

Ecology terminology

Complete the blanks beneath using the glossary in your textbook.
Cut out and place in an envelope and use for revision.

Word	Definition
	A group of organism which is distinct in being genetically different and usually isolated in its breeding from other groups of organisms.
Abiotic	The non living aspects within the environment e.g. light, rock
Pest	
	The place where an organism lives
Biotic	The living aspects within the environment.
Sampling	A small part, number or quantity of something that has been taken or selected.
Environment	
Food Web	
	Any chemical used to kill or control pests.
Biodiversity	

WILDSpace

HACKNEY

AUGUST 2006

SPECIES IN DECLINE AS EUROPE FAILS TO MEET BIODIVERSITY TARGETS

QUESTIONS

1. Highlight the term **biodiversity** in the text.
2. What does **biodiversity** mean?
3. Highlight **ecological footprint**.
4. What does this term mean?
5. Highlight the 2 reasons given for the decline in biodiversity in Europe.
6. Underline the biodiversity target. List 4 other targets that you think Europe need to have set if they want to stop the decline of biodiversity.
7. How is this local article linked to the article above?

The amount of land covered by towns and cities in Europe increased by five times the size of Greater London in the 1990s, at the same time as the continent has failed to protect its biodiversity.

A report, by the UN Environment Programme (UNEP) and the Council of Europe, says there are 800 000 hectares of built-up areas in Europe. The harmful impact of urban areas on the environment is highlighted by the example of London.



Housing in London: can a balance be found between humans and nature?

London's 'ecological footprint' - the amount of land needed to provide resources to support the city and absorb its wastes - is estimated to be twice the size of Britain.

'Humanity continues to use resources at an unsustainable level,' the report says. Europe's failure to protect the environment is also threatening biodiversity. For example, the numbers of many species of moths in Britain are declining at an alarming rate.

The protection of species, both those classified as under threat and others selected at random, is one of the targets that Europe is failing to meet.

SHOCK OVER PLANS FOR DEVELOPMENT AT WEST RESERVOIR



West Reservoir

London Water is considering draining one of the water habitats found at West Reservoir, it was

reported last week. A housing shortage across London has made the selling of underdeveloped land very profitable, and London Water is quoted to have said that the company needs to find funds to repair old pipes in Hackney to decrease the amount of water lost through leakages per year. The Environmental Trust

and other local campaigners are against the drainage claiming that a decline in bird numbers will be seen if food is removed from lower down the food chain.

Hackney borough council are planning to give their response to the suggested development in the forthcoming months.

Can you spot the risks?

How might you decrease the chance of a risky situation occurring?

Look at the photographs of the site you are going to visit.

What potential risks can you think of for a class of students?

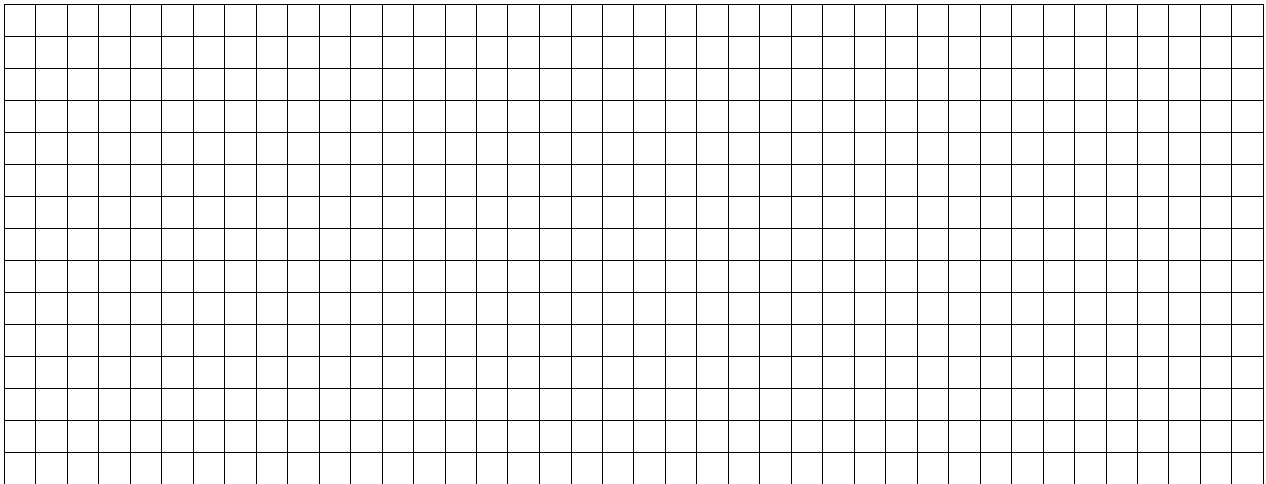
What precautions could lower the potential of the risk happening?

