainage of wet meadows and infilling of wetlands.

### How can you help me?

Grow me on into a big strong plant at school. Make sure to hand me back so I can be re-introduced into the landscape, helping to improve wild populations. Please don't plant me in your garden pond. I need to be out in the wild where I can make a difference.



I live here! Right at the margins and in damp meadows



# How to grow your seeds

### How can you propagate me?

I'm a flowering plant that reproduces via pollination between individuals. I produce seeds which will germinate into plants (please collect seeds if I produce them). You can also take cuttings, or spilt out my roots to create clones of me.

1. First prepare your seed tray by filling each section with compost so that each cell is 3/4 full.

2. Lightly compact the compost- this will stop water running through it too fast.

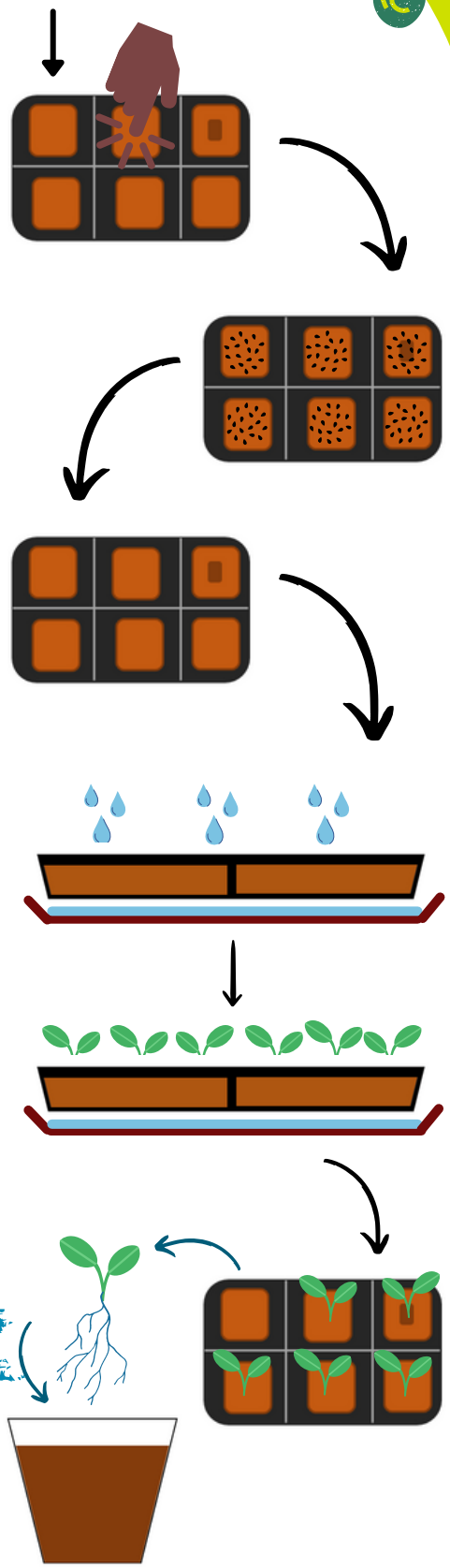
3. Scatter 5 - 10 seeds evenly into each cell and cover the seeds in a thin layer (a few mm) of compost.

4. Gently water the seeds in the pot, trying not to wash the new compost or seeds away.

5. Water your seeds once a day and place the pot in a tray of water so that the compost stays moist.

6. Once the roots begin to grow out of the holes in the bottom of the cells, it is time to move each small plant into its very own small pot.

7. Pop your newly potted plants into a saucer of water and pour water into the saucer daily.



## Health & Safety

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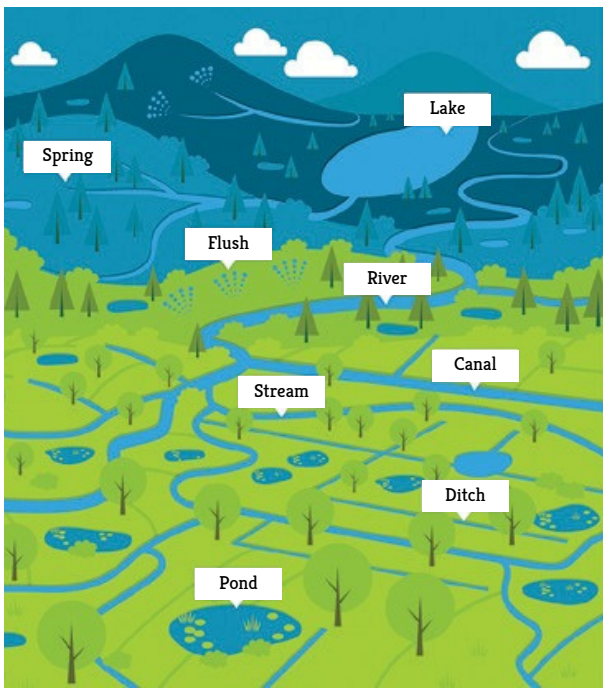
# Clean Water Survey

Freshwater wildlife needs clean, unpolluted water to survive. Sadly it only takes a little pollution to damage habitats like streams and ponds and to harm the most sensitive plants and animals that call these places home.

