Science

Science

Introductory Notes for Teachers

The Science section of this folder has been designed to meet the requirements of the National Curriculum. **'Living things in their environment'** is particularly relevant here and the curriculum stresses the importance of studying the local area, linking with Curriculum Cymreig also.

Background notes and children's activity sheets are provided that focus on local species and habitats to assist teachers who wish to give a local emphasis when studying **feeding relationships and adaptation.** The pictures of local plants and animals could also be used for key work. In addition, these materials would be useful background for pupils comparing local habitats.

Some of this material could be adapted for use by Key stage 3 pupils eg. by the development of a food web.

Emphasis has been given to local species that are particularly unusual eg. Great crested newts.

Please note that the great crested newt is a protected species and it is illegal to move or disturb it without a licence. You are not likely to find large numbers of Great crested newts when dipping in the smaller Halkyn ponds; the smooth or palmate newts are more frequently seen. However, prior to pond-dipping in the ponds at Ochr-y-foel or any others on Halkyn Mountain, permission is needed from the Countryside Council for Wales. (Tel: 01352 706600)
Deeside Urban Wildlife Group have a group licence for pond-dipping and may be able to accompany your group. They can also provide equipment. (Tel: 01244 541005)

Science

KS2 Science

Living Things in Their Environment

adaptation

1. to find out about the variety of plants and animals found in different habitats including the local area eg. by fieldwork, reference books or software.
2. how animals and plants in two different habitats are suited to their environment

feeding relationships

3. that food chains show feeding relationships in an ecosystem;
4. that nearly all food chains start with a green plant

variation

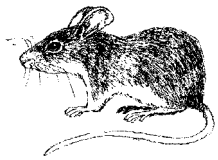
5. how locally occuring animals and plants can be assigned to groups, by making and using keys

WHAT'S ON THE MENU TODAY?

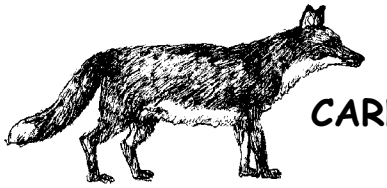
GREEN PLANTS are PRODUCERS who make their own food using the sun's energy.

ANIMALS are CONSUMERS who get their energy by eating plants or other animals.

There are 3 groups of Consumer:



HERBIVORES *who eat plants.*



CARNIVORES *who eat other animals.*

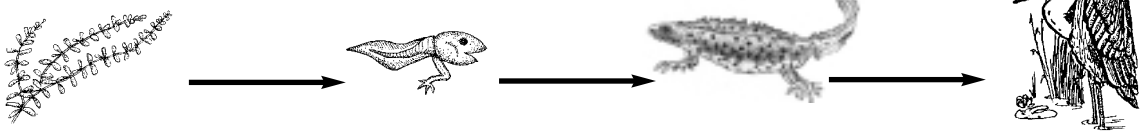
OMNIVORES *who eat both plants and other animals.*

Here are the preferred foods of some of the local animals.
Are they carnivores, herbivores or omnivores?

fox	mice, voles, shrews, birds, insects
peregrine	birds up to the size of crows
buzzard	birds, rabbits, mice, voles, shrews
rabbit	grasses and other plants
mouse	nuts, seeds and berries
meadow pipit	mainly insects
badger	worms, frogs, mice, fruits, caterpillars,
plant bug	juices from plant stems
slug	leaves and fruits
ground beetle	worms, slugs and insects
bat	moths and other flying insects
great crested newt	water and land insects, tadpoles
pigeon	seeds, grain
wagtail	insects
raven	a wide range of plants and animals

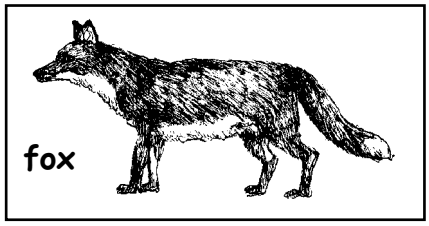
The feeding relationship between plants and animals in the same habitat is called a **FOOD CHAIN.**

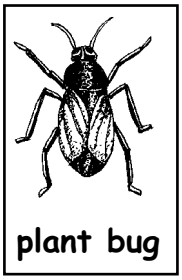
eg pondweed is eaten by **tadpole** is eaten by **a newt** is eaten by **a heron**

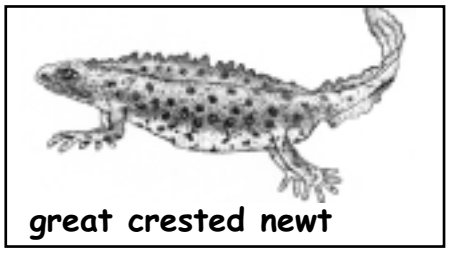


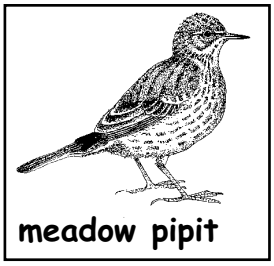
MAKE YOUR OWN FOOD CHAINS!

