Educational Partners:

Into the Outdoors

FORESTS OF THE FIRST STEWARDS

Higher Education Discussion Guide

Forests of the First Stewards | Episode 4 | Curriculum Outline

LEARNING OBJECTIVES:

1. Evaluate the ecological principles underlying forest management, including silviculture and ecosystem monitoring.
2. Analyze the role of academic research and partnerships in advancing sustainable forestry practices.
3. Assess the long-term importance of stewardship, conservation, and ecological monitoring in maintaining forest health.

LEARNING PROCEDURE:

1. Show students the fourth episode “Education Continued and Overview/Epilogue”
2. Deliver a lecture that provides more background information.
3. Outline instructions for individual ang group activities and due dates.
4. Reflection and Discussion
5. Assessment (Quiz): Can take place during the next class period or submit online.

EPISODE 4 OVERVIEW EDUCATION CONTINUED AND OVERVIEW/EPILOGUE

How do students today become forest professionals tomorrow?

In this episode, we continue exploring education and take a closer look at how universities are preparing for the next generation of forestry professionals.

We visit the University of Wisconsin–Stevens Point to learn how students are studying forestry, conducting research, and testing new ideas that connect forest resources to modern products. In the laboratory, we explore how materials are tested for composability and how science is used to understand how products break down and return to the environment.

Through this work, students learn how to apply both scientific thinking and real-world problem solving to support sustainable forestry and product development.

This episode highlights how education, innovation, and careers all play a role in shaping the future of forests and the people who care for them.

SUMMARY OF ACTIVITIES:

Reflection and Discussion: 15 to 20 minutes:

- Place students in group of 2 to 4
- Give them 15 minutes to discuss the following topics and have groups present a summary of their discussion/ share their perspectives with the class.
- Potential Topics:
    - Discuss the differences between traditional silviculture and ecological silviculture.
    - The impact of partnerships between research, academic, and industry has an impact on sustainable forest management.
      The value of practices such as ecological monitoring and ecological silviculture in forest management.

Science Communication (Group) Activity: Divide students into groups of 2 to 4. Each group will be expected to create at least 1 social media post about forest products. The post should:

1. Identify at least one everyday forest product.
2. How is the product used in everyday life?
3. How is that product manufactured?
4. Careers associated with forest products.

Social Campaign (Individual) Activity: Students will be expected to identify ecological monitoring programs within their state and will create a media campaign about the organization. The campaign should include:

1. Social media post that highlights the program
2. Blog post (3 to 5 paragraphs) about the program
3. Shortform video about the program

Students are allowed to utilize credible sources for this project such as publications, press releases, interviews, etc.

Assessment: Quiz

This quiz will serve as an assessment to measure students' retention of information. This quiz can be administered in class or as an online assignment. Quiz should consist of 5 to 10 questions.

Potential Quiz Questions:

1. Define ecological monitoring.
2. What is ecological silviculture.
3. Identify the four operational principles of ecological sylviculture. (Select all that applies).
4. What is heterogeneity?
5. Which operational principle of ecological silviculture considers what is left behind during silvicultural interventions? (Multiple choice)
6. What is the WIST?
7. Which operational principle of ecological silviculture considers timeframes that are appropriate to sustain and restore specific functions?
8. Discuss the importance of partnerships like that between the WEDC and WIST.
9. Why is ecological monitoring valuable to long-term forest management?
10. True or False: Ecological silviculture prioritizes wood production.