Potential risk	Control to lower risk
<i>Being run over on the walk to the site.</i>	<i>Pupils to walk in pairs and to cross only at official crossings.</i>

Analysis of results

1. Using the cards lay out the food web for some of the organism found in the aquatic habitat you studied.
2. Identify one organism at each trophic feeding level using the food web above and the results table, e.g. one detritivore; one herbivore; one carnivore; one top carnivore.

Using your data draw a pyramid of numbers below. Label each trophic level.



3. Think about your results to help you answer the questions below. Remember to explain your answers.
(a) If the duck and pond weed were to decline rapidly due to a change in environmental conditions, what effect would this have on the:
(i) lesser boatman numbers, and (ii) fish populations?

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- (b) If the aquatic habitats were drained at the site for building upon, what would be the effect on the birdlife in the area?

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(c) If people were to introduce non-native fish into the water (such as carp and gold fish) what would be the effect on (i) the fish population, and (ii) the invertebrate population over a short and long period?

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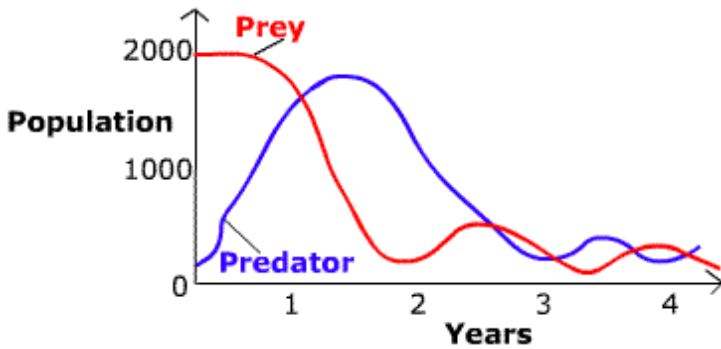
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(d) What effect could this have on the food chain if cormorants were culled by humans?

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A graph to show the relationship of organism numbers between a prey and a predator.

4. Extension

(a) Using the graph above can you explain the changing population numbers of both predator and prey numbers over the years?

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(b) Draw a graph to show the effect on the fish population (predator) if the dragonfly and mayfly nymph numbers increased dramatically due to a change in environmental conditions.

Adaptations

1. Think about the animals that you observed... if you decided to live underwater how would YOU have to change yourself?

List 3 things that you would need to change or grow so you could survive.

- 1.
- 2.
- 3.

2. Use the *Adaptations Cards* to help you complete the table.

Adaptation for movement and buoyancy	Animal Name - Example 1	Animal Name - Example 2
Suckers	<i>Leech</i>	
Streamlined shape		
Paddle-like legs		
Flattened shape		
Air sacs		
Bristles		
Adaptations for obtaining oxygen	Example 1	Example 2
Scuba divers		
Gills		

3. (a) Which type of adaptation for movement and buoyancy was most common in the pond?

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(b) Animals which are found in streams are usually more streamlined in shape than animals which live at the bottom of the ponds. Why do you think this is?

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4. (a) Consider your sampling technique. There may be more species of invertebrate that live in the pond than you have found. How could you reduce the number of species that you may have missed?

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(b) Identification of invertebrates can be difficult. What methods could be used to improve it? Could a form of technology help?

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Research

Choose **two** species that you have identified today and find out more about the species and how it is adapted to live in the habitat were you found it.