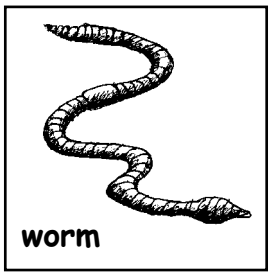
Cut out the plants and animals from the sheet and see how many food chains you can make. Most animals have several favourite foods so there are lots of possibilities. Use arrows to link the chains.

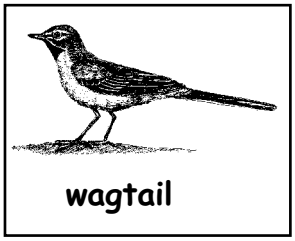


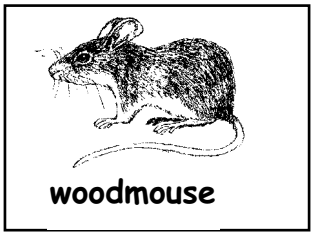


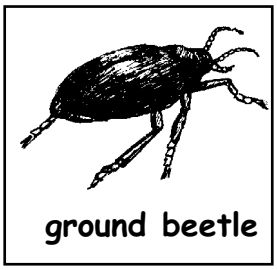


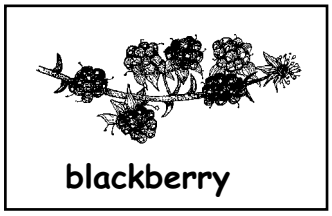


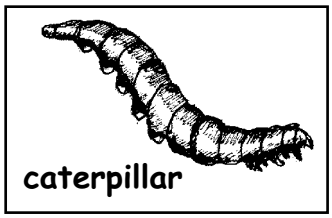


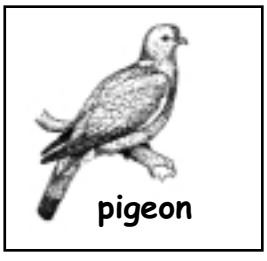


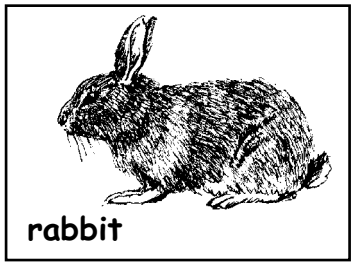


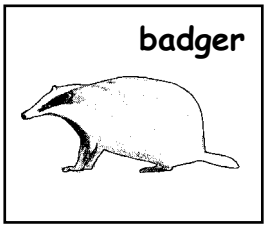


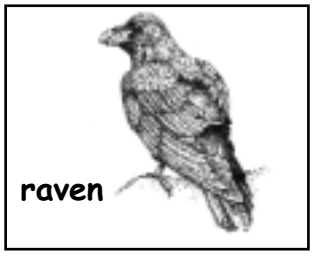


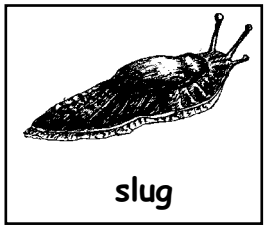


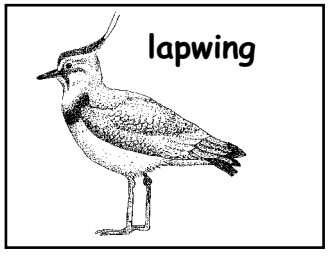












Teachers' Notes:
Halkyn Mountain Adaptation Game

Materials provided:
3 grids for feeding; defence and protection; and movement
1 set of animal images
Preparation: Photocopy and cut out sets of each grid and the animal images.

Activity description
See if the children can match the creatures to the descriptions in each category, filling up each card with the
correct sets of pictures. They can work in groups of two or three.

Answers
Courtship and breeding
Badger - 2-5 cubs are born in February but remain underground, fed by their parents, until April.
Dragonfly - We fly around in tandem (joined together) before mating.
Bat - Our females usually form nursery colonies away from the males to raise their young.
Great crested newt - Our males develop a jagged crest and bright orange stomach in the breeding season.
Pied wagtail - Two or three males chase a female in a wavy flight.
Meadow pipit - I nest on the ground, well hidden in vegetation.

Movement
Bat - I fly using the wide flaps of skin that join my fingers.
Pied wagtail - I wag my tail up and down as I run or stand. I can fly well too.
Badger - I waddle a bit as I walk but can run quite fast.
Peregrine - I fly superbly at great speed and dive to catch my prey.
Great crested newt - I crawl slowly on land but swim superbly using my tail.
Dragonfly - When I'm young I slowly crawl or swim but as an adult I'm a strong flier.

Feeding
Buzzard -I love rabbits - I spot them from high above and swoop down to catch them in my talons.
Dragonfly - As a youngster I catch my prey of water creatures by releasing my hinged jaws. In adulthood I catch insects as I fly using my front legs.
Great crested newts - I love tadpoles but also many other garden creepy-crawlies.
Badger - I love earthworms which I dig up with my strong claws but I also eat mice, frogs, fruit and nuts.
Bat - I feed on moths as I fly, finding them by echo-location.
Meadow pipit - I enjoy flies and other insects.

