

## Forest Consequences



### Next Generation Science Standards Disciplinary Core Idea: ESS2.E

**Biogeology** Living things affect the physical characteristics of their region.

### Science and Engineering

**Practice:** Obtaining, evaluating, and communicating information

### Crosscutting Concept:

Stability and change

### Common Core State Standards:

**CCSS.ELA-LITERACY.RI.4.1:** Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text.

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### ACTIVITY DESCRIPTION

In this activity, students will read proposals of different ways that a natural wooded area could be used and determine the best use of the land by weighing the costs and benefits of each proposal on the environment, economy, and community.

### GUIDING QUESTIONS

- How do trees and wooded areas impact the surrounding ecosystem and region?
- What are the benefits of trees to the environment, community and economy?

### OBJECTIVE

Students will demonstrate their understanding of the importance of trees and wooded areas on the environment, the economy, and the community by determining the best use of forest land.

### VOCABULARY

**Economy** - the wealth or resources of a country or region

**Environmental Management** - the process of protecting and maintaining ecosystems for future generations by considering ethical, economic, and ecological concerns

**Erosion** - the process by which the surface of the earth is worn away by the action of water, glaciers, winds, or waves.

**Pollution** - the presence or introduction into the environment of a substance that has harmful or poisonous effects.

### MATERIALS

PER GROUP:

- One copy of the Morris Woods Information handout
- One copy of the Morris Woods Proposals handout

### PREPARATION

Make enough copies of the Morris Woods Information handout and Morris Woods Proposals for each group.



## Forest Consequences Procedures

### Engage | 5 minutes

1. Tell students to reflect on what trees need, from the Field Study Activity, and ways that trees impact the environment from the Pre Field Study Activity.
2. In their science notebooks, have students list what trees need in order to survive (water, nutrients, space, sunlight) and the benefits that trees have on the environment (e.g. the reduction of erosion and pollution).
3. Encourage students to share their lists with a partner and then discuss with the whole class.

### Explore | 30 minutes

1. Ask students to imagine that they have been given a large piece of forest land called Morris Woods on the outskirts of town. They can do anything they want with it, but they must consider all possible uses of the land and all the ways it could benefit people, industry, or the environment before the Town Council makes their decision.
2. Break the students up into four groups. One group will represent the Town Council and will be responsible for deciding on which proposal(s) will be approved. The other three groups will each represent one of the three proposals.
3. Explain to the students that will be representing either Proposal 1, 2 or 3 that they are going to become the experts of their proposal and try to get their proposal approved by the Town Council. Each team will read their proposal and then as a group create a list of the pros and cons of their proposal. Please tell the students that they should be prepared to answer the questions at the bottom of the proposal in the event the Town Council wants further information about the proposal. Explain to the Town Council group that their job is to read all three proposals and ask each group questions about their proposal. The Town Council group will decide on the proposal and/or combination of proposals that will be approved for Morris Woods.
4. Pass out a copy of the Morris Woods Information handout to each group. Read this page aloud to the class, as they read along.
5. Pass out the assigned copies of the Morris Woods Proposals to each group. Make sure that the Town Council group gets a copy of all three proposals so they are familiar with what will be presented in addition to the Morris Woods Town Council handout.
6. Instruct the three groups that are representing Proposal 1, 2 and 3 to read their assigned proposals as a group and create a list of pros and cons. Ask the Town Council group to read all three proposals as a group and pick out questions to ask each proposal group.

### Explain | 20 minutes

1. After the students are done reading the proposals have them pick one person per group to give a summary of the proposal and the pros and cons to the Town Council group. Give the Town Council an opportunity to ask questions to the group representatives.
2. Once all groups have presented in front of the Town Council give the Town Council group a few minutes to decide which proposal they will accept. Make sure the Town Council knows that they can combine proposals and choose more than one. Tell the Town Council that they must explain how they made their decision.
3. Have the Town Council group share their decision and explain the reasoning behind their decision.

### Elaborate | 10 minutes

1. Lead the students in a class discussion about the potential consequences of the different proposals on the health of the local ecosystem, the economy, and the community.

### Evaluate | 5 minutes

Ask students to complete the summative questions in their science notebooks or as an exit slip.

Summative Questions:

1. List at least four ways that trees impact the environment, economy, or community.
2. If the wooded area was removed for development, describe the ways that this might impact the land, water, and air in the area.
3. If the wooded area was removed for development, describe the ways that this might impact the organisms that live in the woods.

### Differentiation

**Extension:** Students can put together a special class newspaper, radio, or TV broadcast that features the Morris Woods controversy. Students can write a news story or opinion piece for the project. For radio or TV broadcasts, encourage students to work in groups and try some live interviews or playacting.

Notes on Modifications for Your Diverse Learners: \_\_\_\_\_

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## Forest Consequences Morris Woods Information

### BACKGROUND

Recently, a citizen donated 250 acres of nearby land to the town of Morrisville. The land, known as Morris Woods, is completely covered with forest, including about 100 acres of old-growth forest that is over 150 years old and has very large trees. A stream flows through the forest, and it has good places for swimming. Deer, raccoons, frogs, salamanders, foxes, many different birds, and other animals live in the forest.

