

Grade 9 Ecosystems

Simulation Materials

Development Rules 1

Governments have to set rules for development and environmental protection in their jurisdiction. In this scenario the government wants to set aside about 10% of the land for protected status and is allowing 50% of the land to be developed. The rest of the land may be for agricultural, forestry, etc.

This means:

- 10 squares need to be protected
- 50 squares can be developed
 - 20 for industrial use
 - 30 for residential use

Development Rules 2

Sometimes governments decide to put more emphasis on development over preserving natural lands. In this scenario the government wants to set aside only 5% of the land for protected status and is allowing 70% of the land to be developed. The rest of the land may be for agricultural, forestry use, etc.

This means:

- 5 squares need to be protected
- 70 squares can be developed
 - 30 for industrial use
 - 40 for residential use

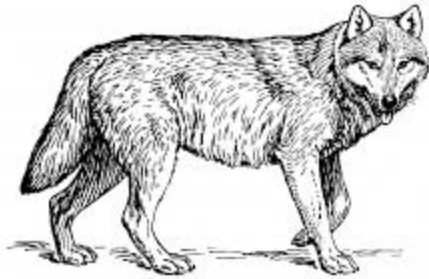
Development Rules 3

A new government has been elected with a promise to protect more land, especially as climate change becomes more serious. In this scenario the government wants to set aside about 30% of the land for protected status and is allowing 30% of the land to be developed. The rest of the land may be for agricultural, forestry, etc.

This means:

- 30 squares need to be protected
- 30 squares can be developed
 - 10 for industrial use
 - 20 for residential use

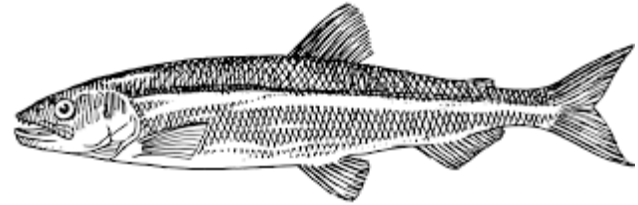
Wolf



One wolf needs **six areas of 5 or more connected squares of woods or fields.**

How many wolves can survive in your model ecosystem?

Trout



One trout needs **5 squares** of water.
How trout can survive in your model ecosystem?

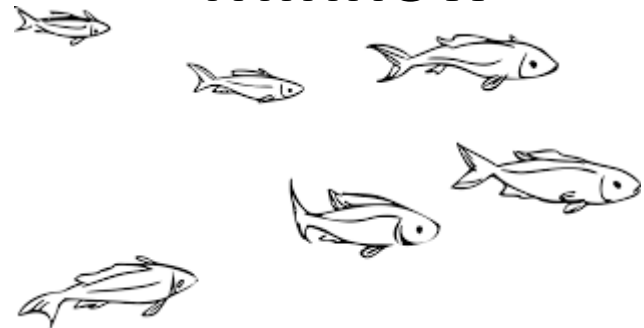
Raccoon



One raccoon needs **5 squares** of any land space (undeveloped or developed).

How many raccoons can survive in your model ecosystem?

Minnow



One minnow needs **1 square** of water.

How many minnows can survive in your model ecosystem?

Fox



One fox needs **5 squares of protected forest.**

How many foxes can survive in your model ecosystem?

Blue Jay



One blue jay needs **3 squares of forest, fields or wetlands.**

How many blue jays can survive in your model ecosystem?

Eagle



One eagle needs **20 squares of protected squares.**

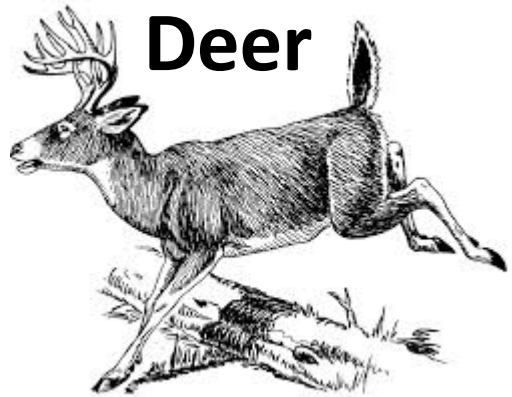
How many eagles can survive in your model ecosystem?

