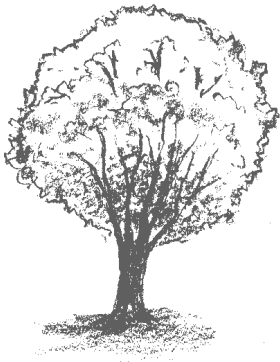


Ecosystem services inventory in your school yard

Teacher notes!



Goals:

- *Introduce the concept of “ecosystem services.”*
- *Get students thinking about both how we rely on ecosystem services and how our own actions affect an ecosystem’s ability to provide those services we (or others “downstream”) rely on.*
- *Think about ecological processes at a larger spatial scale (whole forest, whole landscape, global).*
- *Make observations in nature.*

Materials to bring:

- Millenium Ecosystem Assessment handout
- Inventory field notes handout
- clipboards
- *optional:* soil corer, tree corer, DO/pH/conductivity meter for streamwater—to give examples of ecological measurements related to ecosystem services

1. What are ecosystem services?

- a. Brainstorm
- b. definition (see MEA handout). “Greater than the sum of its parts”
- c. types (see MEA handout)
- d. Why do we use this framework? --Humans depend on ecosystems but are simultaneously diminishing ecosystems’ abilities to meet our demands, using them unsustainably. Need a framework that provides information about when and how to intervene through policy and management. How much ecological degradation, depletion, extinction is too much? Put in human terms.
- e. How do we measure them? Different types of science: natural science, economics, social sciences.
 - i. KBS ecologist Doug Landis and KBS economist Scott Swinton worked together to figure out how much money soybean farmers saved by reducing pesticide use to control soybean aphids by using integrated pest management—including managing their land to support soybean aphid predators (lady bugs), i.e. forests for over-wintering and old fields for providing food for the lady bugs when the aphids weren’t present. They found that farmers using integrated pest management saved \$33 dollars per hectare (2.4 acres).
- f. How quantifying them affects land use and conservation policy: allows policy makers to weigh the cost of ES degradation against the benefit of conserving ES in human terms (often dollars).
- g. *Disadvantages* of thinking in terms of ES –putting ecology in anthropocentric units of analysis. De-values ES. Promotes human-centered approach to environmental

management.

- h. Ecosystem dis-services
 - i. loss of regulating services
 - 1. extreme weather (hurricanes, floods, droughts)
 - 2. urban heat island effect
 - 3. disease vectors (mosquitoes)
 - ii. nutrient cycling problems
 - 1. greenhouse gas emissions leads to climate change
 - 2. primary production gone awry → harmful algal blooms
- 2. Make predictions
 - a. Types of ES at each habitat (see handout)
- 3. Hike!
 - a. Encourage students to make observations along the way, take notes, ask questions.
 - b. Stop at the stream, hardwood forest, old field, and parking lot to discuss ES's you see or infer must be happening.
 - c. Finish at the parking lot
 - i. Impervious cover and ES (dis-service)
 - ii. Urban heat island effect (dis-service)
 - iii. Predictions vs. observations
 - iv. What did you learn?
 - v. Critical thinking questions on back of handouts for you all to discuss later / on bus ride back / etc.