ADVANCED VOCABULARY:

1. Ecological silviculture – an approach to forest management that includes trees, associated organisms, and ecological functions based on emulating natural models of development. (USDA Forest Service)
2. Heterogeneity – variability in a system that accounts for scale, the quality of something being composed of different parts, elements, kinds, or individuals. (Plant and Soil Sciences eLibrary)

BACKGROUND INFORMATION:

Ecological Principles and Forest Management

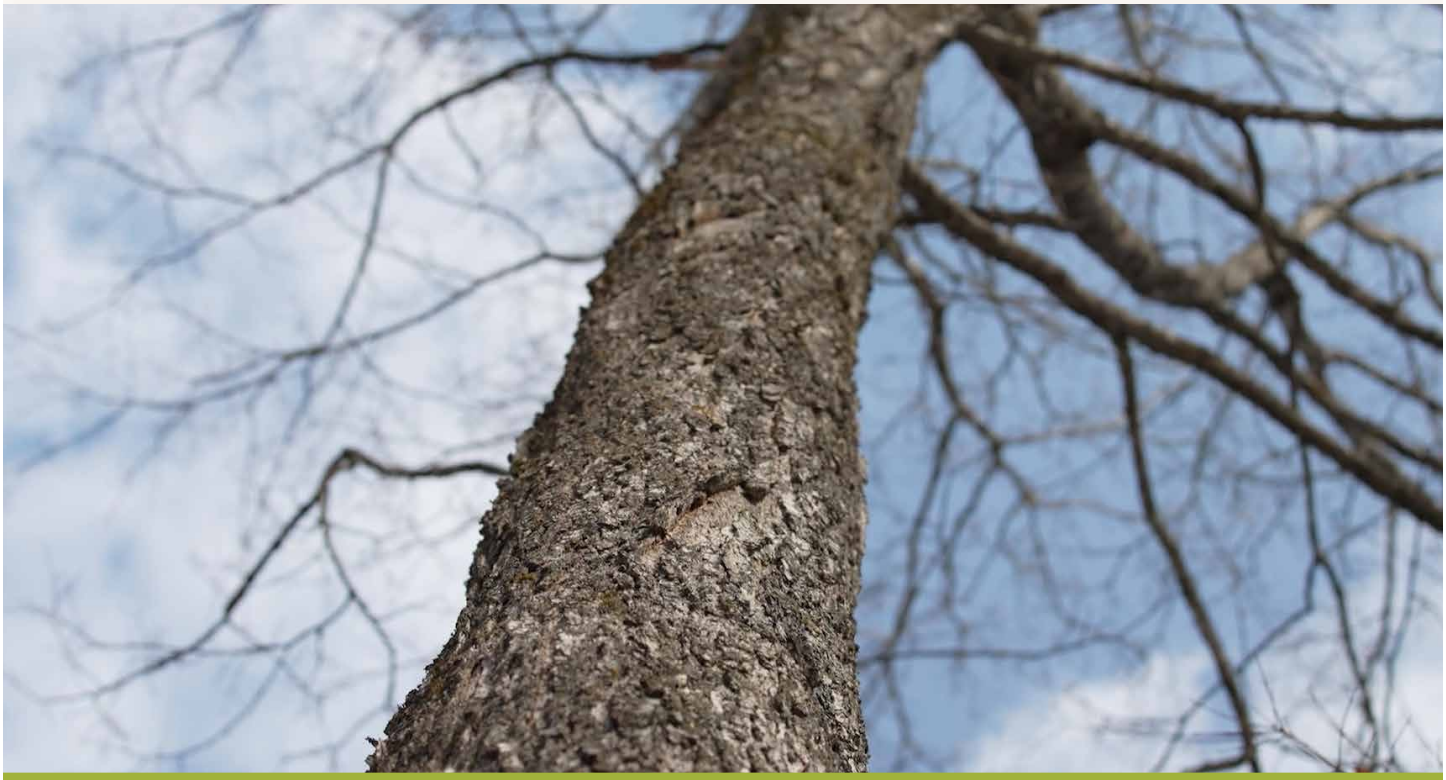
Silviculture examines the natural dynamics of a forest such as disturbance, changes over time, and structure. Silviculture prescriptions are guided by land objectives and ecological principles. It is essential for forest professionals to understand the natural dynamics of a forest when developing a silviculture prescription. UW – Stevens Point is utilizing **Ecological sylviculture** not only to sustain wood production but also focusing on how ecosystems respond to management and how to sustain favorable outcomes. This practice prioritizes management practices that maintain all structures and functions of a forest, not only those that prioritize wood production. This practice emphasizes **heterogeneity,** complexity, and understanding how a forest evolved over time. Ecological silviculture supports

suitability because it often results in being able to manage ecological resilience. There are four operating principles of ecological silviculture.