Squirrel



One squirrel needs **2 squares of any undeveloped forest or field space.**

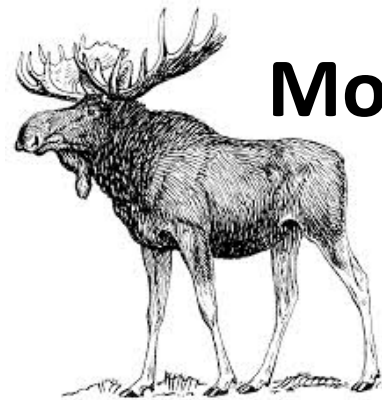
How many squirrels can survive in your model ecosystem?



Deer

One deer needs **one area of more than 5 connected forest squares**.

How many deer can survive in your model ecosystem?



Moose

One moose needs **two areas of 5 connected forest squares**.

How many moose can survive in your model ecosystem?



Loon

One loon needs **5 squares of protected water**.

How many loons can survive in your model ecosystem?



Beaver

One beaver needs **5 squares of connected wetland**.

How many beavers can survive in your model ecosystem?

Frog



One frog needs **1 square of protected wetland.**

How many frogs can survive in your model ecosystem?

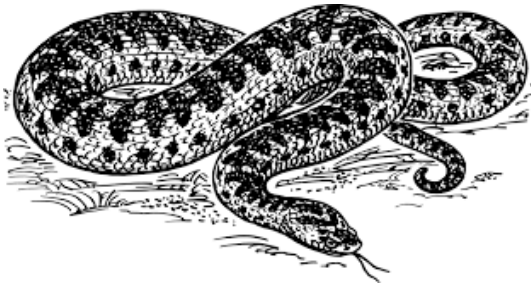
Chipmunk



One chippy needs **4 squares of forest or fields.**

How many can survive in your model ecosystem?

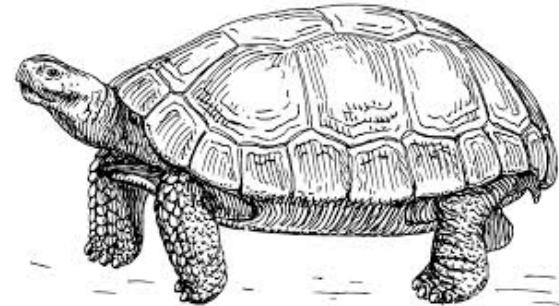
Snake



One snake needs **5 connected squares of fields OR 2 squares of protected fields.**

How many snakes can survive in your model ecosystem?

Turtle



One turtle needs **5 connected squares of wetlands OR 1 square of protected wetland.**

How many turtles can survive in your model ecosystem?

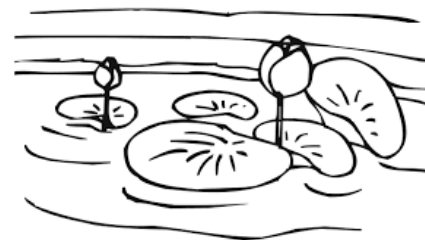
Native Wildflowers



Native wildflowers can thrive **in any protected fields.**

How many squares can you find native wildflowers in?

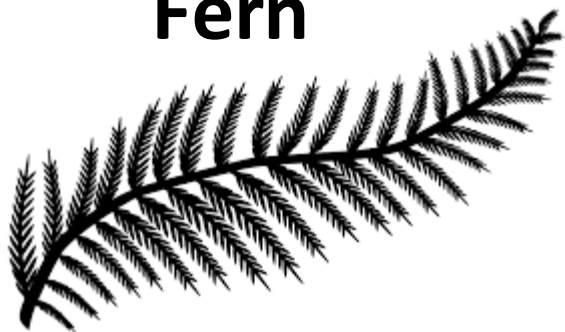
The water



Healthy water requires a balance between development and protected areas.

Do you feel your scenario provides balance?

Fern



Ferns will thrive in any protected forest.

How many squares can you find ferns in?

The soil

Many life forms, including humans, need unpolluted soil in their ecosystem. Excessive industrial activity can lead to soil pollution.

Do you feel your scenario is likely to have unpolluted soil?



Farmer



Farmers need **unprotected and undeveloped fields.**

How are farmers doing in your scenario?

Hunter



Hunters need **unprotected and undeveloped forests.**

How are hunters doing in your scenario?

Camper



Campers take advantage of having access to **protected lands (forests and fields).**

Are campers likely to be happy with your scenario?

Dog walker



Dog walkers are welcome in unprotected and undeveloped land (forests and fields).

Are dog walkers likely to be happy with your scenario?