I have been teaching “Reading the landscape” as an approach to natural history since 1976. During that time, I have worked with people of all ages, from third graders to graduate students to environmental professionals. Regardless of age, it is a process that allows people to more deeply connect with their local landscape. It also effortlessly integrates the studies of nature, history, and self into a unified whole that serves as a useful foundation for a place-based curriculum. Only when we understand the heritage of the land, the linkages between culture and nature, and are able to interpret that heritage, does a real sense of place become possible.

Let me give an example. I live in the southeastern portion of Vermont and frequently drive through Massachusetts to visit family in Connecticut. For years as I made that drive, I missed an obvious pattern. The names of the Connecticut River towns through which I travel all share the same ending—Northfield, Greenfield, Deerfield, Hatfield, Springfield, Enfield. Why were there all these “fields” in the Connecticut River valley? Eight years ago I learned that during the seventeenth century, these towns were all established on intervals—areas cleared of forest (as much as a mile on either side of the river) by Native Americans who burned the land to increase wildlife habitat and berry production. My perception of the New England landscape has been significantly altered by my new understanding of its cultural history. Now when I drive through the valley, I can picture a precolonial Connecticut River bordered by extensive prairie, right in the heart of forested New England. This is just
one connection between culture and nature that has profoundly enriched my sense of place.

Several books are helpful in linking cultural history to the landscape. The one that most stands out in my mind is William Cronon's *Changes in the Land*. It authoritatively describes how changes in human culture induced dramatic alterations in the New England countryside. But Cronon never tells us how to see and interpret this history that is so visibly etched in New England's landscape. He doesn't teach people how to become historians of their own wooded surroundings. For the interpretation of landscape history we need to turn instead to the naturalists, with Henry David Thoreau leading the way.

Thoreau's best known for his sojourn at Walden Pond and his resulting reflective book. But few people realize that subsequent to this work he threw himself into a more formal study of natural history in an attempt to know all his plant and animal neighbors. In the process he became an accomplished ecologist. Thoreau was possibly the first natural historian to study plants in a way to understand a landscape's history. He was particularly interested in what his Concord, Massachusetts, environs looked like prior to British settlement. On his walks he would seek evidence from decaying stumps, the shapes of trees, and the composition of a forest to infer the grandeur of a lost wilderness. But like acorns cached by squirrels, Thoreau's observations were scattered throughout his journals, never coming together to create a coherent language—one people could use to learn to read landscape histories. Natural historians would have to wait another century before a teacher emerged to impart the language of the land.

In her 1964 book, *Reading the Landscape*, May Watts became the first person to teach people how to read a landscape the way we read books. She drove the point home with the title of her chapter on bogs—"History Book with Flexible Cover." The analogy to a history book is very appropriate, but reading the landscape is also like reading a mystery, since it involves sleuthing. Watts's book was an inspiration to me as a college senior at the University of New Hampshire. It was my first exposure to the natural history of landscapes as opposed to individual organisms. But I didn't really learn the process of reading the landscape until my graduate work at the University of Colorado under the tutelage of John W. Marr.

Marr would lead us into the foothill forests west of Boulder and have us seek clues about their history. I clearly remember one forest where many of the larger ponderosa pines had deep scars at the base of their trunks, all positioned on the uphill sides of the trees. We eventually found evidence that the forest had been burned, but we remained puzzled about the scars. Marr then took us to an adjacent forest that had been spared by the blaze and suggested we examine those trees. We found thick mats of needles, sticks and even some logs lying against the uphill sides of these trees, but the downhill sides were litter free. We quickly realized that the trees blocked the downward migration of forest litter, creating what Marr called "fuel pockets." The presence of the uphill basal scars in the burn became immediately clear, and I continue to use them as the best evidence of past forest fires. Ever since those studies, my attention has been fixed on the whole forest—and the fascinating stories it tells—rather than its individual trees.