HALKYN MOUNTAIN ADAPTATION GAME

Courtship and breeding

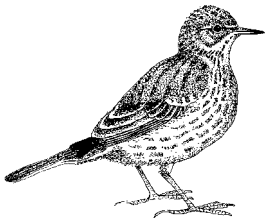
2-5 cubs are born in February but remain underground, fed by their parents, until April.	We fly around in tandem (joined together) before mating.	Our males develop a jagged crest and bright orange stomach in the breeding season.
Our females usually form nursery colonies away from the males to raise their young.	I nest on the ground, well hidden in vegetation.	Two or three males chase a female in a wavy flight.

Movement

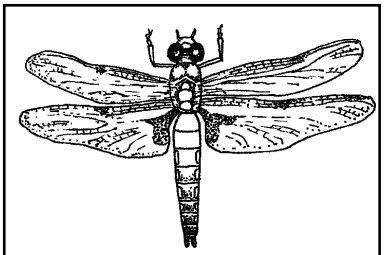
I fly using the wide flaps of skin that join my fingers.	I wag my tail up and down as I run or stand. I can fly well too.	I waddle a bit as I walk but can run quite fast.
I fly superbly at great speed and dive to catch my prey.	I crawl slowly on land but swim superbly using my tail.	When I'm young I slowly crawl or swim but as an adult I'm a strong flier.

Feeding

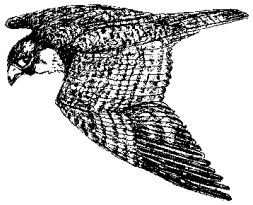
I love rabbits - I spot them from high above and swoop down to catch them in my talons.	As a youngster I catch my prey of water creatures by releasing my hinged jaws. In adulthood I catch insects as I fly using my front legs.	I love earthworms which I dig up with my strong claws but I also eat mice, frogs, fruit and nuts.
I enjoy flies and other insects.	I love tadpoles but also many other garden creepy-crawlies.	I feed on moths as I fly, finding them by echo-location.



meadow pipit

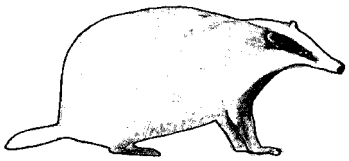


dragonfly



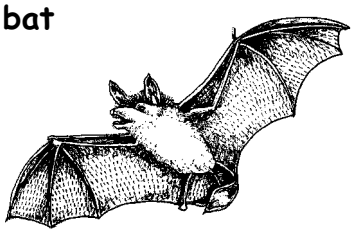
peregrine

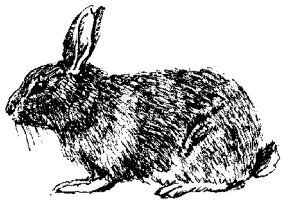
badger



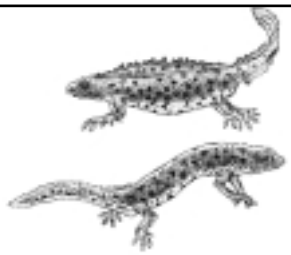
buzzard

bat

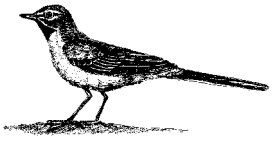




rabbit



great crested newt



pied wagtail

DESIGNED TO KILL!

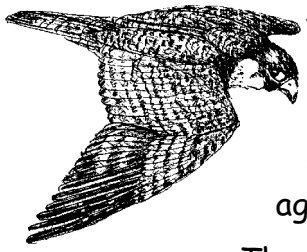
All these birds of prey are seen on Halkyn Mountain. They are expert hunters, well-adapted for capturing and killing their prey.

HE'S WATCHING YOU!

BUZZARDS are often seen wheeling overhead. Their broad powerful wings are suited for soaring for long periods on air currents. Their eyesight is acute for spotting prey many feet below.

SPEED KING!

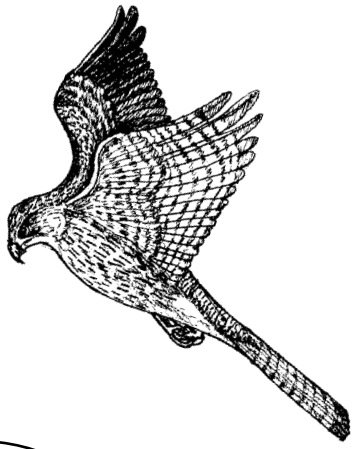
PEREGRINES are the fastest birds around. They catch their prey of smaller birds in the air, swooping down at speeds up to 180mph (290km/h) and knocking their prey out of the sky!

