Sussex Wildlife Trust Aq7

Pond Investigations

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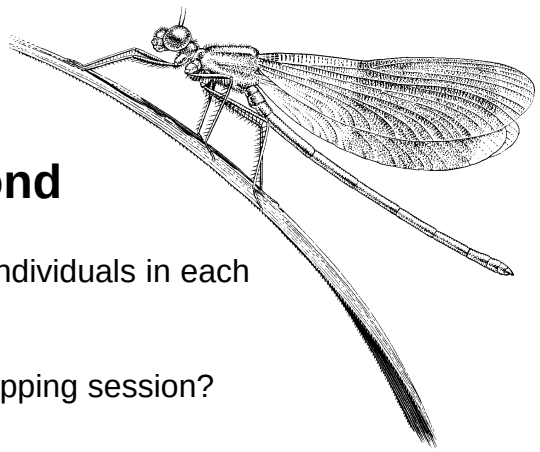
Use keys to identify pond creatures

Use keys to identify pond plants



Compare different habitats within a pond

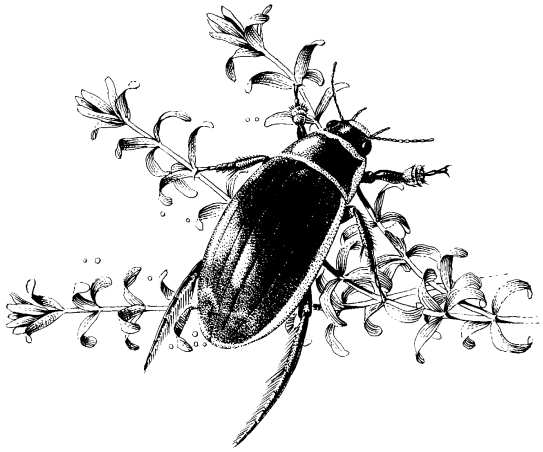
Dip in open water and areas with pond weed.
Observe the difference in number of species and number of individuals in each area.

Does the quantity of each catch change throughout a pond dipping session?

Collect a data base of information about the pond

This data can be analysed to find variation throughout the year and over the years.
Think about using a uniform sampling technique eg 10 dips
You may want to vary or keep constant the:

- location of dip
- depth of dip
- time of dip (in the day)
- time of dip (in the year) - is there a seasonal variation?
- method used (sweep or dip)



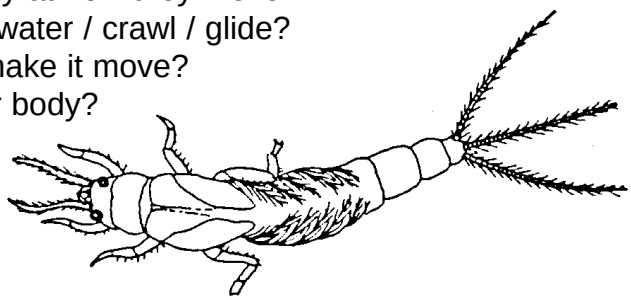
How healthy or polluted is the pond?

Look for evidence of pollution eg rubbish / oil film on surface.
Take photos using a digital camera to record the state of the pond.

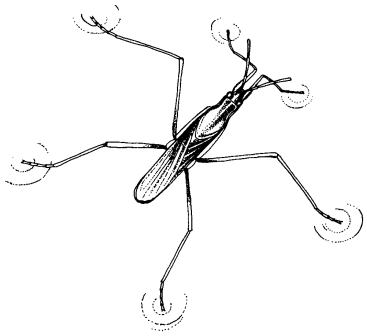
The variety and type of species found in the pond give an indication of how healthy / oxygen rich the pond is. Use the pollution sheets to work out a biological index for your pond.
How does this change throughout the year?
How does this change as your pond matures?

How do pond animals move?

Observe a variety of animals, looking particularly at how they move.
Do they skate across the surface / swim in the water / crawl / glide?
What part of the body does the animal use to make it move?
Do they use their legs / antennae / wriggle their body?



How do some animals swim on the surface of the pond?