Website to help - <http://www.naturegrid.org.uk/children.html>

Species name

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Diagram (labelled)

Use a separate piece of paper for your second species



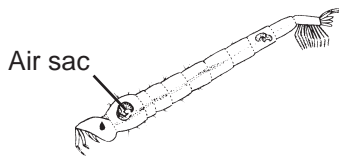
Streamlined shape

The streamlined shape with bulky head, fins and tail lets the stickleback and animals such as mayfly nymphs swim rapidly through the water



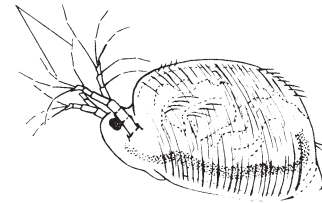
Paddle-like legs

The last pair of legs are long and fringed with hairs, allowing the water boatman and water beetles to 'row' through the water



Air sacs

Air sacs in animals like the non-biting midge larva and phantom midge larva allow the animal to stay in the same place without sinking



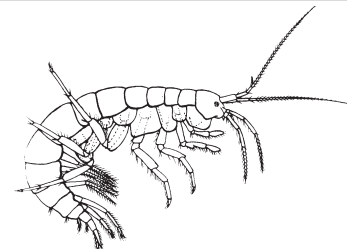
Bristles

Some animals, such as the water flea and water spiders, have abundant bristles, which increase resistance to water and prevent rapid sinking



Suckers

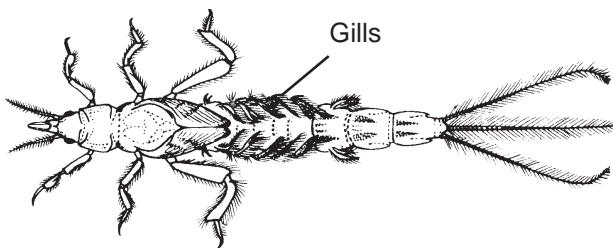
The leech has suckers which can hold the animal to the bottom of a stream. It moves by looping along with the help of its suckers



Flattened shape

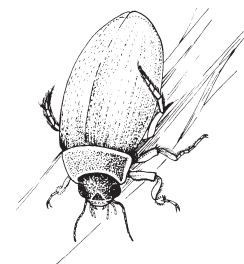
Some animals are flattened, such as freshwater shrimps and flatworms, so that they can avoid the current by sliding over the stream bed

Adaptations for obtaining oxygen



Gills

Mayfly nymphs and damselfly nymphs can extract dissolved oxygen from the water through their gills



Scuba divers

The diving beetle and water boatman have hairy bodies which trap air bubbles from the surface. They take air with them when they dive.

Comparing different areas

(a) Abiotic data

Observations in the field

Date and time site visited	
Weather conditions	

Site One

	Field notes
Name of site	
Temperature of water	
Water pH	
Describe the vegetation	

Site Two

	Field notes
Name of site	
Temperature of water	
Water pH	
Describe the vegetation	

Site Three

	Field notes
Name of site	
Temperature of water	
Water pH	
Describe the vegetation	

(b) Biotic data

Species	Feeding level	Habitat location (frequency tally)			Totals
		1	2	3	
Alderfly larvae	C2				
Beetle larvae	C1				
Biting midge larvae	D				
Blackfly larvae	D				
Cased caddis fly larvae	H/C1				
Caseless caddis fly larvae	H/C1				
Damselfly nymph	C2				
Diving beetle	C2				
Dragonfly nymph	C2				
Flatworm	C1				
Freshwater clam	D				
Freshwater hoglouse	D				
Freshwater shrimp	D				
Greater water boatman	C2				
Leech	C1				
Lesser water boatman	H				
Mayfly nymph	H				
Mosquito larvae	D				
Non biting midge larvae	D				
Phantom midge larvae	C1				
Pond skater	C1				
Pond snail	H				
Ramshorn snail	H				
Stonefly nymph	C1				
True worm	H/D				
Water beetles	C1				
Water flea	H				
Water mite	H				
Water spider	C2				
TOTAL NO. OF SPECIES					

H = herbivore (primary consumer)


D = decomposer/detritivore

C1 = primary carnivore (secondary consumer)

C2 = secondary carnivore (tertiary consumer)

Trophic level cards

eats: leech
shrimp and
mayfly nymph



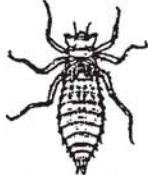
eaten by:
dragonfly
nymph

eats: damselfly,
leech,
lesser
waterboatman




eaten by: fish

eats: leech and
greater
waterboatman



eaten by: fish

eats: dragonfly and
mayfly nymph,
leech, scorpion and
fleas




eaten by: ?

