**ACTIVITY: Biodiversity battleships**

**Activity idea**

In this activity, students play a version of battleships that explores what happens to flora and fauna when habitat is lost.

By the end of this activity, students should be able to:

* know about the flora and fauna in a variety of New Zealand habitats
* know some Māori names for native flora and fauna
* be aware of the extent of the loss of the New Zealand habitat, both before and after European settlement.

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**Introduction/background**

The article [Biodiversity](http://link.sciencelearn.org.nz/resources/1454-biodiversity) introduces this topic in a New Zealand context.

In this activity, groups draw and place flora and fauna from a particular habitat on a map grid. Pairs of groups then play battleships to identify the extent of loss of the New Zealand habitat, before and after European settlement.

By the end of the activity, each group will have a habitat that has been reduced to separate patches on their game grid. This is similar to many New Zealand habitats, most obviously bush, which is patchy and no longer has continuity.

**What you need**

* One [habitat card](#habitat) per group (laminate if you intend reusing)
* One sheet of [species cards](#species) per group
* One [habitat grid](#grid) per group (laminate if you intend reusing)
* Books/website resources with information about native New Zealand plants and animals
* Crayons and coloured pencils
* Paper (white and coloured)
* Scissors

**What to do**

1. Divide the class into an even number of small groups and give each group a [habitat card](#habitat).
2. Have each group research the plants and animals on their habitat card and become familiar with the English and Māori names. They need to draw each of the species onto the small species cards, so they must think about how to make each animal/plant recognisable from similar ones. They could make a key in which each picture has its name next to it. If you are short of time, just use the names rather than pictures, but it would still be useful to find out about the species.
3. Each group should set out all their species cards on the [habitat grid](#grid). All squares must be covered – there will be more than one item on some squares. This represents the habitat before any humans arrived in New Zealand.
4. Working with another group, without seeing each other’s grid, take turns to call out grid co-ordinates. When a grid co-ordinate is called out, the other group has to ‘destroy’ that square on their grid by covering it with a square of coloured paper.
5. Take a total of nine turns each – 30% of the grid will be destroyed (covered in coloured paper), which represents the loss of habitat before European settlement.
6. Discuss as a class what has happened to the plants and animals in each habitat.
7. Take nine more turns each – 60% of the grid will be destroyed. This represents loss of habitat into the period after European settlement.
8. Discuss as a class what has happened to the plants and animals in each habitat.
* Which species are highly reduced in numbers?
* Have any species become extinct?
* Were any species unaffected?

**Discussion questions**

* What effects does this patchiness have on the flora and fauna in the remaining areas? (Reduced gene pool, makes it more susceptible to predation.)
* What can we do to offset this effect? (Plant native corridors – native planting in gardens so that birds and seeds can move from one place to another easily.)

**Extension ideas**

This activity lends itself to students exploring different perspectives – education in, about and for the environment.

***In the environment***

* A field trip could be incorporated taking students to an area of remaining forest, for example, a local nature reserve or wetland remnant.

***About the environment***

* As part of preparing for this activity, students are required to find out about flora and fauna using various references. Students can be encouraged to take a bit of extra time to find out a few more things about each thing they draw.
* Through asking key questions, information that students already have can be built on to help them form additional knowledge about the series of events that have led to the drastic reduction in New Zealand’s native flora and fauna and the impact that this has had.
* Students could find the European and/or botanical names for the flora and fauna on the particular habitat card used or develop their own mini native plant ID hunt or matching activity.

***For the environment***

* Students could help to save a vulnerable, rare or endangered species. This could take the form of helping to protect the habitat of the species or writing letters to politicians.
* Students could be involved in native planting around their homes or as part of a school project, working towards creating native corridors.

**Coastal habitat**

|  |  |
| --- | --- |
| **FAUNA** | **FLORA** |
|  | **How many?** |  | **How many?** |
| gull/tara | 8 | pōhutukawa | 8 |
| katipō | 2 | flax/harakeke  | 10 |
| shag/kawau | 2 | golden sand sedge/pīngao | 5 |
| kingfisher/kōtare | 4 | tussock/toetoe | 8 |
| oystercatcher/tōrea | 10 |  |  |

**Forest habitat**

|  |  |
| --- | --- |
| **FAUNA** | **FLORA** |
|  | **How many?** |  | **How many?** |
| blue duck/whio | 4 | pepper tree/horopito | 5 |
| kiwi | 4 | tōtara | 12 |
| kākāpō | 2 | karaka | 7 |
| wood pigeon/kererū | 6 | black tree fern/mamaku | 5 |
| fantail/pīwakawaka | 10 | kōwhai | 8 |
| tūī | 10 | red pine/rimu | 9 |
| kōkako | 4 | rough tree fern/whekī | 5 |

**Marsh/lowland habitat**

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| --- | --- |
| **FAUNA** | **FLORA** |
|  | **How many?** |  | **How many?** |
| pūkeko | 10 | flax/harakeke | 15 |
| wood pigeon/kererū | 4 | kōwhai | 6 |
| fantail/pīwakawaka | 10 | white pine/kahikatea | 10 |
| tūī | 9 | black tree fern/mamaku | 5 |
| kōkako | 3 | nīkau | 8 |
|  |  | tussock/toetoe | 10 |
|  |  | rough tree fern/whekī | 5 |

**Alpine/subalpine habitat**

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| --- | --- |
| **FAUNA** | **FLORA** |
|  | **How many?** |  | **How many?** |
| New Zealand falcon/kārearea | 1 | red tussock | 12 |
| kea | 4 | silver beech/tawhai | 7 |
| stichbird/hihi | 4 | cotton daisy/tikumu | 5 |
| long-tailed cuckoo/ koekoeā | 2 | grass tree/inanga | 5 |
|  |  | pepper tree/horopito | 4 |
|  |  | koromiko | 5 |

**Species cards**

Draw each animal or plant in one of these squares. You need to draw several cards for some species – the number is on your habitat card. When you have finished, cut the cards out carefully along the lines.

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**Habitat grid**

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| --- | --- | --- | --- | --- | --- | --- |
|  | **A** | **B** | **C** | **D** | **E** | **F** |
| **1** |  |  |  |  |  |  |
| **2** |  |  |  |  |  |  |
| **3** |  |  |  |  |  |  |
| **4** |  |  |  |  |  |  |
| **5** |  |  |  |  |  |  |