

# ENDANGERED SPECIES CURRICULUM

## GRADES 5 – 12

### Focus on an Endangered Species/Region

(<http://www.fieldtripearth.org/strategy.xml?id=37>)

Students develop an integrated project through the comprehensive study of a species, a region, or both. This long-term project requires students to explore fiction, history, cultural attitudes, and government. The scientific data students can collect and analyze may include GIS information, climate and weather, satellite tracking/mapping, and observations from research scientists' journals. This lesson is best suited for grades 5-12 and adheres to National Science Education Standards.

### Context

Students develop an integrated project through the comprehensive study of a species, a region, or both. This long-term project requires students to explore fiction, history, cultural attitudes, and government. The scientific data students can collect and analyze may include GIS information, climate and weather, satellite tracking/mapping, and observations from research scientists' journals.

The final product may take the form of conservation or action plans since the focus of the study will be on endangerment and the human effect on a species/region.

This strategy provides numerous activities that can be used separately or joined together as a long-term unit to study an endangered species/region.

### Curriculum

*Standards for the English Language Arts*

Sponsored by NCTE and IRA (<http://http://www.ncte.org/about/over/standards>)

7. Students conduct research on issues and interests by generating ideas and questions, and by posing problems. They gather, evaluate, and synthesize data from a variety of sources (*e.g.*, print and non-print texts, artifacts, people) to communicate their discoveries in ways that suit their purpose and audience.

8. Students use a variety of technological and information resources (*e.g.*, libraries, databases, computer networks, video) to gather and synthesize information and to create and communicate knowledge.

12. Students use spoken, written, and visual language to accomplish their own purposes (*e.g.*, for learning, enjoyment, persuasion, and the exchange of information).

### The National Science Education Standards

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6.3 Life Science Standards

Levels 5-8: Structure and function of living systems; Reproduction and heredity; Regulation and behavior; Populations and ecosystems; Diversity and adaptations of organisms.

Levels 9-12: Interdependence of organisms and Behavior of organisms.

### **Attachments**

None

### **Other materials**

The materials needed depend upon the activities (or combination of activities) listed below. This is a basic list of materials that could be used with the activities:

1. Reference materials (especially reference materials about endangered species)--These materials are needed to find information about the species, the people of the region, conservation efforts, population data, etc. This could include material from the internet. Students could select an animal on the Field Trip Earth site and take a virtual field trip to learn more about the animal.
2. Population data for the species and/or human population of the region.
3. Information about conservation plans for the species. See the <http://www.wwf.org> site to locate sample conservation plans.
4. Art supplies--construction paper, glue, scissors, markers, etc.
5. Graph paper

### **Instructional sequence**

Most of the activities listed below could be taught as separate activities, or combined in a variety of ways to create an entire unit focused on a particular species.

1. Assign students to a heterogeneous mixed of groups and give each group a list of endangered animals or regions. Allow the groups to choose their focus of research.
2. Before researching, students should develop a list of questions they want to answer in their final product. These questions could include: What do we want to know about the animal's daily life? Why is the animal/region endangered? If measures are not taken to preserve the animal/region, what will happen? Why is it important to study this species/region? At this stage students should also be given the criteria for creating the final product. This will allow them to determine the organization of topics and individual assignments within each group. The criteria for the final product could include many of these expectations depending on each group's focus: Introduction, Purpose Statement, Culture, Education/Literacy Levels, Economy, Population Structure, Health, Maps, Data, Government, Physical Description, History, Climate, Current Research Projects, Analysis of Resources, Adaptations, Habitat, Diet, Reproduction, Social Behavior, Risks to the Species, Proposed Action Plan, etc.
3. Research and gather basic information about the species. There are several strategies that may help in the research process:

Data Collection (<http://www.fieldtripearth.org/strategy.xml?id=35>),  
Data Analysis (<http://www.fieldtripearth.org/strategy.xml?id=38>),  
Graphing Data (<http://www.fieldtripearth.org/strategy.xml?id=28>),  
Informative Writing (<http://www.fieldtripearth.org/strategy.xml?id=40>),  
Persuasive Writing (<http://www.fieldtripearth.org/strategy.xml?id=39>),  
Critical Writing (<http://www.fieldtripearth.org/strategy.xml?id=41>), and  
Writing a Technical Research Paper (<http://www.fieldtripearth.org/strategy.xml?id=33>).

