

The Crown Estate Sustainability Initiative Food webs

You will learn to be able to build a model food web and consider how humans can affect the natural balance of ecosystems.



Reflecting on gameplay

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1. What can you remember about producers, prey, and predators?
2. What organisms did you meet? Which ones had you heard of?
3. Do you remember the job of the toad you met?
4. What do you think an ecologist does?



Identify the correct picture for each of these roles

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Predator

Prey

Producer

Primary consumer

Secondary consumer

Herbivore

Carnivore

Omnivore

A. Woodmouse



B. Fox



C. Grass

Correct answers:

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Predator **B**

Prey **A**

Producer **C**

Primary consumer **A**

Secondary consumer **B**

Herbivore **A**

Carnivore **B**

Omnivore **A & B**

A. Woodmouse



B. Fox



C. Grass

Can you pick the right roles for these examples?

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Predator

Prey

Producer

Primary consumer

Secondary consumer

Herbivore

Carnivore

Omnivore

A. Worm



C. Rabbit



D. Oak Tree



B. Badger



E. Blackberry



G. Owl



M. Roe Deer



F. Caterpillar



N. Woodpigeon



I. Squirrel



H. Grasshopper



J. Vole



K. Hedgehog



L. Blackbird



Correct answers:

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Predator B, G, K

Prey A, C, F, H, I, J, K, L

Producer D, E

Primary consumer A, C, F, H, I, J, M, K, L, N

Secondary consumer B, G

Herbivore C, F, H, I, J, M

Carnivore G

Omnivore B, K, N, L

A. Worm



C. Rabbit



D. Oak Tree



B. Badger



E. Blackberry



M. Roe Deer



F. Caterpillar



G. Owl



N. Woodpigeon



L. Blackbird



K. Hedgehog



J. Vole



I. Squirrel



H. Grasshopper



Energy flow

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Grass



Woodmouse



Fox

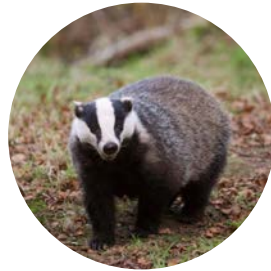
The arrows demonstrate the flow of energy through the food chain. It shows that the fox ate the wood mouse and the wood mouse ate the grass, so the energy is transferred.



Scientists called **ecologists** study the relationship between living things and their **habitats**. They also observe how human activity affects the natural balance of **ecosystems**.

Many food chains form complex food webs 8

Secondary
consumers



Primary
consumers



Primary
producers



Food webs

Make a food web for the organisms in the pond.

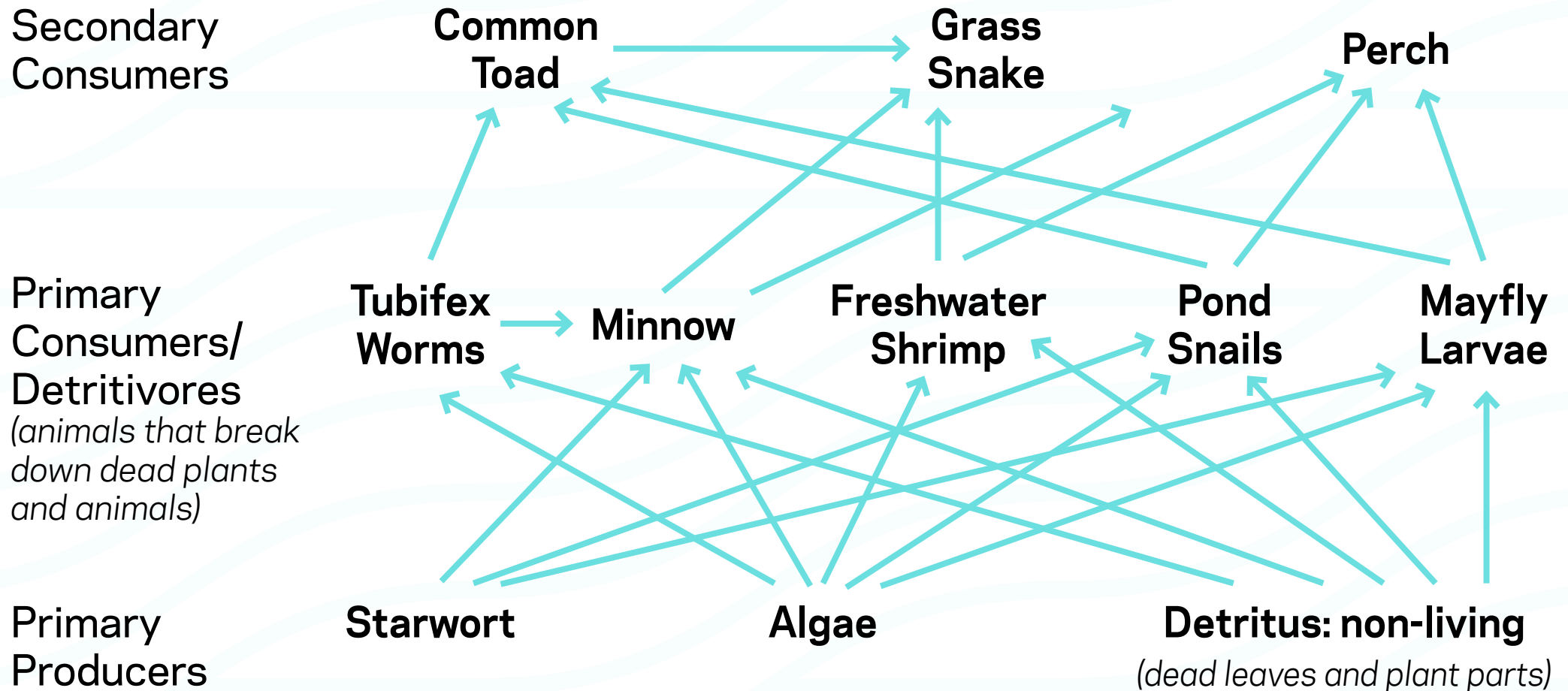
Arrange the cards using the headings on your worksheet.
Draw arrows to show the direction of energy movement.



