

## Rutland Water Interactions

### Introduction

This is designed as an extension activity for more able students studying Science at GCSE (Single Science Biology) or for Biology A-level students.

Perhaps a good start would be to consider some of the common types of interactions between organisms.

**Competition** – for resources space, food, and competition for light between plants.

- Intra specific competition, between individuals of the same species
- intraspecific competition is between individuals of different species

**Mutualism, symbiosis, and commensalism** – Types of co-operation between organisms

**Predator - prey** An animal eating another animal

**Herbivore** An animal which feeds on plants

**Scavenger** An animal feeding on dead animals

**Detritivore** An animal feeding on dead plants or land waste.

**Host – Parasite** A living organism(host ), which remains alive and is the food source of another organism (parasite)

**Niche** Where an organism “fits” into its ecosystem. A feeding position, or physical place.

### The interaction model;

Interaction between organisms can be summarised as:

+ Gain	- Loss	○ No effect, no gain or loss.
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The main types of interaction are shown in the table on the pupil sheet with some of the biological words above .

The aim is to identify the two organisms in the description and decide on their interaction. Teachers may wish to get a set of paired pictures for students to give them a better idea of their features and their size.

Students should be able to argue or justify their answer. Although most answers can be worked out from the statement, some additional research may help to add extra details.

## Rutland Water Interactions

### Answers with points for discussion

Some are debatable so the students need to reason their answer!

- 1. Reed warblers + spider's (webs) -**  
The spider does lose as its way of catching food is removed!
- 2. Egyptian geese + ospreys -**  
The Geese take the nesting space from the osprey
- 3. Avocets - black headed gulls -**  
Both compete for same space to nest so both may lose
- 4. Bitterns + reeds -**  
Bitterns gain a nest space but the reeds are used in the nest
- 5. Cuckoos + reed warbler -**  
The cuckoo is a "brood parasite" fed by the warbler (host). The cuckoo pushes the warblers eggs or chicks out of the nest , another loss for the warbler!
- 6. Ladybirds + dead reed mace/ rushes o**  
Ladybirds gain a space, the reeds/rushes are already dead
- 7. Water snails + bacteria +**  
An example of symbiosis, where both organisms gain
- 8. Bees + water lily (flowers) +**  
Both have a mutual benefit from the interaction
- 9. Ospreys + trout -**  
The osprey is a predator of the trout, a classic " + - " interaction.
- 10. Jackdaws + green woodpeckers o**  
Green woodpeckers only use nest holes once



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### Answers with points for discussion - cont.

Some are debatable so the students need to reason their answer!

- 11. Dragon flies + midges -**  
Predator (dragon fly) and prey (midge) interaction
- 12. Flat flies + swallows -**  
The flat fly is an ectoparasite on the swallow which is the host
- 13. Bats o swallows o**  
Although both have the same food (flying insects) they feed at different times. Bats are night (nocturnal) feeders and swallows day (diurnal) feeders so do not compete.
- 14. Earth worms + deciduous trees (dead leaves) o**  
Earthworms are detritivores feeding on dead leaves
- 15. Newt + wading birds o**  
The newt benefits from dispersal, but the wading bird does not gain or lose from this interaction
- 16. Algae + water snails +**  
Mutual gain with the algae gaining a way of moving and the snail camouflage
- 17. Curlews o Ringed plover o**  
Curlew and Plover have different feeding niches due to beak length
- 18. Red kites + rabbits o**  
Red kites are scavengers feeding on dead rabbits
- 19. Lichens; alga + fungus +**  
Symbiosis, an association where both organisms live in close association and gain by the relationship
- 20. Deer + grass -**  
Deer are herbivores and graze the grass for food. The grass loses from this.