1. **Continuity-provision:** This considers what is left behind during silvicultural interventions. This principle examines what is left behind for forest development and evolution and how this influences different processes. Some of those processes: Recovery post disturbance, sustainability, carbon stock levels, etc.
2. **Complexity/diversity**: This recognizes that natural ecosystems have evolved with disturbances that result in complexity in tree growth and life cycles composition of trees, and density. This considers how those dynamics can be mimicked in silvicultural prescriptions.
3. **Timing-apply:** This considers how management is planned. Considers timeframes that are appropriate to sustain and restore specific functions.
4. **Context:** Considering how decisions at stand level impact ecological systems and dynamics such as structure and function over time and space.

Ecological silviculture focuses on working with and not against the natural ecological system of a forest. Deploying this practice requires proactivity, adaptability, and consideration when implementing disturbance. This practice helps professionals develop prescriptions that are useful for addressing new and emerging challenges in landscapes. (D'Amato, 2025)

Ecological monitoring is a scientific tool important to ecological management and conservation. This involves taking repetitive systemic measurements overtime on environmental conditions using the same methods in the same places over time. This allows for long-term data to be collected and compared. This practice is important as it allows scientists to understand the change that occurs over time to an ecosystem. (University of Wisconsin – Madison Arboretum)



ACADEMIC RESEARCH AND PARTNERSHIPS TO ADVANCE SUSTAINABLE FORESTRY

The Wisconsin Institute for Sustainable Technology (WIST) at the University of Wisconsin – Stevens Point received a $4 million grant in 2024, to develop forest product innovations. This grant has value not only for the UW- Stevens Point and the forestry sector, but also for the state of Wisconsin, as forestry is at the center of Wisconsin's economy and environment. WIST was awarded this grant from the WI Economic Development Corporation (WEDC). This grant has allowed WIST to increase staff, enhance their lab, and conduct advanced research on compostable materials and plant growth applications. This grant plans to find solutions to current challenges within the forest products industry that are currently worth $24.4 billion. This industry is Wisconsin's fourth largest manufacturing sector, making it essential to the state's economy.

This partnership is supporting WIST's innovations that help to rejuvenate forest product economic centers, especially underused pulp, fiber resources and packaging and tissue production. Partnerships like this are helping WIST become a resource for composability and recyclability testing in fiber-based products. This work helps WIST to be a resource for businesses, providing data that will allow them to make informed decisions on product development and market entry.
(Wisconsin Institute for Sustainable Technology, UW-Stevens Point)

References

For additional information:

- USDA Forest Service
- Plant and Soil Sciences eLibrary
- D'Amato, 2025
- University of Wisconsin – Madison Arboretum
- Wisconsin Institute for Sustainable Technology, UW-Stevens Point)

Additional Resources from LEAF: Wisconsin's K-12 Forestry Education Program:

LEAF-Wisconsin's K-12 Forestry Education Program
College of Natural Resources
University of Wisconsin-Stevens Point

- Lesson 1: American Indians and the Forest
- Lesson 7: Sustaining Our Forests
- Career Profile - McKaylee Duquain
- **Wisconsin Forest Tales**
- K-1st Grade Field Enhancement - Sensing the Forest
- 2nd-3rd Grade Field Enhancement - Observing Forest Interactions
- 4th Grade Field Enhancement - Unlocking a Forest's Past
- 5th-6th Grade Field Enhancement - Studying Forest Layers
- 5th-6th Grade Field Enhancement - Woods Worth
- 5th-6th Grade Field Enhancement - Competition in the Forest