Students may display their information in posters, booklets, brochures, Multi-media presentations (<http://www.fieldtripearth.org/strategy.xml?id=34>), etc.

4. After researching, students will be able to determine some of the major problems that the human population is facing. Discuss any possible correlations between those problems and the decline in the region or species' population. A Socratic seminar (<http://www.fieldtripearth.org/strategy.xml?id=3>) could be held to discuss the impact humans have had on the species/region.
5. Research the importance of the species to its ecosystem. Discuss why we should be concerned with the decline of the species and what impacts its decline is having. For example, determine if the organism is considered a "keystone species" (<http://www.fieldtripearth.org/strategy.xml?id=754>) and what role it plays in its ecosystem, or if the species is an important prey species for another organism and how its decline is affecting other populations. Have students create a flow chart (<http://www.fieldtripearth.org/strategy.xml?id=8>) demonstrating the species' role in the ecosystem or write a paragraph summarizing the class discussion.
6. Create maps that show the past and present ranges of the species. Investigate and create maps showing the past and present land cover and land use in those ranges. Discuss any evident changes and possible reasons for any changes. Discuss connections between the maps. Have students write paragraphs explaining what they have learned by comparing the maps or have them complete Venn diagrams comparing the various maps. The Map Interpretation (<http://www.fieldtripearth.org/strategy.xml?id=9>) strategy offers further suggestions for map use and analysis.
7. Gather population data for the species and for the human population in the region (preferably data that has been collected over an extended period of time). Graph (<http://www.fieldtripearth.org/strategy.xml?id=28>) and analyze the data. Discuss patterns in each graph and any connections between the two. Have students write paragraphs explaining what they have concluded from the graphs.
8. Research and gather information (similar to that listed above) about other threatened or endangered species in the same region (or regions that are nearby). Each student or small group of students can be assigned a species. Again, this information can be displayed visually (<http://www.fieldtripearth.org/strategy.xml?id=14>). Compare the risks and threats of the different species, and discuss possible causes for any similarities and

differences.

9. Research how the people of the region feel about the species and what their relationship with the species is. Study how the organism is reflected in the art and literature of the region. Students can create their own works of art or literature (<http://www.fieldtripearth.org/strategy.xml?id=4>) to symbolize their relationship with the species. Their work could be modeled after the works of the people native to the region. The Prose and Poetry (<http://www.fieldtripearth.org/strategy.xml?id=23>) strategy and the Using Visual Arts (<http://www.fieldtripearth.org/strategy.xml?id=14>) strategy will provide further instructions.
10. Investigate conservation efforts that have been implemented to help the species recover. Discuss the progress, success, and/or failure of these efforts. Contact people involved in the programs for more information, to invite them to be a guest speaker in your class, and to learn how students can help assist in their efforts.
11. Have students develop their own conservation plans for the species. They can use an existing plan as a foundation and develop ways to improve it, or they can create an entirely new plan. They should include all of the information that they have gathered about the species: basic information and pictures, information about the region and the people of the region, why the species is an important part of the ecosystem, an explanation of the source(s) of the problem, an analysis of previous or current conservation efforts, and what they plan to do to improve upon those efforts. This plan may be developed into a research document or multimedia presentation.

### **Extension**

1. Have students study endangered species from other regions across the world. Discuss common threats to the species and common conservation efforts that transcend geographic borders.
2. Share the final projects with students of other grade levels or with parents in the library or a more formalized gathering.

### **Assessment**

1. Rubrics can be used to assess all of the activities listed above.
2. A checkpoint system can be implemented for long-term projects, such as the conservation plan or the species research project.
3. Self-assessment and peer assessment are also appropriate, particularly for large projects, such as the conservation plan. If groups are used, students may be assessed on the individual section of the plan they were responsible for writing.

### **Literacy advancement**

1. Assessing the value and validity of information while researching
2. Collecting information from a variety of sources and creating an original document
3. Analyzing graphs and maps and writing statements that summarize students' analysis

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