With your help, water quality surveys aim to find the hidden gems - places which are free from pollution and where wildlife still thrives. The survey also aims to discover for the first time, the true extent of nutrient pollution facing freshwater wildlife today.

## Summary of the steps involved

- Identify the body of water you want to test.
- Find a grid reference to help us locate the relevant water body. For instructions on how to find a grid reference or 'what3words' visit the WaterNet Data Hub page on our website.
- Take a water sample (Health & Safety and Biosecurity guidance can be found on our website).
- Measure the amount of two nutrients in the water, nitrate and phosphate, using the kits.
- Fill out a survey sheet for each sample.




## Using your clean water kits

1 Pull out and discard the yellow pin leaving a small air hole.


Pull out the pin and discard

2 With the air hole pointing upwards, use your finger and thumb to squeeze out the air.

3 Keeping the air squeezed out, turn the tube upside down and insert below the water.

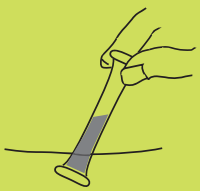

Keep the pin hole upwards and squeeze out the air

4 Gently release the pressure and suck up enough water to fill the tube just over half way.

5 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.

Still squeezing, turn tube upside down and insert below the water

6 Gently shake the tube to mix the water and powder inside.


Let go, to suck up just over half a tube of water

7 Make a note of the time and wait for the colour reaction.

**Nitrate: 3 mins**
**Phosphate: 5 mins**

8 Compare the tube with the colour chart immediately when the time is up, as the colour will continue to develop.



Leave for the set time and compare with the colour chart

9 Record the results below and enter them online or via email

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# Recording your Clean Water for Wildlife results

**Surveyor name(s)** - your name and anyone with you collecting the sample e.g Anne Smith, John Smith.

**Recording group**- if you are collecting results on behalf of a group, enter the name e.g. Wild About Cheshire.

**Email**- Please supply your email address to receive the online results for your survey.

Grid reference 8 figure e.g. SP 1234 1234 (or postcode / what3words)

If you don't know this, make a note of the waterbody location, so you can find the site later on a map. Go to the the WaterNet Data Hub page on our website for more information.

**Date**

dd/mm/yy

**What type of waterbody did you sample?** (please tick one).

Garden pond ☐ Other pond ☐ Lake ☐ Ditch ☐ River ☐ Stream ☐

Other (please state)

**Name of waterbody** e.g. Collier Pond, or pond in Stubbs Wood (if pond name not known).

## Recording the level of nutrients

1 Once the development time is up, compare your N or P tube with the corresponding chart (right).

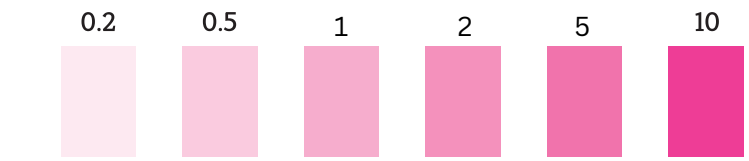
2 The chart is based on ranges e.g. my colour falls between 0.5 and 1. Tick one.

3 If the tube hasn't changed colour at all - tick the lowest range category <0.2 N, or <0.02 P.

4 If your tube matches one colour exactly, tick the higher range e.g. if recording 0.5, tick the range 0.5-1.

**Submit your results online using the FHT WaterNet Data Hub on our website freshwaterhabitats.org.uk**

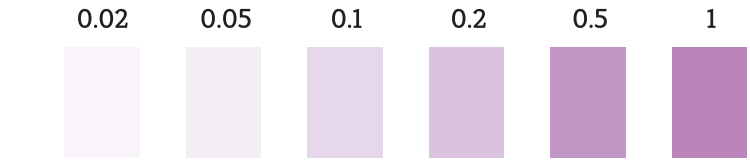
**N: Nitrate (ppm) colour chart Wait 3 mins**




☐ <0.2 ☐ 0.2-0.5 ☐ 0.5-1 ☐ 1-2 ☐ 2-5 ☐ 5-10 ☐ 10+

**Range categories (tick one)**

**P: Phosphate (ppm) colour chart Wait 5 mins**




☐ <0.02 ☐ 0.02-0.05 ☐ 00.05-0.1 ☐ 0.1-0.2 ☐ 0.2-0.5 ☐ 0.5-1 ☐ 1+

**Range categories (tick one)**

# Water Quality Testing Worksheet

## Results:

| Group Name / Number | Type of Water | Predictions | Phosphate levels | Nitrate levels |
|---|---|---|---|---|
| | | P =<br>N = | P = | N = |
| | | P =<br>N = | P = | N = |

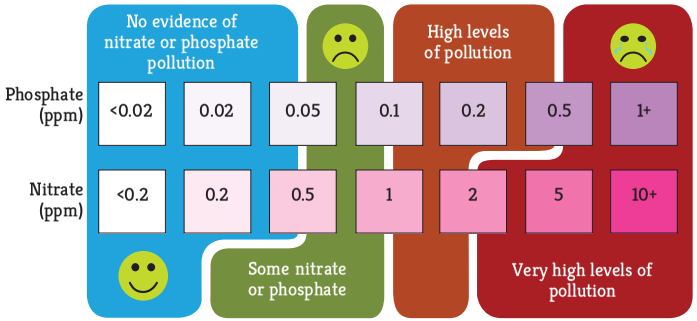
1. What are the main sources of water pollution?