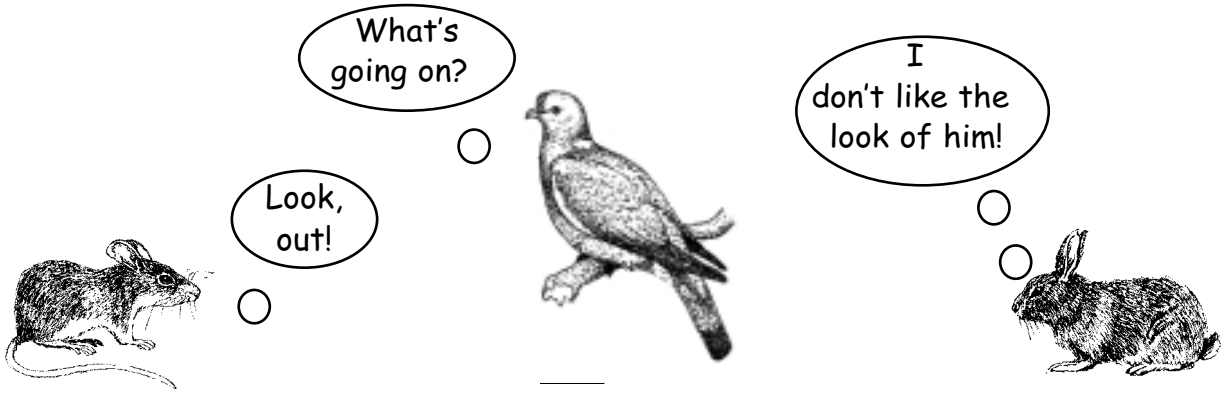


Their long pointed wings are designed for high speed pursuit of their prey. The wings snap back against the body when the peregrine dives for the kill. The birds are killed instantly with a blow from the peregrine's sharp talons.

HOVER STARS

KESTRELS are often seen hovering motionless overhead. Their long tail fans out to help hover on outstretched wings. The head remains still, focusing on a slight movement in the grass below that gives away the position of a mouse or vole. For its final pounce it half-closes its wings and drops onto its prey.





Why are these birds such good hunters?

Draw a bird of prey's beak

Draw a bird of prey's foot

How are their beaks and feet adapted for catching & tearing prey apart?

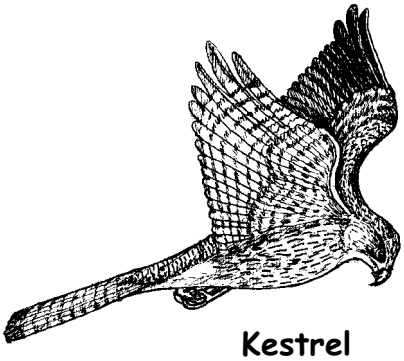
How do they find their prey?

Why can peregrines fly so fast?

What do kestrels use to balance as they hover?

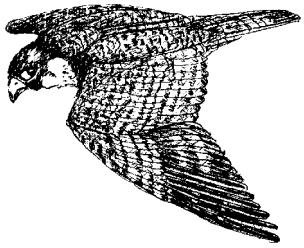
WHAT'S MY FAVOURITE FOOD?

Follow the tangled threads to find the favourite foods of these Halkyn birds of prey.