Classroom teachers may be wondering, "But to read the landscape, don't you have to be able to identify plants?" Not necessarily, as we've seen in the example of the burn scars. In the case of a forested landscape, it's not as important what the particular species of plants are, but rather what they look like. Are trees growing up or out? Do they have a single trunk or a cluster of them? Are stumps present? These are the clues to culturally induced changes in a forested landscape. Yes, plants are the language of the landscape if you want to engage in a close reading. But even beginners can use the kind of evidence above to glean a synopsis of the same story.
Reading a Forested Landscape

ow let's see how the process of reading a forested landscape works. Imagine yourself walking through a northern white pine forest. The ground is level and even. The trees are roughly the same size, a bit more than a foot in diameter, with trunks that rise fifteen to twenty feet off the forest floor before dividing into many, large, upward-arching branches. You come to a tumbledown stone wall composed of rocks of all sizes, from ones as big as a large suitcase to those as small as a child's fist. You cross the wall and the terrain soon slopes moderately upward to a small ridgetop.

On this side of the wall the forest has many different species of trees, mostly broad-leaved deciduous trees, such as ash, maple, birch, and cherry. You notice that many of the deciduous trees have two or three trunks growing from one root system. On the top of the ridge you come upon a huge maple that has a massive trunk of more than four feet in diameter and large low limbs that grow out into the surrounding forest rather than up, as all the smaller trees do.

The clues within these paragraphs clearly detail the cultural history of this forested landscape. Now, let's figure it out. The stone wall separates forests that are dissimilar in their composition, telling us that each forest has a different history — a different story to tell — with the wall itself offering the first important clue. The wall tells us that at one time this land was cleared of its forest, but for what purpose? Although stone walls are often constructed in suburban landscapes to mark property boundaries, those found in rural landscapes were constructed to keep livestock either in or out of the open agricultural land they inscribed. Forests were cleared for agriculture for one of three reasons: to grow crops, to produce hay, or to create pastures for grazing animals. The size of the rocks in the wall is the clue that helps us determine which of these activities occurred on this now-forested land.

If you have ever tended a vegetable garden in a region of the country where the ground freezes during the winter, you might be able to guess what I am aiming at. Land that is free of vegetation during the winter produces an annual crop of stones that are brought to the surface by repeated cycles of freezing and thawing. Because soil that is full of stones is hard to turn, even if the stones are no larger than a fist, farmers remove them from cultivated plots, and what better place to put them than the stone fence protecting the crops? Stone fences containing numerous small rocks are a sure sign that adjacent land was used for cultivation. Fences composed solely of larger rocks were built to keep livestock either in pastures or out of hay fields — in both cases, the vegetative cover would not have allowed small stones to surface.

Since the deciduous forest grows on a slope while the pine forest is on level terrain, it makes the most sense to assume that the land under the pines was the cultivated site. And there is further evidence suggesting that the stone wall was built to keep pastured animals from getting into the cultivated area. How can we tell that the deciduous forest was once a pasture and not a hay field or another cultivated site?

The clue is the large maple on the ridgetop. Trees with this squat, wide-branched form grew in the open, free from the competition of surrounding trees. Trees growing in close proximity to other trees put their energy into growing toward the canopy to garner their share of limited sunlight. Trees growing in the open extend outward. A tree like this
maple never would have been left in a cultivated plot, where its roots would make turning the soil a nightmare, or in a mowing, where its shade would reduce the growth of hay. But it would be left to grow in a pasture to shade animals or a hot summer’s afternoon.

So we know that the forested landscape described above was once open agricultural land with a store wall protecting a cultivated plot from pastured livestock. But that is not all of the story. The multiple-trunked deciduous trees tell of a more recent chapter in this land’s history. The only way a tree becomes multiple-trunked is for the trunk to be killed while the root system is left alive. When this happens, the roots quickly send up a number of stump sprouts, a few of which eventually grow to tree-size. What could kill the above-ground portion of a tree and leave its root system vital? Either cutting or burning. There is one piece of evidence which suggests that these deciduous trees were logged and not killed by a fire.

