

## Habitat Restoration

Keywords: Controlled burn, habitat restoration, endangered species

Lesson Plan Grade Level: 5<sup>th</sup>-8<sup>th</sup> grade

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Total Time Required for Lesson: 50 minutes or 3 17-minute sessions

Setting: Classroom

Subject Covered: Science, Reading, Writing, and Speaking and Listening

Topics: ecosystems, invertebrates, botany, endangered species

Lesson Goals:

Students will be able to list and explain regal fritillary butterfly life cycle.

Students will be able to identify ecosystem restoration stages.

Students will be able to identify three components of the fire behavior triangle.

Students will be able to identify controlled burn benefits.

Materials Needed:

Habitat restoration PowerPoint

Habitat restoration PowerPoint - teacher guide

[http://www.youtube.com/watch?v=X41C71aSZ6Q&feature=player\\_embedded](http://www.youtube.com/watch?v=X41C71aSZ6Q&feature=player_embedded)

Regal fritillary handout (one per student)

Regal fritillary fact sheet (one per student)

Pencils (one per student)

State Standards Addressed:

3.3.7A. Describe the similarities and differences that characterize diverse living things.

4.3.7.B. Explain the distribution and management of natural resources.

4.5.6.D. Identify reasons why organisms become threatened, endangered, or extinct.

4.1.7.E. Identify factors that contribute to change in natural and human-made systems.

4.4.5.C. Investigate the factors influencing plant and animal growth.

Common Core State Standards in English Language Arts:

Reading Standards for Informational Text 5-8: key ideas and details; craft and structure; and integration of knowledge and ideas

Writing Standards 5-8: text types and purposes; research to build and present knowledge

Speaking and Listening Standards 5-8: comprehension and collaboration; presentation of knowledge and ideas

Teaching Model: KWL

Methods:

### Preparation:

Obtain permission from information technology coordinator for YouTube access. Read through the entire lesson, vocabulary list, and habitat restoration PowerPoint teacher guide to ensure you understand the materials. Be sure to have all the materials before beginning the class. Create three columns on the blackboard with the headings: “What you know,” “What you want to know,” and “What you learned.”

### Doing the Activity:

#### Introduction to the lesson plan:

“Today we will be learning how one location in Pennsylvania, Fort Indiantown Gap, is using habitat restoration to maintain habitat for endanger species including the regal fritillary butterfly. Fort Indiantown Gap is a military training site in central Pennsylvania near Harrisburg. Our ultimate goal is to understand the role of controlled burn in creating habitat.”

#### Steps:

1. “Let’s start by reviewing what you know.” Ask students the following questions and have them write the answers in the first column (What you know) on the blackboard. What is an endangered species (e.g., small population that could go extinct)? What is habitat (e.g., food, water, living space needed by plants, insects and animals)? Habitat restoration or ecology is the practice of renewing and restoring degraded, damaged, or destroyed ecosystems through human intervention and action. Habitat restoration is also done to create or maintain habitat for endangered species like the regal fritillary. Ask students what they want to learn and write responses in the middle column. If not already mentioned add regal fritillary characteristics, natural history, preferred habitat, reasons for concern, and management programs.
2. Have students break into small groups (4-5 students) and give each group copies of the regal fritillary fact sheet and five regal fritillary handouts (characteristics, natural history, preferred habitat, reasons for concern, and management programs) to read and answer specific questions. Assign a topic to each small group. “I want you to read the fact sheet and answer your small group’s questions on your handout. You will report your findings to the class.” The fact sheet has all the information needed to answer questions.
3. Come back and have the groups report out in the following order: characteristics, natural history, preferred habitat, reasons for concern, and management programs. As student groups report out, other students need to write two facts for the designated topics in the box at the bottom of their handout. For example, students in the biology/natural history group need to write two facts about characteristics and two facts about reasons for concern.
4. Now that we know a little about the regal fritillary, I am going to show a short video on Fort Indiantown Gap’s efforts to create and maintain regal fritillary habitat. Pay close attention to the butterflies’ habitat. Show video. Briefly discuss where the violets grow (bare soil).
5. Fort Indiantown Gap also uses controlled burns to create habitat for endanger plants and animals as well as restore ecosystems. To learn more about how this is done, we are going to look at a PowerPoint created by Fort Indiantown Gap. Go through the PowerPoint using the prepared talking points/notes.

6. Return to the blackboard to review what we know, what we want to learn, and what we learned. “Earlier we listed what you know about endangered species and habitat. We also listed what you wanted to learn about regal fritillary butterfly. Now let’s cover what you learned. Who conducts controlled burns?” Key points for students: trained professionals ignite, control and extinguish wildfires. Before doing a burn, they collect data on the terrain, slope, plants, and trees. They use computer modeling software to develop a controlled burn plan based on site vegetation, expected weather conditions, and desired outcomes. They only do a controlled burn when it is safe. They have equipment and water ready to control and extinguish the fire. However, when trained professionals do not follow the controlled burn plan (i.e., faster wind speed, drier conditions), fires could burn outside their designated area. In some cases, homes were lost. But, this is rare. In addition, a control burn may not have the desired outcome such as killing unwanted plants and trees. In this situation, natural resource professional consider next steps to achieve their management goals.
7. Discuss benefits of controlled burns. Repeated low intensity fires kill unwanted plants and trees. It allows fire dependent species such as oak to grow. The fire returns phosphorus and minerals to the soil. Table mountain pine and pitch pine need the heat of the fire to open their cones and release their seeds.

**Assessment:**

Use what you know, want to know, and learned exercise to measure student understanding of the subject matter. Students turn in their handouts. Review to ensure they completed the fact section at the bottom of the box. In addition, grade student group presentations.

**Lesson Conclusion:**

Fire can benefit the environment when done by trained professionals. The military at Ft. Indiantown Gap is using controlled burns to create meadows for military exercises as well as habitat restoration.

**Additional Resources:**

Great Plains Nature Center – regal fritillary webpage: <http://www.gpnc.org/regal.htm>

US Geological Survey, Northern Prairie Wildlife Research Center:

<http://www.npwrc.usgs.gov/resource/wildlife/nddanger/species/speyidal.htm>

Pennsylvania Department of Military and Veterans Affairs, Ft. Indiantown Gap regal fritillary project:

[http://www.portal.state.pa.us/portal/server.pt/community/featured\\_topics/13476/regal\\_fritillary\\_butterflies\\_at\\_fort\\_indiantown\\_gap/726675](http://www.portal.state.pa.us/portal/server.pt/community/featured_topics/13476/regal_fritillary_butterflies_at_fort_indiantown_gap/726675)

Controlled Burn Vocabulary list (for teachers)

**Nutrients:**

A substance that provides nourishment for growth or metabolism. Plants absorb nutrients mainly from the soil in the form of minerals and other inorganic compounds, and animals obtain nutrients from ingested foods. When fire burns organic matter or fuels, it releases carbon dioxide and nitrogen gas into the air and deposits ash on the soil. Ash is more soluble

than the organic matter from which it originated. Thus fire increases available minerals, phosphorous, exchangeable bases, and soil pH that plants need.

**Controlled burn/prescribed fire:**

Controlled burns are fires ignited, controlled, and extinguished by trained professionals for the purpose of vegetation management including restoring habitat for native plants and animals.