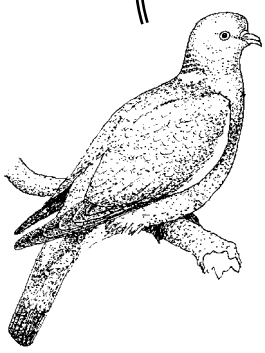


Kestrel

Buzzard



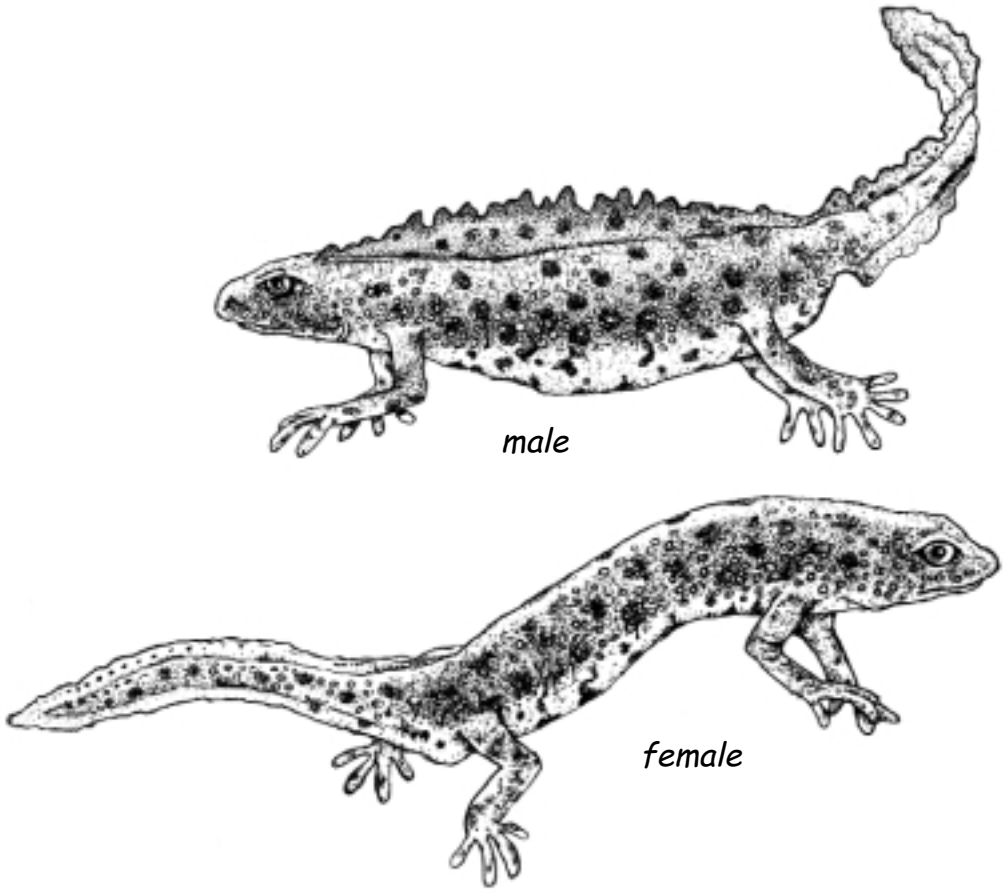
Peregrine



NEWT FACT FILE

There are three types of newt found on Halkyn:- **smooth, palmate** and **great crested**. The **great crested newt** is much bigger than the others, growing up to 16cm long. It has dark warty skin and its belly is usually orange or yellow with black splotches.

In Britain and Europe they are extremely rare although they are reasonably common on Halkyn. For this reason they are protected by law and you must not touch or disturb them.



Great crested newts

Newt life - true or false?

1. Newts live in water.

2. Newts are nocturnal.

3. Newts are herbivorous, feeding on garden plants.

4. It's against the law to touch any newt.

5. Newts hibernate during the winter.

6. Baby newts breathe through feathery gills on the sides of their head.

7. In spring some male newts develop very bright orange undersides and large crests and wave their tails about to attract a mate.

8. Female newts lay eggs covered in jelly like frogs and toads.

9. Great Crested Newts are poisonous.

Answers

1 .False: They live on land, in damp places for most of the year but go to ponds to breed.

2. True: Newts usually hide in the day and come out to find food at night.

3. False: Newts are carnivores, feeding on garden minibeasts, tadpoles and other small water creatures.

4. False: It's only Great Crested Newts that are protected by law. However, if you do catch Smooth or Palmate newts when pond-dipping always handle them carefully and always put them back where you found them.

5. True: Newts are cold-blooded so their body temperature changes with the temperature around them. Hibernation, where they are still and using little energy allows them to survive the cold winters.

6.True: Whereas adult newts breathe air, baby newts are fully aquatic and absorb their oxygen from the water.

7. True: All newts have similar courtship rituals.

8. False: Unlike frogs and toads, newts protect their eggs by wrapping each egg in a water plant leaf and sealing it up.

9. True: This acts as a warning to would-be predators

NEWT LIFECYCLE

Hibernate on land in a damp frost-free nook.

Return to the pond of their birth to breed.

Male newts display to attract a female. They lean and rock from side to side and fan and whip their tails near the female.

Females lay eggs singly, wrapped up in a leaf and sealed to stop them being eaten.

After 4 weeks the eggs hatch as tadpoles. They have frilly gills on their heads to get oxygen from the water.

Baby newts feed and grow in the pond. Their swimming improves and they feed on other small pond animals.

Their skin darkens and their gills disappear as they begin to breathe air.

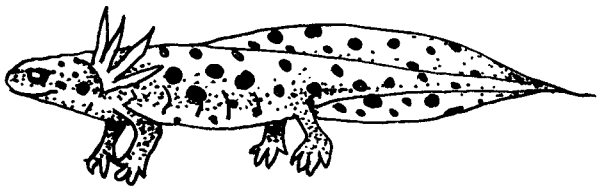
Young newts crawl out of the pond, feeding on insects and other minibeasts on the land, but also visit ponds to feed.

