

Diversity at Risk

The United Nations declared 2010 the International Year of Biodiversity. The United Nations hoped to draw attention to the threats to Earth's biodiversity and to create opportunities for increasing people's understanding of the vital role biodiversity plays in sustaining life on Earth.

Biodiversity is vital for supporting the living systems that provide us with our food, fuel, health, and wealth. Human activity is now seriously threatening biodiversity, resulting in the irreversible loss of species and potentially irreparable damage to ecosystems.

In this Unit Task you will select a group of living organisms and examine the roles they play in supporting ecosystems. You will investigate specific threats to their diversity by examining how human actions are influencing the group in negative and positive ways.

Purpose

To investigate the current status of a selected group of organisms, examine how their diversity supports ecosystems, assess any threats to their diversity, and research any actions being taken to protect them

Procedure

Part A: Select and Assess a Group


1. First select a particular *phylogenetic group* of organisms. You can select a large or a small group. You may also limit your investigation to a particular region. For example, you could study flowering plants of Ontario, Arctic whale species, or all wild members of the Felidae (the cat family). Get approval from your teacher before continuing.
2. Research your chosen group and compile information about the following:
 - (a) The basic biology of the group: Describe the unifying characteristics of the group. Include a labelled diagram of a representative species and a description of its life cycle.
 - (b) The diversity of the group: Describe the estimated number of species, the range of ecosystems they inhabit, and the diversity of characteristics within the group, and include a phylogenetic tree of the group.

- (c) The roles of the group in supporting ecosystems. Describe their ecological niches and ways in which other species are dependent on them.
3. If possible, directly observe and document members of the group (**Figure 1**). You may have members of the group in your local environment or on display in zoos or natural history museums. If you cannot observe members of the group directly, use the Internet and other sources to view still and video images of them.



Figure 1 Barn owls are endangered in Ontario and throughout Canada.

Part B: Assess the Group's "At Risk" Status

4. Use the Internet and other available resources to assess the current status of your group. Do all species within the group have healthy populations, or are some or all of them at risk? 

- Describe threats to members of the group. If there are many threats, provide an assessment of the ones you think are most important (**Figure 2**). Are the threats increasing or decreasing?

Note: the International Union for the Conservation of Nature (IUCN) Red List of Threatened Species is the most comprehensive global database for this information.



Figure 2 (a) Habitat destruction is a negative way that humans affect biodiversity. (b) Conservation efforts, such as the use of boardwalks, can reduce human impact on ecosystems and protect biodiversity.

Part C: Conservation in Action

- Find out what actions are being taken by organizations to help protect the entire group or individual species. Evaluate these actions. Are they effective? Can these organizations have a significant long-term impact on the future of the group?
- Describe ways that individuals can become involved in protecting the diversity of the group.
- Use the Internet and other sources to learn about the International Convention of Biological Diversity and the Youth Accord for Biodiversity. Who was involved? What were their objectives?

Analyze and Evaluate

- Prepare a report of your investigations and findings. Your report can be divided into the following components:
 - Abstract:** a short, one-paragraph summary of the entire investigation
 - Introduction:** a brief overview of the importance of diversity in general to the health of ecosystems
 - Parts A to C:** sections corresponding to the parts of the procedure
 - Discussion:** concluding remarks that include your assessment of the importance and status of your group and their long-term outlook, as well as some thoughts on the global status of biodiversity T/I C A

Apply and Extend

- Exchange reports with several classmates and read theirs.
 - Compare the threats to your group with those to other groups. Suggest reasons for the similarities and differences. T/I C A
 - Were the same organizations involved in protecting more than one group of organisms? K/U
 - Did the major conservation organizations you researched spend most of their efforts on the protection of specific groups, specific species, or specific habitats? Why do you think they made these choices? T/I A



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ASSESSMENT CHECKLIST

Your completed Performance Task will be assessed using the following criteria:

Knowledge/Understanding

- ✓ your understanding of the unifying characteristics of your group
- ✓ your depiction of the life cycle of your representative species
- ✓ your understanding of the ecological relationships between species in your group and other organisms

Thinking/Investigation

- ✓ your ability to find and select relevant information
- ✓ your ability to synthesize information from a variety of sources
- ✓ your ability to evaluate the accuracy and currency of information from various sources
- ✓ the evidence on which you judge the threats to the group

Communication

- ✓ the organization and clarity of the information in your final report
- ✓ the effectiveness of your written presentation
- ✓ your use of appropriate visuals to support your findings and conclusions

Application

- ✓ the quality of your assessment of the threats to your group and of conservation efforts and options
- ✓ your understanding of the importance of biodiversity in supporting the sustainability of ecosystems