eats: dead remains




eaten by: greater
waterboatman,
leech, scorpion

eats: pondweed
and dead remains



eaten by: greater
waterboatman

eats: water flea and
lesser waterboatman




eaten by: fish and
greater
waterboatman

eats: shrimp and
lesser
waterboatman




eaten by: fish,
dragonfly, scorpion


Pond weed



Algae




eats: algae




eaten by: fish and
damselfly nymph

eats: duckweed and
dead remains

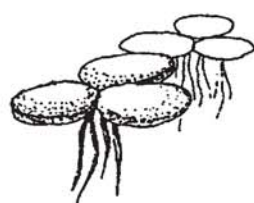


eaten by: fish,
damselfly and
scorpion

Dead plants and
animals



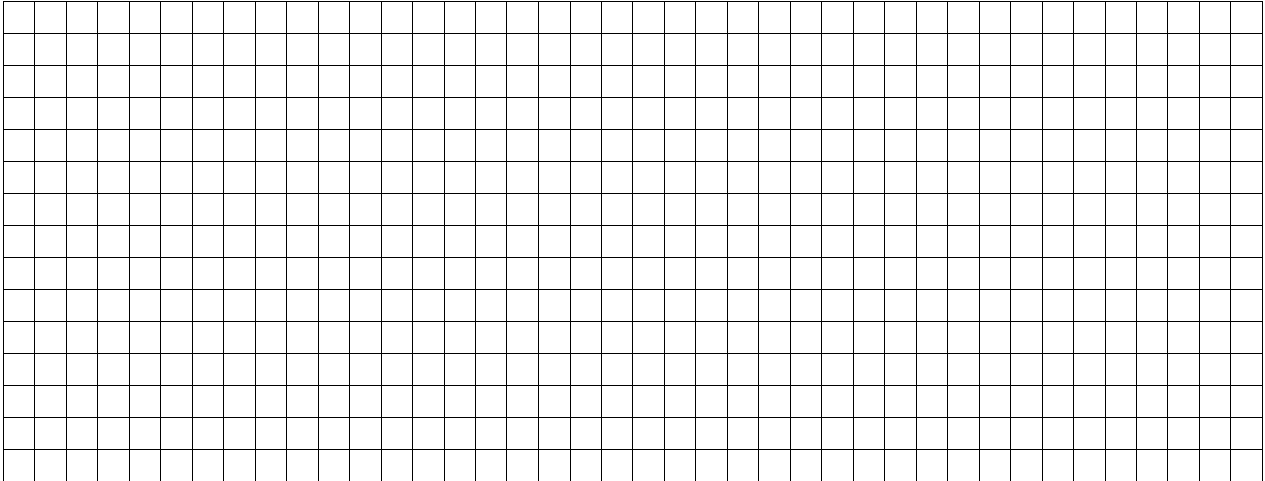
Duck weed



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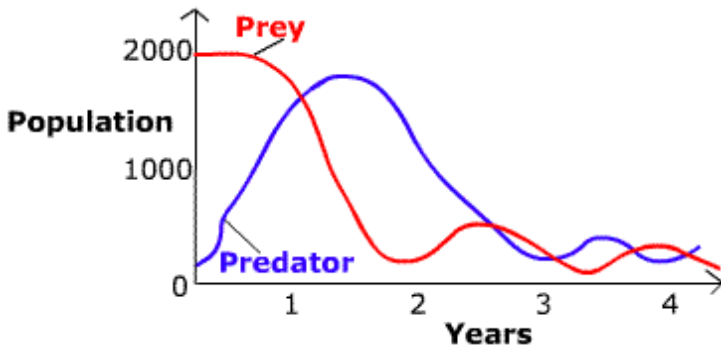
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Evaluation of results

1. Consider your method. List the difficulties that your group found. Suggest improvements that could be made so other groups will not encounter the same problems.

Difficulties found	Improvement
<i>Counting all the animals that were very small, such as water fleas.</i>	<i>I used a hand lens. In the future I could estimate (sample) just one area of my tray.</i>

2. Hackney Council is considering draining and building on this site. They would like you to present at a meeting the research that you have completed.

How confident are you in your data? Do you feel you have enough to discuss with the council? Explain your answer as if you are writing for council members.

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