To interpret this evidence, we may help to visualize how a multiple-trunked tree grows. Imagine you are looking down on a cut stump that has numerous young sprouts growing from the outer surface of its base. As the stump decays, the sprouts grow larger and bend away from each other to avoid competition for sunlight. In time the stump is gone and what remains are a number of trunks arranged in a radial pattern. If we connect the center of these trunks near ground level with an imaginary circle, we approximate the size of the original tree when it was cut.

To estimate the size of the original trees in this forest, we note that each trunk is ten inches wide, with more than a foot between trunks. Taking half of each trunk, plus the more than one foot between trunks, we see that the original trees were about two feet in diameter. Trees of this size are highly sought for saw timber, but would be fairly resistant to being heat-killed by a ground fire, making logging the more likely explanation.

The trees in this forested landscape also allow us to create a chronology of when the pasture and the cultivated site were allowed to return to forest. The pines on the cultivated site have an unusual growth form, their trunks rising fifteen to twenty feet off the forest floor and ending in an eruption of numerous, large, upward-arching branches. Pines, like all conifers, normally have a single straight trunk that reaches to their top. When these trees were young, something must have damaged the terminal shoots or leaders—the single, upright branch at the tree’s very top. The trunks of pines and other conifers grow skyward through the development of this shoot. If the terminal shoot is injured, the tier of lateral branches directly below it takes on the role of a new leader and the single trunk is replaced by multiple branches. It is likely that these trees’ terminal shoots were killed by the white pine weevil, a small insect that has a big impact on the growth of northeastern pines.

Weevils feed and lay their eggs in the terminal shoots of white pine. However, not any leader will do—the tree must be exposed to full sunlight and usually be less than forty feet tall. This ensures the weevils a warm and productive haven where their larvae can develop. The presence of weevil activity tells us that these pines grew up in the open and not under the shade of other trees, and since no stumps are visible, we can assume that the pines were the first trees to colonize the site. Their size suggests that people stopped cultivating the land thirty to forty years ago.

The trees in the former pasture speak of earlier abandonment. Since the multiple trunks of the deciduous trees are slightly smaller in diameter than the pines, they are probably
similar in age, suggesting the forest was logged about thirty to forty years ago too. The logging could have preceded the sale of the land, which might explain the abandonment of the cultivated site. We know that loggers removed trees about two feet in diameter, which at this size were at least eighty years old, so the pasture was allowed to revert to forest more than a century ago. The story this landscape tells is well known in many rural areas of the eastern United States, where farming families have steadily declined since the mid-1800s and forests have reclaimed the land.

**Curriculum Guide to Reading the Landscape’s History**

As we’ve seen, a rather involved cultural history of this now forested landscape can be puzzled out from the evidence left behind. To teach students these kinds of clues and how to use them to interpret landscape histories does not take a great deal of time, and the sleuthing that is required will hold their attention.

I have focused on reading forested landscapes because they offer a wide variety of evidence to work with, are often quite involved, and I know them well. A similar approach can be used to read the cultural histories of other landscapes such as grasslands and deserts that have supported agriculture or mining. In the absence of old structures like fencing, plant identification becomes more important as a way to interpret the history of these landscapes. For example, in the Sonoran Desert, dense stands of mesquite or cholla joint, are usually good indicators that land has been grazed since cattle disperse mesquite seeds and cholla joints, allowing these plants to proliferate in desert ecosystems where they would otherwise be less common. Those who will need to work with indicator species should seek out local farmers, who are often familiar with these plants and know what they signify in terms of past land use.

What follows is an outline for a curriculum formulated around the process of reading the landscape. It functions well as a complete unit, but I would encourage teachers to choose, modify, and create those activities that best fit their needs. The outline is meant to be a guide that can help teachers think in new ways about how to join the studies of history and nature within their own towns and cities. All the activities suggested are appropriate for upper elementary students through undergraduates.

The curriculum outlined serves as a natural way to integrate English, history, art, and science. But more importantly it develops sophisticated skills in close observation, hypothesis testing, conducting primary research, the effective use of field journals, cooperative and collaborative work—all of which culminate in an important resource for the greater community.