'Detritus' is included in the food web model. It is not a living organism but it comes from living organisms - it is on the bottom of the pond and is made up of leaves and plant parts; animal remains, waste products and other organic debris, broken down by bacteria and fungi.

It is eaten by **freshwater shrimp, pond snails, and tubifex worms.**

Your food web should look something like this ¹⁰



Pollution

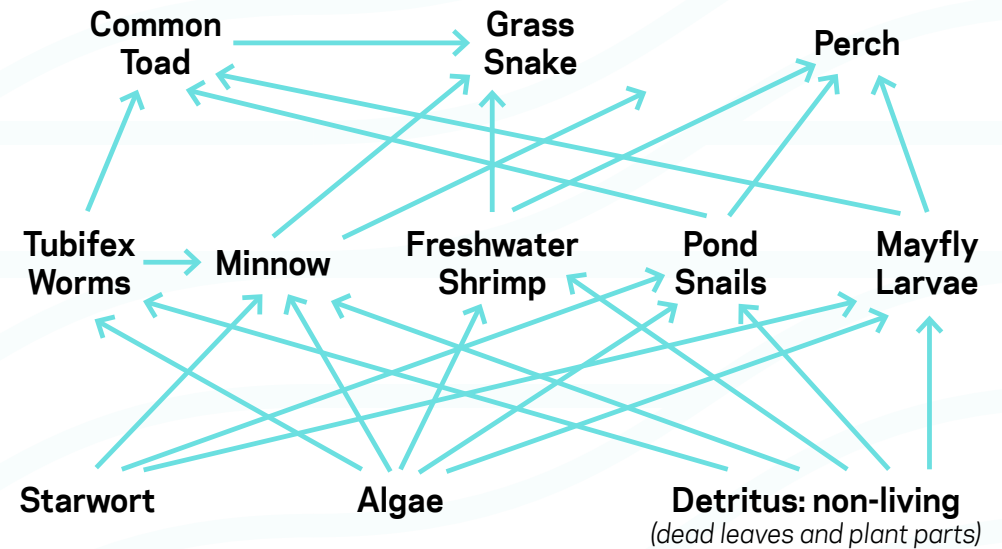
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Secondary
Consumers

Primary
Consumers/
Detritivores
(animals that break
down dead plants
and animals)

Primary
Producers



What would happen to the food web if:
All of the starwort died as an algal bloom
caused by agricultural pollution covered
the top of the pond and cut out the light?

Pollution

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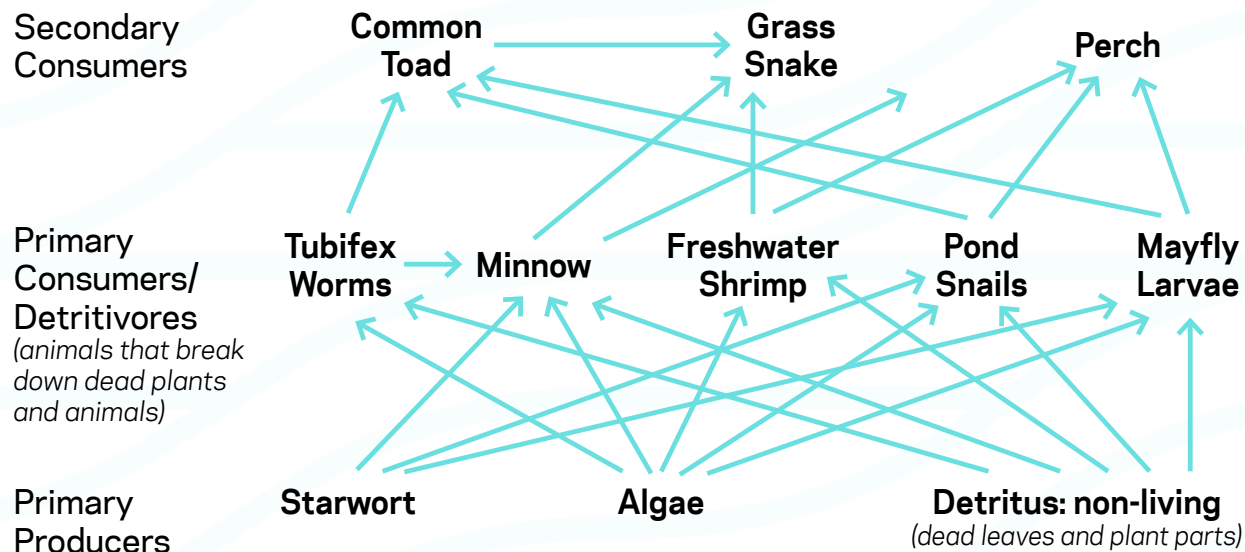