Stages in newt lifecycle

egg laid

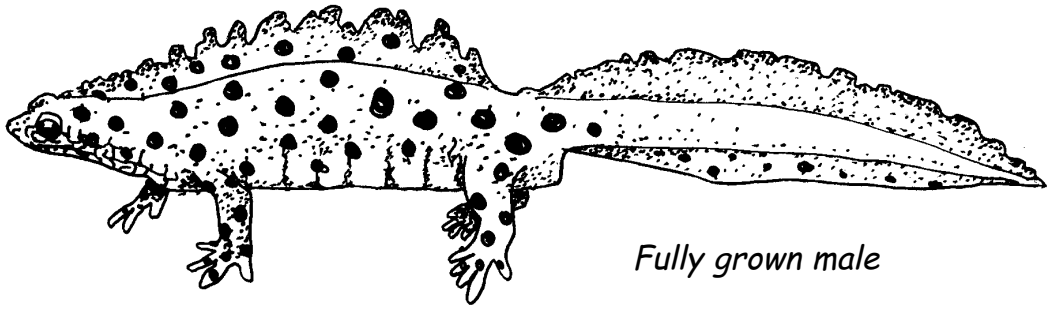
15 days

3 weeks

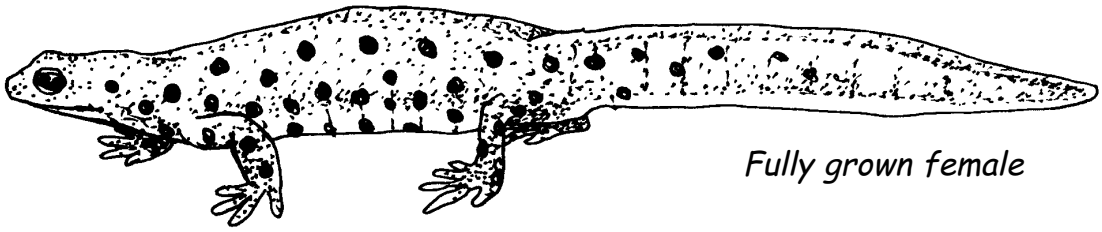


10 weeks

juvenile 18 weeks



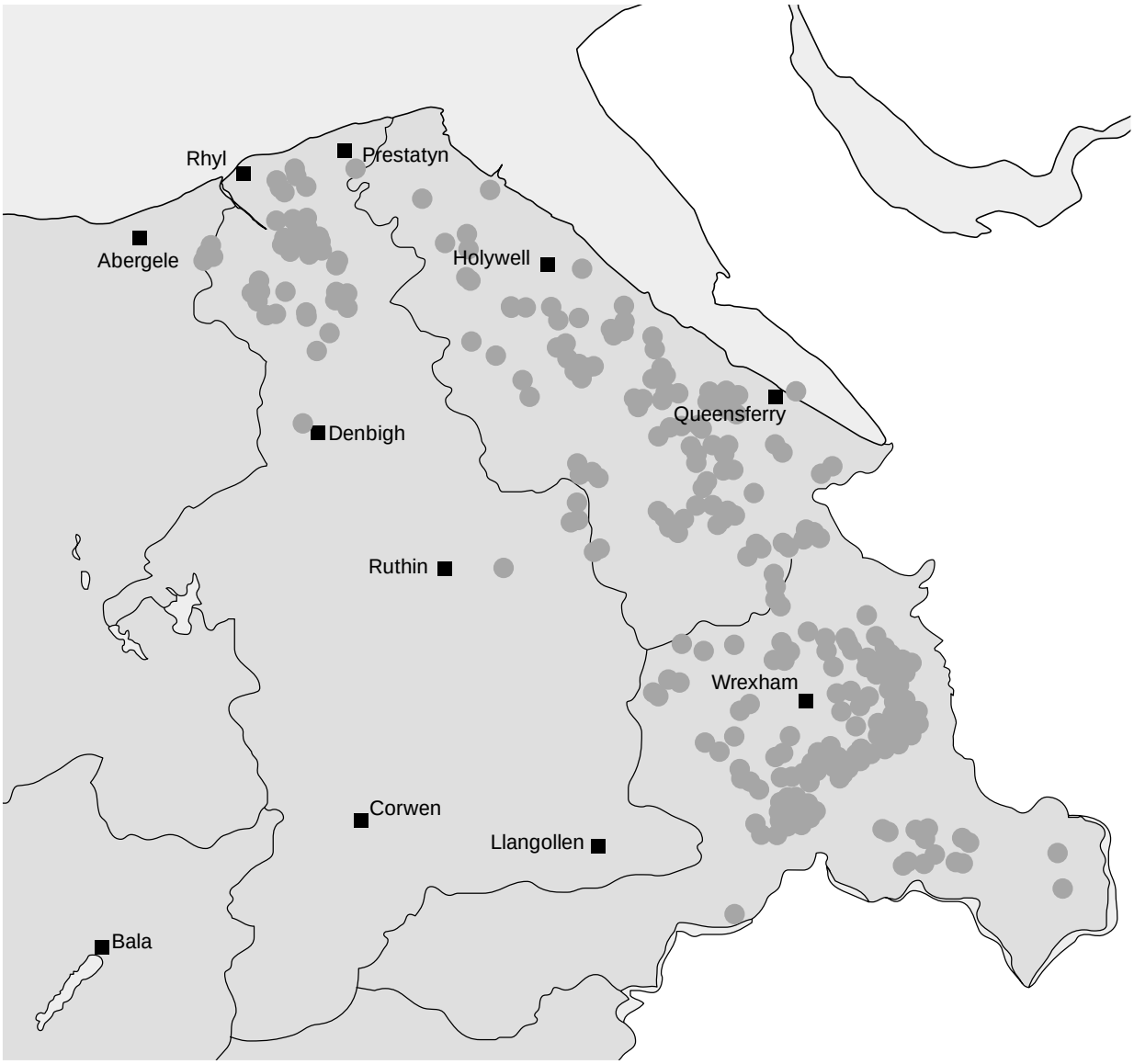
Fully grown male



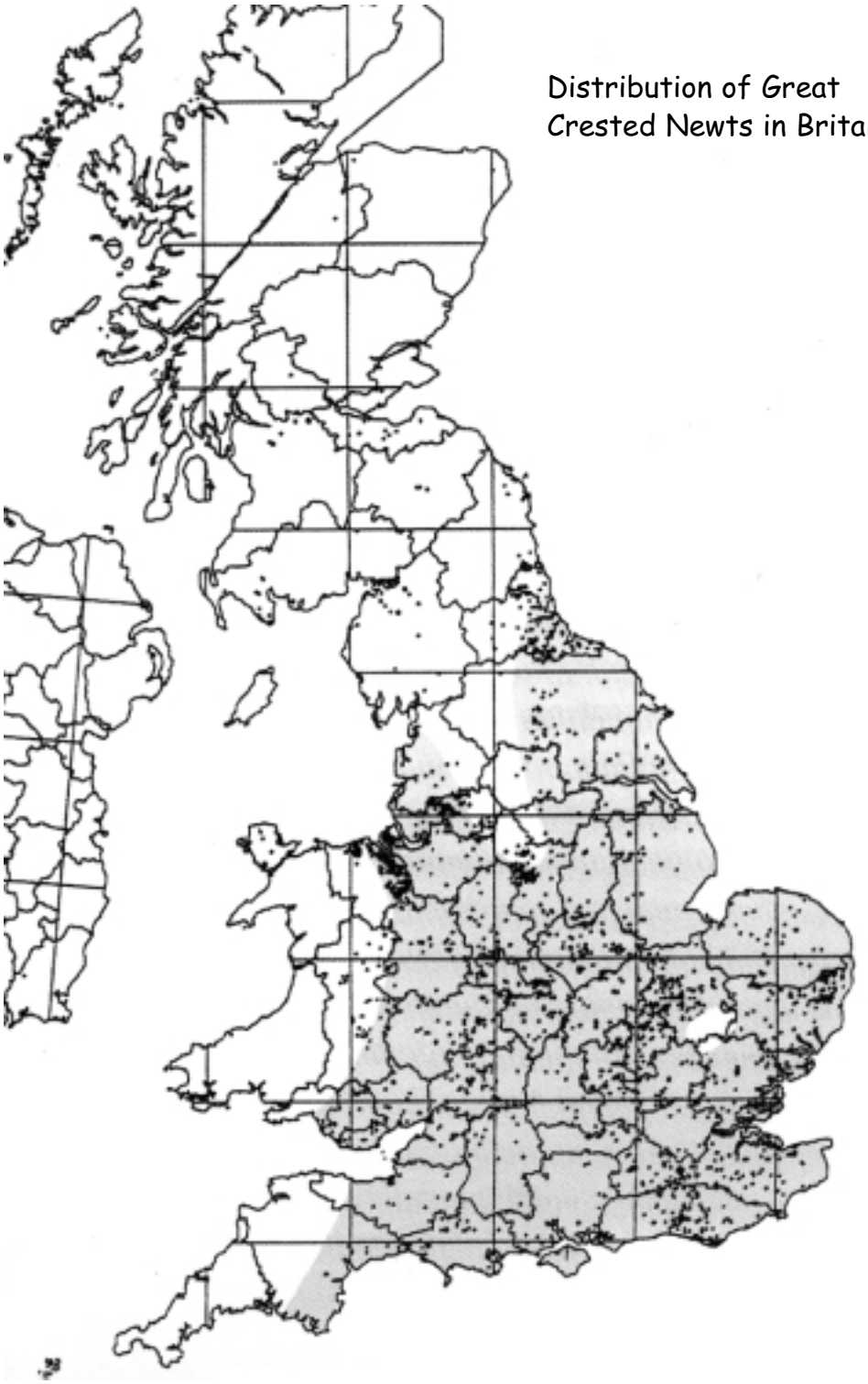
Fully grown female

Distribution of the Great Crested Newt

The numbers of Great Crested Newts in Britain and Europe are going down. Halkyn Mountain is one of the few places in Britain where they are relatively common.



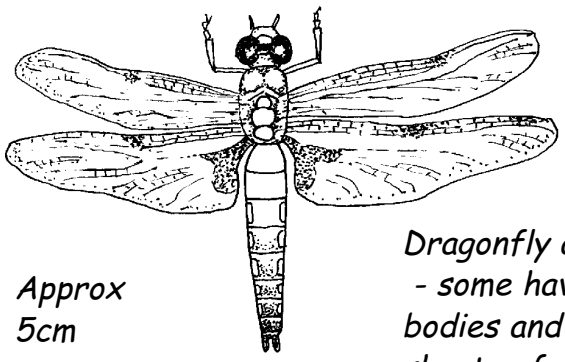
Distribution of Great Crested Newts in North East Wales.



Distribution of Great Crested Newts in Britain.

