

Small Populations

OBJECTIVES

- ❖ Students gain understanding of consequences from threats to biodiversity
- ❖ Students develop knowledge of small populations
- ❖ Students become engaged in activities dealing with population biology
- ❖ Students form connections between biodiversity, threats and small populations
- ❖ Students describe actions that may be taken to conserve small populations

SKILLS

Critical Thinking	Analytical Thinking	Role Playing	Reflective Analysis
Comparison	Team Work	Decision Making	Active Listening

KNOWLEDGE AND VALUES DEVELOPED

- ❖ Roles that threats to biodiversity play in conservation
- ❖ Human, animal and plant interactions
- ❖ Genetic consequences of small populations
- ❖ Responsibility of humans towards their surroundings

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Activity 1

Students will be given a copy of The Recovery Plan for *Kokia cookei* and asked to read it. After reading the handout students will be prompted to answer several questions (see list below). When they have finished answering questions we will begin a group discussion on their reading. **Be prepared to share your answers with the group! You will have 10 minutes to complete this activity.**

Please Answer the Following Questions After You Finish Reading "The Recovery Plan for *Kokia cookei*".

- 1) On which island did Koki`o originally grow?
- 2) When was the species wiped out?
- 3) How many Koki`o trees grew before they were wiped out?
- 4) How many individual plants grow now?
- 5) What factors caused decline and eventual extinction in the wild?
- 6) Did any native animals depend on Koki`o? Explain your answer.
- 7) List the types of propagation used to try to conserve this species?
- 8) Is Koki`o an important species, why or why not?
- 9) Does it matter if Koki`o goes totally extinct? Explain.

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Activity 2

The science partner will illustrate concepts of population biology and small populations using a flip chart. During the illustration explanation will be given for components of the drawing with reference to a vocabulary list provided below. The illustrations will be posted for the remainder of the day. These illustrations may be taken to the classroom and posted. Students will participate in activities that focus on words and concepts of population biology after the vocabulary list has been reviewed and any questions answered.

Vocabulary List

Chromosome - thread-like, gene carrying bodies in the cell nucleus. Chromosomes are composed primarily of DNA and proteins.

DNA - (deoxyribonucleic acid) a large organic molecule that stores the genetic code. DNA is composed of sugars, phosphates and bases arranged in a double helix shaped structure. Segments of DNA in chromosomes correspond to specific genes.

Evolution - Genetic change in a population of organisms that occurs over time. The term is also frequently used to refer to the appearance of a new species.

Gene flow - The transfer of genes from one population to another. The loss or addition of individuals can easily change the gene pool of both recipient and donor populations. In other words these population scan evolve.

Gene pool - All of the genes in all of the individuals in a breeding population. More precisely it is the collective genotype of a population.

Genes - Units of inheritance usually occurring at specific locations, or loci, on a chromosome. Physically, a gene is a sequence of DNA bases. A gene may be made up of hundreds of thousands of DNA bases. Genes are responsible for hereditary characteristics in plants or animals.

Genotype - The genetic makeup of an individual.

Phenotype - The observable or detectable characteristics of an organism; the detectable expression of a genotype.

Population - An assembly of the same species in a particular geographic location.

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Activity 3


Word Jumble

In this activity you will be given a series of words that have been spelled incorrectly. Each word comes from previous activities completed up to this point. You are encouraged to use previous vocabulary lists, articles or activities to help you out. Your task is to figure out what each word is and spell it correctly. After you have figured out what the word is place the letters in the boxes provided. Note that one letter from each group of boxes will be circled. Place the circled letter on the dashed lines below to answer the question on the following page.


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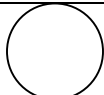
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What do we do to protect native plants?

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Activity 3

For the second part of Activity 3, students select three words from the previous vocabulary list and create illustrations for each word. Use the space below for your illustrations. **Be prepared to share you ideas with others.**

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Activity 4

Recovery Plan

Students select an endangered Hawaiian plant and create their own recovery plan for the species they selected. Students may wish to include information on the plant's habitat and distribution, its recovery status (endangered, threatened or rare) and actions they would take to assist in recovery. Students may work in teams. Groups share their recovery plans when finished. The following web sites may be useful:

<http://endangered.fws.gov/>

<http://www.mobot.org/CPC/>

<http://www.botany.hawaii.edu/faculty/carr/natives.htm>

<http://hbs.bishopmuseum.org/endangered/endangered.html>

<http://pdcs.ctahr.hawaii.edu:591/hawnprop/default.htm>

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