Morrisville is a medium-sized town. Many people who live there work for a local lumber company, but a lot of people also work at a computer-parts plant in a neighboring town. Many people work in Morrisville itself at the schools, library, and small businesses.

The town council has to decide what to do with the land. Some people want to preserve the entire area with all of its animals and plants so that it can provide people with a wilderness experience close to home. A developer has offered to buy the land and build a shopping mall and luxury homes. A local forest management company has offered to buy the land and sustainably manage it to provide forest products, wildlife habitat, and scenic hiking trails.



## Forest Consequences Morris Woods Proposal #1

**Proposal:** Morrisville should sell the woods to the Morris Woods Development Company to develop a shopping mall and new homes.

**Perspectives:** Shopping malls are very convenient places for people to shop – all the stores are together under one roof and people can go from one store to another without going outside which is a big plus, especially in bad weather. Malls draw people from a wide area and their shopping can mean big money, which would be used to improve Morrisville schools and the town library, and would provide social services such as medical care and affordable housing.

Using the entire woods as wilderness for a small number of nature enthusiasts is not in the best public interest. Our development plan will make the land more accessible for more people.

PROS	CONS

**Please be prepared to answer the following questions that may be asked by the Town Council:**

1. What **facts** presented in the proposal support land use?
2. What **opinions** are presented in the proposal?
3. What are the advantages of adopting the proposal?
4. What are the possible costs to the town?
5. What are the other negative effects of the proposal?
6. Who benefits most from the proposal?
7. Who or what would be most harmed by it?
8. If you adopted the proposal, what changes, if any, would you want to make to it?

## Forest Consequences Morris Woods Proposal #2

**Proposal:** Morrisville should sell Morris Woods to the Simpson Tree Farm, which would manage the forest for multiple uses.

**Perspectives:** Simpson Tree Farm offers to buy Morris Woods to manage it in a way that will sustain both commercial and environmental benefits. A section of forest will be set aside to protect the stream and important habitat areas.

In other parts of the woods, selective cutting will be used. This means that trees will only be cut under carefully controlled circumstances and new trees will be planted where old trees have been cut. Hiking and other recreation will be allowed in the woods.

The money from the sale of Morris Woods will provide jobs and improve the economy in Morrisville, which would help education and social programs. It could also provide new jobs for foresters, scientists, loggers, truckers, and mill workers.

Like other natural resources, forests should provide economic, social, and ecological benefits at the same time. We can provide these benefits in a sustainable way. If the land is developed for a mall and luxury homes, valuable resources and wildlife habitat will be lost. According to our management plan, there will be minimal environmental trade-offs.

PROS	CONS

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3. What are the advantages of adopting the proposal?
4. What are the possible costs to the town?
5. What are the other negative effects of the proposal?
6. Who benefits most from the proposal?
7. Who or what would be most harmed by it?
8. If you adopted the proposal, what changes, if any, would you want to make to it?

## Forest Consequences Morris Woods Proposal #3

**Proposal:** Morrisville should keep ownership of Morris Woods and manage it as a protected natural area. The city should build and maintain hiking trails through it so the people of Morrisville can enjoy it.

**Perspectives:** Morris Woods is a unique area. Giant trees make up about 100 acres of the forest. Some of these trees are over 150 years old and were growing long before Morrisville even existed. Many other plants and different kinds of animals also live in these woods.

If the trees are cleared for development, the habitat of those creatures will be destroyed. Several kinds of fish breed in the streams that flow through the woods. The fish depend on cool water and gravel bottoms to lay their eggs. If parts of the forest are cleared, the fish may not be able to breed because tree roots will no longer be present to slow erosion. Soil and other debris from the cleared land may wash into the streams and cover the gravel. Also, with fewer trees to shade the stream and condition the air, temperatures on the ground and in the stream will increase. Without the woods nearby, noise, air, and soil pollution may become a problem.

PROS	CONS
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**Please be prepared to answer the following questions that may be asked by the Town Council:**

1. What **facts** presented in the proposal support land use?
2. What **opinions** are presented in the proposal?
3. What are the advantages of adopting the proposal?
4. What are the possible costs to the town?
5. What are the other negative effects of the proposal?
6. Who benefits most from the proposal?
7. Who or what would be most harmed by it?
8. If you adopted the proposal, what changes, if any, would you want to make to it?

## Forest Consequences Town Council Handout

Please be prepared to ask the following questions to proposal representatives:

1. What **facts** presented in the proposal support land use?

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2. What **opinions** are presented in the proposal?

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3. What are the advantages of adopting the proposal?

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4. What are the possible costs to the town?

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5. What are the other negative effects of the proposal?

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6. Who benefits most from the proposal?

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7. Who or what would be most harmed by it?

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8. If you adopted the proposal, what changes, if any, would you want to make to it?

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