



Explore, Lesson #4: Ecosystem Services Assessment

These materials are all part of EPA Report #: EPA/600/R-18/231.

Time Consideration

Prep time: 0-5 minutes, **Activity time:** 15-20 minutes

Materials

Printed handouts, clipboards, writing utensils, an area outside to observe the environment

Teacher Preparation

1. Print all of the **Ecosystem Services Assessment** Handouts and get writing utensils for all of the students.
2. Place the **Ecosystem Services Assessment** on clipboards. Having the students work in pairs is recommended.

Procedure

1. Deliver background information on **ecosystem services: providing the benefits that humans receive from nature**. Have students provide examples of ecosystem services and related human benefits.

*Examples of ecosystem services: trees provide oxygen which we breathe; trees provide shade on the playground (US EPA 2008); wetlands filter water (Vellidis et al., 2003); forests provide places for people to recreate (Kline et al., 2011).
Examples of human benefits: reductions in stress and anxiety from spending time at the beach (MacKerron & Mourato 2013); reduced symptoms of post-traumatic stress disorder after spending a weekend fly-fishing by the river (Vella et al., 2013).*

2. Explain that you're going outdoors to assess and investigate ecosystem services on your own school grounds. Tell students to pay attention to examples of ecosystem services that are provided by the ecosystem where you complete this activity, and what their benefits to humans might be. For example, trees providing shade is an



ecosystem service, and increased comfort and safety from shade are the related human benefits provided by that service.

Note: This activity can be repeated multiple times throughout the school year at varying sites during different seasons (fields, meadows, beside creeks, and woods work well, but you could also use a playground, park, urban area, or residential area).

3. Have the students work on Part 1 (Ecosystem Location) and Part 2 (Ecosystem Evaluation) and then come back inside.

Optional: Have students use their phones to take photos of ecosystem services that they see outside. Once inside, have them present their ecosystem and ecosystem services using the photos that they took.

4. Once back inside, have the students work in groups on Part 3 (Ecosystem Services). Help the students generate ideas.
5. **Evaluate:** During the group discussions, informally assess student understanding of ecosystem services. Then, have the groups share and **explain** their examples with the whole class. Finally, formally assess student understanding with the collection and reading of the student handouts.



Figure 1. Ms. Drea Franks, teacher at First Environments Early Learning Center, helps 2nd and 3rd grade students explore and evaluate their local school grounds for ecosystem services (in this image, students discuss water runoff and how plants (the bushes planted at the bottom of the hill) can help retain water to prevent erosion).

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EnviroAtlas

people health nature economy

Lesson Plan

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Ecosystem Services Assessment

“Any progress achieved in addressing the goals of poverty and hunger eradication, improved health, and environmental protection is unlikely to be sustained if most of the ecosystem services on which humanity relies continue to be degraded.”

-- UN Millennium Ecosystem Assessment

Name(s): _____ Date: _____

Location: _____

Part I. Ecosystem Survey

Check all applicable ecosystem descriptions:

- | | | |
|--|---|---------------------------------------|
| <input type="checkbox"/> Wetlands | <input type="checkbox"/> Field/Meadow | <input type="checkbox"/> Business |
| <input type="checkbox"/> Agro-Ecosystem | <input type="checkbox"/> Lake/Pond | Area/Parking lot |
| <input type="checkbox"/> Urban Ecosystem | <input type="checkbox"/> Stream/Creek/River | <input type="checkbox"/> Neighborhood |
| <input type="checkbox"/> Forest | <input type="checkbox"/> Shrub area | <input type="checkbox"/> Other: _____ |
| <input type="checkbox"/> Desert | <input type="checkbox"/> School/Playground | |
| <input type="checkbox"/> Ocean | <input type="checkbox"/> Park | |

Briefly describe the ecosystem: _____

Major vegetation (trees, shrubs, etc.): _____

What wildlife might you expect to see here? _____

Any animals (including birds) seen on site: _____

Part II. Ecosystem Evaluation

Below, write some general observations about the ecosystem where you are:

Does this ecosystem seem degraded? Yes No If yes, describe how the ecosystem seems degraded: _____

Does this ecosystem provide habitat for animals? Yes No If yes, describe the evidence that this ecosystem provides habitat for animals: _____

Does this ecosystem provide food for animals? Yes No If yes, describe the evidence that this ecosystem provides food for animals: _____

Part III. Ecosystem Services

Ecosystem goods and services (often shortened to ecosystem services) provide the benefits that humans receive from nature. *EnviroAtlas* uses seven broad categories to organize its information and data on ecosystem services:

- Clean Air
- Clean and Plentiful Water
- Natural Hazard Mitigation
- Climate Stabilization
- Recreation, Culture, and Aesthetics
- Food, Fuel, and Materials
- Biodiversity Conservation

Observing the ecosystem **that you are in right now**, fill in the chart below with specific examples of how the ecosystem may provide ecosystem services.

Ecosystem Services	Examples of how this ecosystem provides this ecosystem service to humans
Clean Air	<i>Example: trees filter carbon dioxide out of the atmosphere and produce oxygen.</i>
Clean and Plentiful Water	
Natural Hazard Mitigation <small>(Natural Hazards include, but are not limited to: floods, wildfires, landslides, and extreme heat)</small>	
Climate Stabilization	<i>trees are one type of natural feature that can store carbon</i>
Recreation, Culture, & Aesthetics	<i>Example: we are in a garden; there are people walking and observing the plants</i>
Food, Fuel and Materials	
Biodiversity Conservation	<i>Example: native plant species in a garden</i>