

These Trees Tell a Story
Course Integration

These Trees Tell a Story (Charney 2023) is designed to be used as a narrative companion text to inspire students in general courses on Ecology, Environmental Science, Conservation, or related disciplines. These activities build students' skills in inquiry and problem solving, while giving them an introduction to plant identification and basic environmental processes. The specific topics covered in the book include geology, forest ecology, wildlife biology, soil processes, evolution, conservation, and others (Table 1). The activities below could form a small portion of the coursework (incorporating a few chapters and relying on Activity 3 for homework) or could form a large portion of the coursework (incorporating all of the chapters and relying on Activity 4 for homework).

Week 1.

In Class: Introduce *These Trees Tell a Story* and purpose of using this book as a component of course. Form small groups for working through problems throughout the semester.

Homework: Read Chapter 1.

Week 2.

In Class: Provide students a brief introduction to some of the basics of plant identification – such as leaf shape and opposite versus alternate branching patterns. Optionally, you may give access to the following field guides to supplement online resources:

Physical Guides:

- Petrides GA & Wehr J. 1988. *A Field Guide to Eastern Trees: Eastern United States and Canada*. Peterson Field Guide Series. Houghton Mifflin.
- Newcomb L. 1977. *Newcomb's Wildflower Guide*. Little, Brown.
- Wessels T. 1997. *Reading the Forested Landscape. A Natural History of New England*. Countryman Press. **–The Indicator Species section in back of this book is particularly useful.**

Homework: Complete Activity 1 (Species Checklist) to be completed in small groups. This may be started in class.

Weeks 3 through 13.

Chapters 2 through 10 could each be used for a week of learning. However, instructors may choose to do fewer chapters/weeks, depending on the course structure.

In Class: Give students time each week to work in groups on Activity 2 (Inquiry Brainstorming) for the focal chapter.

Homework: Read the focal chapter and complete either Activity 3 (simple Reflection on Reading) or Activity 4 (more in-depth Investigation of Home Site).

Table 1. Main topics covered in each chapter of *These Trees Tell a Story*.

Chapter	Topics
1. Home	Urban Ecology, Desert Ecology, Ecological Footprint.
2. Land	Soil Nutrients, Bedrock Geology, Navigation, Eastern Forests, Aspect, Chestnut Blight.
3. Water	Ecological Succession, Conservation, Surficial Geology, Glacial Deposits, Sorting, Weathering, Fire, Pine Barrens, Indiana Dunes.
4. Context	Hydrology, Surficial Geology, Glacial Deposits, Maps, Forested Wetland, Beech Bark Disease, Animal Signs.
5. Change	Meandering River, Riparian Forest, Forest Edge, Endangered Species, Landscape Stability, Salmon, Tiger Beetles.
6. Chemicals	Biogeography, Salt Marsh Ecology, Tides, Evolution, Biogeochemistry, Nutrient Cycling, Competition, Tolerance, Pattern, Smell, DDT.
7. Elevation	Boreal, Alpine, Subalpine, Tundra, Fire, Soil Nutrients.
8. Disturbance	Disturbance, Wind Storms, Old Growth, Aspect, Hemlock Woolly Adelgid, Porcupines, Navigation.
9. Relics	Peatland, Hydrology, Paleoecology, Metapopulations, Island Biogeography, Connectivity.
10. Aliens	Conservation Values, Abandoned Orchard, Succession, Invasive Species, Animal Tracking, Bird Language, Various Mammals.

Activity 1. Species Checklist.

Working with your group, develop a table or list containing key identifying characteristics and key habitat requirements for each of the trees and forbs listed in the “Species Checklist” at the beginning of Charney (2023). Use the online resources listed below, any field guides provided by your instructor, and other resources you have access to. Which of the species are considered indicators of site conditions and what do they indicate (for example, soil moisture, pH levels, nutrient requirements)? Learn to identify each of the species in your list. You may also be asked to learn some of the species in the other groups of the Species Checklist. The table template below is a suggested format, though other formats could be used, and you will need more rows for your group.

Online Resources:

- Forest Trees of Maine Centennial Edition,
https://www.maine.gov/dacf/mfs/publications/handbooks_guides/forest_trees/index.html
- GoBotany, <https://gobotany.nativeplanttrust.org/>

<i>Species</i>	<i>Identifying Characteristics</i>	<i>Habitat Requirements</i>

Activity 2. Inquiry Brainstorming.

*Note: The goal is for students to do this activity for a chapter of These Trees Tell a Story **before** reading the chapter. If you happen to have already read the chapter we are working on this week, then your job is to help guide the group discussion without giving away the answers you've learned. See what other plausible patterns or theories you could come up with and ways to test them that weren't discussed in the chapter. There are many things in the images that were not written about in the book. You will not be graded based on whether you get the "right" answer, but rather on how well your group works together to produce thoughtful responses.*

1. With your group, identify any visual patterns, such as left-right color gradients, striking features of the landscape, structural characteristics of the forest, or other patterns. Write a short sentence about each pattern identified.
2. Identify all the species in the image that you can, using the Species Checklist and the table you made at the beginning of the semester. List these species and note how they relate to the patterns described in #1.
3. Examine the habitat requirements of the identified species, checking for any that are indicators that might explain some of the ecosystems or patterns. Write a short sentence or two summarizing these findings.
4. Write two to three sentences describing the nature of this ecosystem – what kind of habitat is this? What are its major defining attributes? What are the important values that humans might associate with this ecosystem?
5. Talk through with your group members what processes might be driving the patterns defined in #1. For each theory you come up with write one brief sentence describing the underlying process that might have caused the pattern and a follow sentence describing the evidence you would collect in the field to test this theory.

Activity 3. Reading Reflection.

After you have read this week's chapter of These Trees Tell a Story, write a short paragraph reflecting on what you learned. How well did your group's brainstorming session match what was discussed in the chapter? What surprising insights will stick with you? What in the chapter was difficult to follow? Is there anything you disagree with in the chapter? Did anything particularly resonate with you? How might this chapter change the way you perceive the world around you?

Activity 4. Investigating Your Home Site.

After reading Chapter 1 of These Trees Tell a Story, choose a "home site" that you want to investigate and consider from many different angles throughout the semester. Each chapter in the book ends with a series of questions about your home site. After you read each chapter, investigate the answers to these questions. This may entail visiting your site each week, conducting research online or in the library, and speaking with faculty or other experts about the local geology and ecology. Then for each prompt at the end of the chapter, write a paragraph about your discoveries.