The death of starwort affects the primary consumers, e.g. the minnow, but not to a high extent because all the primary consumers can also eat algae and detritus, so their numbers will not decrease. The whole food web is impacted to a low extent.

However, if the algae consumes most of the oxygen then all the primary and secondary consumers will be impacted to a high extent, as they need oxygen in the water. They will all have reduced numbers and there will be low biodiversity.

Pond snails

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What would happen to the food web if:
All of the pond snails have died as a result of disease caused by unusually hot weather which could be the result of global warming?



Pond snails

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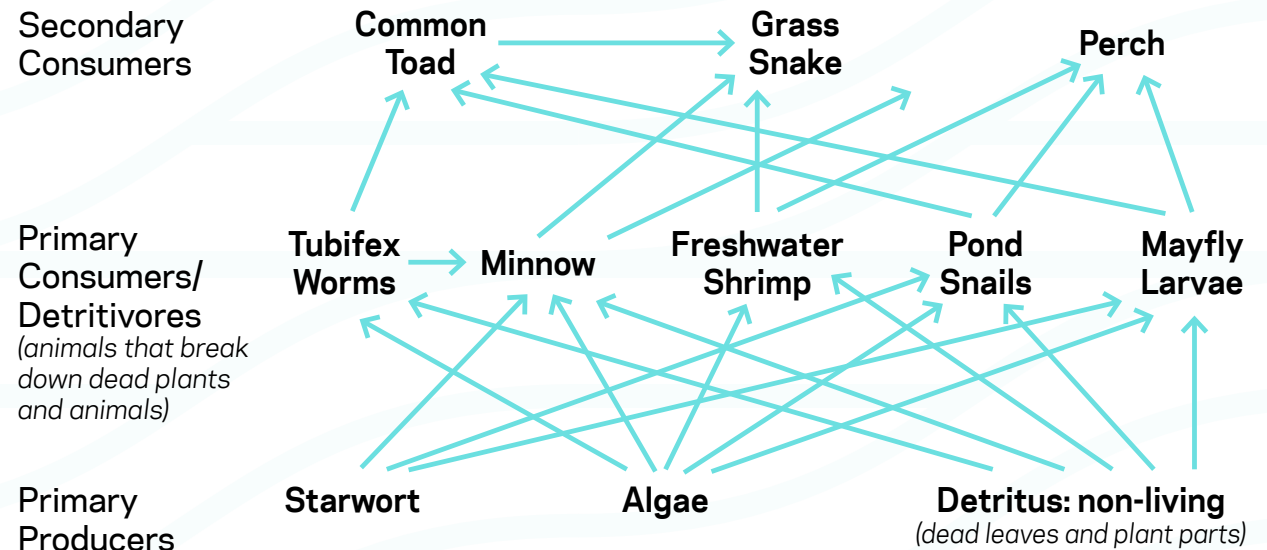
The death of pond snails affects perch and the common toad as they consume pond snails, their numbers may decrease. The perch will consume more shrimp, so their numbers may decrease.

Detritus, algae and starwort numbers may increase as pond snails are not eating them. Overall, the food web is impacted to a low extent, there are other primary consumers that the secondary consumers can eat, so biodiversity remains high.



Perch

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What would happen to the food web if:
All of the perch have been removed by overly enthusiastic fishing?

Perch

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A reduced number of perch affects most of the primary consumers that perch consumes, such as mayfly larvae and pond snails.

Their numbers will increase but they have other consumers, such as the common toad, so their numbers may also increase.

Ponds need protection

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Ponds need protection as they can host a huge range of biodiversity and a high water quality is crucial but they are very sensitive to disruption.



Reflection

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- What was the most interesting thing you learned today?
- Did anything you learned surprise you?
- What jobs do you think have the biggest impact on ecosystems and the organisms in them?
- How could people doing these jobs protect ecosystems?

Conduct a SWOT analysis on a pond

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Complete the worksheet.

1. Strengths

Hint

What are the positive aspects of the wildlife pond?

Think about humans and other living organisms e.g. 'high biodiversity' (lots of different plants and animals).

2. Weaknesses

Hint

What are the disadvantages of the wildlife pond?

Think about safety and water pollution.

3. Opportunities

Hint

How could a pond enhance an area for people and the environment? Could conservation bring benefits? e.g. wellbeing.

4. Threats

Hint

What harm could come to the wildlife in the pond? Think about how humans can disrupt the balance (e.g. farming, fishing and climate change).