2. Which type of water would be best for biodiversity (the plants and animals that live in it) and why?

3. Name 3 things that can you do to help prevent pollution

# Understanding your Clean Water Results

**Use the diagram and information on this page to help interpret the results from your kits.**




## No evidence of nutrient pollution.

Congratulations! You are likely to have found a fantastic clean water habitat. Water that's not polluted by nutrients will show little or no colour change in either test. This is great news as many animals and plants, especially rare and endangered species, need to live in water that is naturally very low in nutrients.

We really want to find out about these sites as they could be amongst the very few remaining sites, the best of the best undamaged freshwaters in England and Wales.

This information will be valuable for monitoring site condition and making decisions about site management. The next step could be to undertake a biological survey to find out which species are present. Clean water sites often support rich and interesting wildlife communities.

## Evidence of some nutrient pollution.

Unfortunately you have found a site where the water is polluted by nutrients at levels that will be damaging to wildlife. Polluted waters will still have some wildlife – but they won't have the wonderful richness of life, or rare species that live in clean water. At even these moderate levels of nutrient pollution more than half the animals and plants that should be present can be lost. If this was your garden pond, make sure you're topping it up with rain water, rather than water from the tap (see next page). If this is a pond in your neighbourhood, find out whether anyone is working with local farmers or the local councils to make the environment as good as it can be. It's very difficult to remove nutrients from polluted habitats, but knowing the limitations can help to guide the way sites are managed.

## High or very high levels of nutrient pollution.

Oh dear, this site has high levels of nutrient pollution. Even tougher species sometimes find it hard to make a home in a site like this. Don't give up! There may be clean unpolluted sites in your neighbourhood waiting to be found. Take another kit and look somewhere else. What about trying a different habitat like a pond or stream? Look at the website to find out if anyone has recorded a clean water site near you – worth a visit if you want to see freshwater habitats thriving with wildlife.

**AND FINALLY: Some places with very low nutrient levels, may still be affected by other issues which the kits do not detect.**

**There's more information in our technical guide on the use and reliability of the kits - available on our website.**

## Explaining your findings in different types of habitat

Rivers, streams and ditches. Running waters like these collect water from huge areas of land. In the lowlands, there are so many nutrients draining from farmland and urban areas, that it is very rare to find any rivers or even large streams which aren't polluted by nutrients. The cleanest sites, with the least nutrients, tend to be small streams or ditches that start their life in woodland or unfertilised grassland, because they haven't yet had an opportunity to become polluted.

Countryside ponds. Some ponds have very clean water and thriving wildlife. A pond on a hill, in woodland or heathland, draining land which is undeveloped or farmed, may have few pollutants. Similarly, new ponds or recently dredged ponds may also have few nutrients in them, as polluted silts haven't had time to accumulate. On the other hand, many ponds in heavily farmed areas, or with lots of ducks, or with a stream (or ditch) running in to them, will usually have high levels of nutrient pollutants.

Tap water: Tap water is often surprisingly high in nutrients. They aren't damaging to human health, so it is not necessary to remove them completely from the water supply. The amount of nitrate in drinking water is regulated by law.

Garden ponds. When garden ponds are well designed and fed by rain water, they can be great habitats for wildlife. Those filled by tap water can be high in nutrients and may show signs of pollution. Ponds with fish can also have high nutrients from added fish food and fish poo.

Water butts. Usually low in nutrients. are actually added to tap water. Water butts are usually fed by rain water to protect us from the risk draining from roofs. Rain water posed by lead contamination is naturally low in nutrients, so water from old pipes. If you want to butts should have very low levels of make a pond that is good for nitrate and phosphate. If not, there must wildlife in your garden, fill it be something else adding nutrients; with water from a water butt, either from the roof or elsewhere. not from the tap.

**Discover more online:**
The project website has lots more information to help you interpret your results.

You'll be able to:

- Look at your own results and compare them with other people's on UK and regional maps.
- See how many places that have been tested are clean, and how many are polluted by nutrients.
- Find out which types of habitat are generally cleanest for wildlife, and which parts of the country have the best and worst water quality.
- Explore the data to answer your own questions – for example: are garden ponds providing clean water habitats?

GET ACTIVE:

We can all do something to help reduce the impact of nutrients on the freshwater environment.

- Shout about the best sites you find – get them included in local wildlife plans.
- Reduce the nutrients in your home and garden – use low phosphate products and fill your garden pond with rainwater.
- Make your own clean water habitats – bring wildlife back to your neighbourhood by creating new clean water ponds
- Get hands on and join a local wildlife volunteer group.

There are lots more ideas and information on our website. Visit freshwaterhabitats.org.uk