Place a piece of tissue on the surface of a bowl of water.
Float a needle on it to demonstrate the skin of the water.
What happens to the tissue? / the needle? / the skin of the water?
Look at how the tips of a pond skater's legs make a dent in the water.
Add a drop of washing up liquid. What happens?

What happens if the surface of the pond is destroyed by pollutants?

What do pond animals feed on?

Watch an animal carefully to see what it feeds on.
If you don't see it feeding, make some observations.

If it is a carnivore, it might have large eyes to help find its prey, large jaws for holding and biting its prey, large antennae to help find its prey, claws on its legs for catching and holding its prey and it might move fast
If it is a herbivore, it is likely to be slower and might have a transparent body so you may be able to see its green gut contents

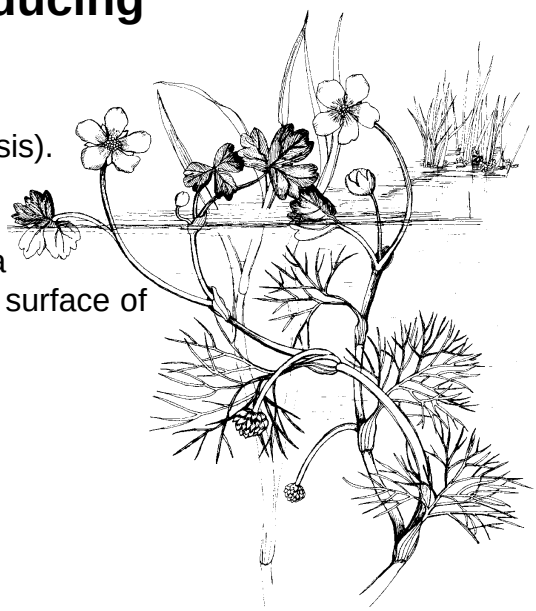
Extension 1: construct food chains and food webs to show feeding relationships within the pond.
Extension 2: compare the abundance of herbivores, carnivores and omnivores in the pond.

How do pond animals get oxygen?

Observe a tank of animals and note which come to the surface regularly and which ones remain below the surface.
Extension: time the interval that different creatures remain under the water between breaths.
What is the effect of depletion of oxygen in a pond on pond life?

Many small creatures absorb oxygen through their body surface.
Some snails come to the surface to fill a lung.
Most small pond creatures have a gill (extrusion of the body wall) - these usually absorb oxygen. However the gills on a Mayfly nymph don't absorb oxygen themselves, but create a current over the surface of the organism enabling more efficient absorption.
Beetles often come up to the surface for oxygen which they take down as silver bubbles trapped between their back and wing. Mosquito larvae hang below the water surface and collect oxygen through a tube which penetrates the water surface.

Investigate the role of plants in producing oxygen in a pond.



As well as being a food source for pond herbivores, pond plants also produce oxygen (a by-product of photosynthesis).

Place some pondweed in a beaker of pond water with a funnel and up-turned test tube over the top and leave in a sunny position. Bubbles of oxygen should appear on the surface of the leaves and oxygen collect in the test tube.

Investigate the effect of the seasons on the animal and plant life in a pond?

Compare the number of species found in the summer and winter.
Compare the abundance of organisms collected in summer and winter.
Compare the distribution of plants on the margins and surface of the pond.
Compare the number of animals found just below the surface, amongst the weed and just above the bottom of the pond.
Record the water temperature throughout the year.

Most plants die back in winter, leaving less food for animals. This means a decrease in abundance of animals in winter. As the water temperature drops, animals which have survived move to deeper warmer parts of the pond. Many insects survive the winter in the egg phase - eggs have a tough covering and survive severe conditions then hatch in the spring when the weather is better. Many plants also over-winter as seeds. Perennial plants may have underground stems which store food for new growth in the spring. Some plants produce special buds, which sink to the bottom of the pond and spend the winter there.

Management and maintenance of a pond

Consider making one year group responsible for the management and maintenance in a pond. Discuss the importance of balance in a pond and how this information is needed for effective maintenance.

Use a digital camera to record the amount of weed in pond, vegetation height around the pond and water level.
What effect does this have on the pond?
More pondweed and shade means more plant debris which uses up vital oxygen supplies in the process of decay.
Check for signs of pollution
What might happen to the pond if it was left and no maintenance carried out?