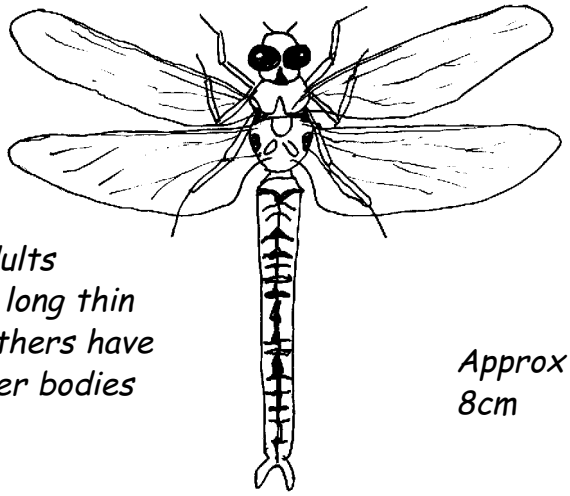
HALKYN'S DRAGONS!

Did you know that Halkyn has it's own sort of dragon? Dragonflies don't breathe fire and look very different from Welsh dragons. Look for them flying low over the ponds and boggy areas during the summer.



Approx 5cm

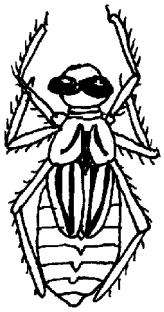
Dragonfly adults - some have long thin bodies and others have shorter fatter bodies

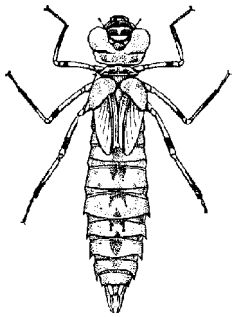


Approx 8cm

Dragonflies are large insects.

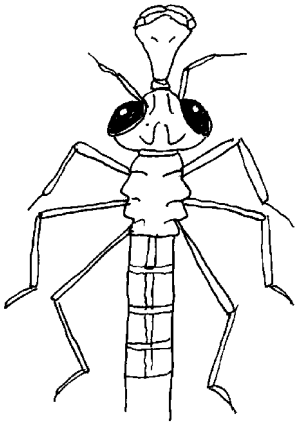
- they are often brightly coloured
- they hold their wings outstretched at rest
- they catch prey in flight using front legs
- they have huge eyes to see all around
- they lay eggs in water
- they fly fast - up to 35mph





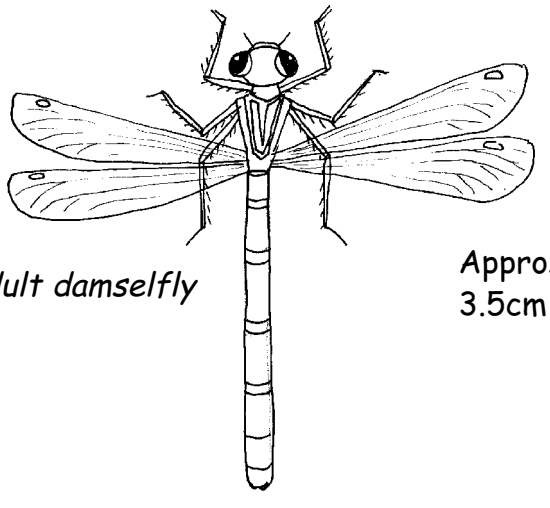
Young dragonflies are called nymphs.

- they live in water
- they have huge eyes to see all around
- they breathe through gills inside its body
- they shed their skin several times as they grow, gradually changing into an adult
- they feed on smaller pond animals, catching them with sharp jaws fitted to a hinged mask below their mouth that can shoot forwards very quickly!



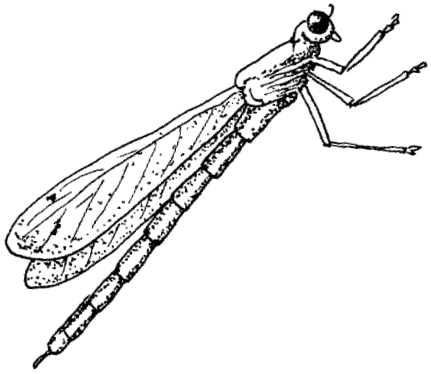
Hinged mask extended showing the sharp jaws

Damselflies are smaller and more delicate members of the dragonfly family



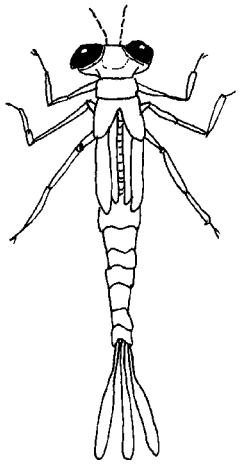
adult damselfly

Approx 3.5cm



Damselflies are smaller than dragonflies
- they have long thin bodies
- they are brightly coloured, often blue or red
- they hold their wings above them when resting
- they catch prey in flight using front legs
- they have huge eyes to see all around
- they lay eggs in water

Damselfly nymphs
- live in water
- feed on small pond animals
- huge huge eyes to see all around
- breathe through 3 gill plates at end of body
- sheds their skin several times as they grow, gradually changing into an adult



damselfly nymph

Spot the difference!

Similarities

Dragonflies	Damselflies

Differences

Dragonflies	Damselflies