The curriculum has seven components that move from the study of a region’s landscape history to the development of an interpretive guide to the cultural history of a particular parcel of land within the school’s town or city:

1. An examination of the presettlement landscape of the region in which the school is sited and the major trends in its settlement history.

2. A tighter examination of the settlement history of the town or city.

3. An introduction to the clues needed to read the history of a region’s landscape.

4. Applying the skills for reading the landscape in the field.

5. Interpreting the cultural history of a local parcel of land that is used by the public.

6. Testing the interpretation through the use of historical documents and interviews.

7. Developing an interpretive guide to the cultural history of the parcel studied.
THE PRESETTLEMENT LANDSCAPES

The central theme of this curriculum is stories—stories of how the land has changed. I would start by having students, without any prior research, develop their own stories about what their regional landscape looked like when Native Americans were its sole human inhabitants. You may want to have them discuss their ideas in groups. You may want to have students develop their story from a particular perspective. You may want to have them sketch, paint, or create murals to accompany their stories. The key is to engage their imaginations in what their regional landscape looked like hundreds of years ago, and how native people interacted with it.

If I had been given this assignment as a sixth grader growing up in coastal Connecticut, my story would have featured moccasin Indians silently stalking deer through vast oak forests. This was a major theme of my imaginary play at that time. But no matter how hard I tried, my moccasined feet could never move through oak leaves in silence, and I often wondered how the Indians accomplished such a feat. That question might have led me to discover that the native tribe in coastal Connecticut used fire to keep their woodlands free of leaf litter and the understory of those forests open so they could quietly stalk game and hunt with bow and arrow.

If I had uncovered this information as a twelve year old, I would have been immediately hooked on the study of landscape history (and may have even found myself in big trouble for attempting to bum off the understory of our surrounding forest). Being engaged in this way, I would have eagerly wanted to know what the land was like and how it had changed. Once students reach this stage, they will be ready to embark on their own historical research of their region’s settlement history. If you have local areas that approximate what the land may have looked like—old-growth forests, remnants of prairie—a field trip may be helpful.

Working with your local librarian, you should have little trouble collecting books that give accounts of your region’s settlement history. Good examples for New England are Croton’s nonfictional Changes in the Land and Donald Hall’s fictional Old Home Day. Students can research works such as these and highlight findings that intrigue them, like Native American use of fire. Supplied with historical information, students can develop a new series of stories that relate to changes in their regional landscape. Their new stories should be shared in some way through readings, discussion groups, or even dramatizations.

Once the class has processed the second round of stories and developed a sense of how their regional landscape has changed, it will be time to sharpen the focus to the specific landscape history of your town or city.

THE SETTLEMENT OF YOUR TOWN OR CITY

This is the time for students to seek out primary resources. These can include the local historical society, town histories, old journals, old photographs, interviews with long-time residents, even town archives. Getting students in contact with these primary resources may involve time and travel, but the results will be meaningful.

You may want to have each student or group of students focus on different time periods or different uses of the land (logging, mining, or various forms of agriculture) and report on their findings. The class could then combine these findings to create a timeline of significant changes that have occurred in their local landscape.

After gaining an understanding of these changes, they will be ready to go out and look for the historical evidence that is etched in the land. Field trips to historic sites or buildings that directly relate to how the land was used will be beneficial. Visiting the site of an old mill that ground grain or sawed timber is a fine stepping stone to understanding the surrounding countryside. It also offers another opportunity for students to imagine and develop stories about what life was actually like for the early inhabitants of their town. What would it have been like to grow grain, separate it from the chaff, and haul it by oxen: to a water-powered mill to have it ground into flour?
CLUES FOR READING THE LANDSCAPE

To prepare students for reading the landscape, you could review the different historical uses of your regional landscape and have students brainstorm the kinds of evidence each use might have left behind. Or you could create a photo library of the many clues that will allow them to interpret landscape histories. The photos could include a series of different kinds of stone walls and fences, a series of trees with different shapes, a series of important indicator plants, and other pertinent evidence.

