



## Lesson 8: Disturbances in Ecosystems

Determine how various disturbances disrupt the relationships within your system.

**Grade Level:** Middle School 6-8

### Essential Question:

How does your local system react to disturbances?

### Objectives:

At the end of this lesson, students will:

- *Understand* that disturbance is both a natural or non-natural element of an ecosystem.

### Assessment opportunities:

At the end of this lesson, you will be able to assess students through:

- The additions that the students have made to their species account.

### Performance Expectations: Next Generation Science Standards:

#### MS-LS2-4.

Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.

#### MS-LS2-5.

Evaluate competing design solutions for maintaining biodiversity and ecosystem services.

### Key Understandings

Organisms, and populations of organisms, are dependent on their environmental interactions both with other living things and with nonliving factors.

### Common Student Misconceptions or Challenges

Students may understand the concept of disturbance such as insect outbreaks, fire, weather events or human-caused actions, but they may not understand that these can be good for the system and can be a part of the growth of an ecosystem. On the other hand, disturbances can go beyond their natural scope. The current bark beetle epidemic is an example of a natural disturbance that is more severe than known from the past. Students may have a hard time grasping this line.

### Background Information

The students will be in the process of researching and developing a field guide entry for the organism they choose. They will need to understand:

- That disturbances can come in many forms and just because they are “natural” doesn’t mean they are good for the environment and vice versa. However, ecosystems are adapted to disturbances that occur repeatedly.
- Different species in an ecosystem may respond to the same disturbance in very different ways.
- [Disturbance may affect the flow of energy through the system, or the cycling of carbon or nutrients, and these changes, in turn, will affect the species.](#)
- Some anthropogenic disturbances may cause the collapse of an ecosystem.



# Lesson 8: Ecosystem Disturbances

## Materials:

- Disturbance flow sheet
- Pens
- Computers
- Internet
- Research books

## Time Commitment:

1-2 45-minute class periods

## Preparation:

- Research local disturbances to your ecosystem. To be able to guide students.
- Have resources available for students to use for research (computers, books etc.)

## Directions:

1. Brainstorm possible disturbances that could affect or have affected the study area. Include natural disturbances (such as weather fluctuations like drought or flood, fire or insects) and human-caused disturbances (e.g., agriculture, energy development, urban encroachment). Climate change is a disturbance, even though it happens relatively slowly.
2. Divide the class into cooperative groups and have each choose a different disturbance to investigate.
3. Have them research the possible effects of the disturbance. Use the “prediction flow chart” to predict long-term effects of the disturbance on the ecosystem.

(see below). Be as specific as possible in describing what the changes are, and how the changes affect the system.

4. Is it possible to mitigate the adverse effects of the disturbance? In the case of future human-caused disturbances, can you recommend any mitigative actions?
5. In a similar way, consider the effects of the disturbance on each student’s species. Have students add this information to their species account sheets.

