NATIONAL GEOGRAPHIC

RESOURCE LIBRARY I ACTIVITY : 1 HR 15 MINS

Bouncing Back from Extinction

Students read an article detailing success stories of other species brought back from the edge of extinction. As a class, students generate a list of possible strategies to protect endangered species from extinction. They think about how they could apply those strategies to their target species and identify which would or would not work well.

GRADES

6, 7, 8

SUBJECTS

Biology, Conservation

CONTENTS

1 Link, 1 Video

OVERVIEW

Students read an article detailing success stories of other species brought back from the edge of extinction. As a class, students generate a list of possible strategies to protect endangered species from extinction. They think about how they could apply those strategies to their target species and identify which would or would not work well.

For the complete activity with media resources, visit:
http://www.nationalgeographic.org/activity/bouncing-back-extinction/

In collaboration with

educurious
learning that connects

DIRECTIONS

This activity is part of the Extinction Stinks! unit.

1. Lead an initial brainstorm discussion of potential strategies for helping threatened species thrive.

- Initiate a think-pair-share discussion to elicit students' ideas about strategies that are used to help protect endangered species. Record students' responses in a visible place.
- Students' ideas will likely follow from their prior knowledge and experience, as well as their research in the *Challenges Faced by Endangered Species* activity. Examples of students' ideas could include:

    - Increasing protected land
    - Stricter laws on hunting or fishing, both the target species and what it eats
    - Limits on logging or resource extraction from the ecosystem
    - Relocating animals to a new location
    - Removing invasive/non-native species
    - Reduce pollution
    - Engineer solutions to prevent predators from harvesting livestock
    - Establish or increase captive breeding programs and reintroduce individuals into protected or restored habitats

- Record students' responses, leaving space next to their list for additions specific to the Sumatran rhino in Step 4.
- Note with students that endangered species often require multiple strategies for conservation of the species. Students are working to identify one possible solution to help protect their species, but ultimately many tactics are helpful to protect the species' survival.

2. Highlight the need to consider human needs when working to save species, through a class discussion and video.

- Brainstorm reasons why humans may threaten a species' survival. Some responses may include:

    - Hunting/fishing for food
    - Poaching
    - Habitat loss due to development or climate change

- Show the *Environmental Turnaround* video (3:57). After the video, lead a discussion emphasizing how humans threatened and later helped species' survival in and around the Gorongosa National Park in Mozambique.

- Connect this to the unit project by explaining the need to include local communities when designing conservation solutions.

3. Read and analyze an article about conservation success stories.

- Distribute copies of the article *12 animals That Bounced Back From The Brink* and have students read individually or in pairs.
- Tell students to make a list of all strategies they find that helped the listed endangered species increase their numbers.
- Return to the list created in Step 1 and add any new strategies from the article.
- Have students think about the design criteria that conservationists need to consider when choosing a path to helping an endangered species.
    - Be sure that they consider and include:
        - Meeting the needs of the target species
        - Affordability/feasibility with the available budget and labor
        - The impacts on other species in the ecosystem
        - Preservation of ecosystem services and human needs
    - Considering these constraints will be important for student groups as they design their conservation plan for their target species.

4. Apply conservation lessons to the class focal species, the Sumatran rhino, and extend to students' target species.

- Refer back to the list of possible conservation strategies made in Step 1.
    - Ask students to consider possible conservation solutions for the Sumatran rhino.
        - Ensure students consider a local perspective on different conservation strategies.
        - Prompt students to explicitly connect strategies listed in Step 1 to the Sumatran rhino, recording connections next to their original list.
- Prompt students to meet in their target species groups to discuss which strategies would have the best potential to protect their species.
    - Remind students to consider the criteria and constraints they identified in Step 3 for their local community/ecosystem.

    - Incorporate the perspective of local community members based on students' prior research. Ask: *Would someone living in the area of your target species think differently about conservation strategies than an outsider? Why or why not?*

  - Students can refer to the list on the board to apply conservation strategies to their group's target species.

- Working individually, have students identify what they consider to be the most and least appropriate potential conservation strategies for their focal species. Direct students to support their claims with evidence from their *Species Research* handout from the *Challenges Faced by Endangered Species* activity and reasoning that takes into account species and human needs.

Informal Assessment

Evaluate students' responses about what solutions would work well for their species and which would not work well to ensure their arguments are logical, clear, and complete. Look for evidence that stems from the research that they completed in the *Challenges Faced by Endangered Species* activity.

Extending the Learning

Read more about the Endangered Species Act and how it saved many species from imminent extinction. The U.S. government suggested several changes to the Endangered Species Act in 2019, including making it easier for companies to use ecosystems that are important to protected species for development or resource extraction, and taking economic factors into account when deciding which species to protect. Ask students: *Would you choose to make those changes? What are the pros and cons of making such a change?*

OBJECTIVES

Subjects & Disciplines

Biology

- Conservation

Learning Objectives

Students will:

- Brainstorm and identify strategies used by humans to increase the number of specific threatened species in the past.
- Identify criteria and constraints involved in designing conservation strategies to help endangered species.
- Evaluate possible strategies to help protect a target species.

Teaching Approach

- Project-based learning

Teaching Methods

- Brainstorming
- Discussions
- Reading

Skills Summary

This activity targets the following skills:

- 21st Century Themes
  - Environmental Literacy
  - Global Awareness
- Critical Thinking Skills
  - Applying
  - Remembering
  - Understanding
- Science and Engineering Practices
  - Constructing explanations (for science) and designing solutions (for engineering)
  - Engaging in argument from evidence
  - Obtaining, evaluating, and communicating information

National Standards, Principles, and Practices

COMMON CORE STATE STANDARDS FOR ENGLISH LANGUAGE ARTS & LITERACY

• **CCSS.ELA-LITERACY.RH.6-8.7:**
Integrate visual information (e.g., in charts, graphs, photographs, videos, or maps) with other information in print and digital texts.
• **CCSS.ELA-LITERACY.RST.6-8.10:**
By the end of grade 8, read and comprehend science/technical texts in the grades 6-8 text complexity band independently and proficiently.

NEXT GENERATION SCIENCE STANDARDS

• **Crosscutting Concept 2:**
Cause and Effect
• **ETS1.B: Developing Possible Solutions:**
There are systematic processes for evaluating solutions with respect to how well they meet the criteria and constraints of a problem.
• **LS2.C: Ecosystem Dynamics, Functioning, and Resilience:**
Biodiversity describes the variety of species found in Earth’s terrestrial and oceanic ecosystems. The completeness or integrity of an ecosystem’s biodiversity is often used as a measure of its health.
• **LS4.D: Biodiversity and Humans:**
Changes in biodiversity can influence humans’ resources, such as food, energy, and medicines, as well as ecosystem services that humans rely on— for example, water purification and recycling.
• **MS. Interdependent Relationships in Ecosystems:**
MS-LS2-5. Evaluate competing design solutions for maintaining biodiversity and ecosystem services.
• **Science and Engineering Practice 6:**
Constructing explanations and designing solutions
• **Science and Engineering Practice 7:**
Engaging in argument from evidence
• **Science and Engineering Practice 8:**
Obtaining, evaluating, and communicating information

Preparation

What You'll Need

MATERIALS YOU PROVIDE

- Copies of handout[s]
- Whiteboard, chalkboard, or chart paper

PHYSICAL SPACE

- Classroom

GROUPING

- Large-group instruction
- Small-group work

ACCESSIBILITY NOTES

Students may use reading scaffolding strategies to break down the article provided.

BACKGROUND & VOCABULARY

Background Information

We can learn from past success stories to develop conservation solutions for today's endangered species, and to plan for the future. The Endangered Species Act of 1973 helped designate funds for species conservation and habitat protection by U.S. federal law. Even earlier, the Migratory Bird Treaty Act of 1918 made it illegal to possess or sell parts of migratory birds to protect the animals that move across borders. Both legislative acts are believed to have stopped the extinction of many species. There are many other creative ways that humans have protected endangered species. For example, people have engineered innovative ways of deterring endangered predators from eating livestock, reducing human-wildlife contact. Local communities may also engage in conservation efforts if they realize that there is value to them, like the Warrior Watch project in Kenya that transitioned Maasai people from hunting lions to protecting them.

Prior Knowledge

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Recommended Prior Activities

- Challenges Faced by Endangered Species
- Ecosystems Help Everyone—Even Humans!

Vocabulary

Term	Part of Speech	Definition
conservation	*noun*	management of a natural resource to prevent exploitation, destruction, or neglect.
criteria	*plural noun*	set of standards or rules.
endangered species	*noun*	organism threatened with extinction.
extinction	*noun*	process of complete disappearance of a species from Earth.
extinction	*noun*	process of complete disappearance of a species from Earth.
habitat	*noun*	environment where an organism lives throughout the year or for shorter periods of time.

For Further Exploration

Articles & Profiles

- Washington Post: Want to help save animals threatened by extinction? Become a citizen scientist.
- National Geographic: See 8 animal species that came back from the dead
- National Geographic: Inside the effort to weaken the Endangered Species Act