Working in groups, students could develop their own explanations about why the fences are different or why the trees have different shapes, and how these might serve as clues to reading landscape histories. For example, barbed-wire fencing was first developed around 1870, but since the fleece of sheep was getting entangled in the barbs, it was replaced with large-mesh rectangular fencing in sheep pastures. Some guiding questions—would the thick fleece of sheep necessitate fencing different from the kind used for cattle?—will help students think about the evidence.

A question I often ask my students when we first encounter barbed wire attached to trees in the forests is: “On which side of this barbed wire fence was the pasture?” After some debate, the class realizes that the fencing is stronger if the barbed wire is nailed to the pasture side of the trees so that livestock pressing against the wire push it into, and not away from, the trees that support it. By working with questions like these, students develop an analytical approach to interpreting clues that chronicle changes in the land. Later, after processing their ideas as a class, the students will be ready to apply their new knowledge to the field.

Wessels

INTO THE FIELD

As you move into the field, journaling will be critical as a means for students to record what they will observe, so classroom activities on the effective use of journals will be important. I remember taking a trip with a seventh-grade class before I had begun to incorporate the use of field journals. Groups of students raced through the woods, having a great time, but they only found the most obvious clues that the forest had to offer. The use of journals helps slow students down and provides the space for closer and more insightful observation.

By this point, you will need to have examined a number of sites and picked one with good evidence of past land use, and a history that is fairly clear so that students will have initial success with reading the landscape. For this first field trip in which they will test their newly honed sleuthing skills, I would recommend that students work in small groups. For younger students, a parent could be asked to accompany each group. The students’ task would be to seek clues of former land use, and record or sketch them in their journals.

After searching the forest for clues each group could develop their own hypotheses and stories about the forest’s history. The groups could then come together and share their ideas as a class and see if they agree on a common story. If they are successful, the class would be ready to embark on their central project. Or they may need more time to develop their field skills on other sites.

INTERPRETING A PARCEL OF LAND USED BY THE PUBLIC

The parcel need not be large if it has evidence of a number of different historical uses. If it is large, you can choose to focus on a section of it. For forested areas, ten to twenty acres should do. Is the evidence a: hand, not parcel size, that is most important. Ideally you want to choose a site that is representative of your region’s landscape history, has some good evidence of former land use, and is utilized by the public.

My best instructional site is only one acre, but it has clear
evidence of three separate timber harvests that span a period of
130 years. During the Civil War the parcel was cleared of a
forest of massive American chestnuts. Then around 1875 the
chestnuts were clearcut. They were spread into, and around
1915 the one-foot-diameter, multiple-trunked chestnuts were
salvaged as they died from chestnut blight. The forest then
became dominated by hemlocks, some of which were logged
around 1960. The evidence of all three clearings clearly remains
for students to unravel.

To start the project, I'd again divide the class into a number
of small groups. Initially, the groups will be engaged in a kind
of treasure hunt, each trying to find as much evidence of the
lands former history as they can. All members of a group
should have their own field journal, and a map of the parcel
that shows boundaries and major features. When
students discover any evidence of past land use, or even a fea-
ture that is puzzling, they should mark its approximate position
on the map and then sketch the evidence in their journal,
adding pertinent comments to further detail what they
observe. Journals will be the students' record of what they
find. They will repeatedly refer to them back in class, and use
them for the development of the interpretive guide.

After the modified treasure hunt, each group could transcribe
what they found onto a larger map back in the classroom. This map would be used by all the groups to construct
their interpretation of the parcel's history. Their task should be
to decide how many different human activities occurred on
the land and then develop a chronology of these uses. Each
group would then present their chronological story to the class
for consideration and discussion.

After all groups have reported, there will likely be agreement
on certain aspects of the land's history and disagreement
on others. For example, there is evidence of a fire in my
favorite instructional site, and students often debate about
whether the fire came before or after the salvaging of the mul-
tiple-trunked chestnuts. Disagreements may serve as the focus
for further field investigations, so look for evidence to further
support or reject the contested interpretations. When agree-
ment is reached on the parcel's history, the class will be ready
to test their interpretation.

TESTING THE CLASS INTERPRETATION

To test their landscape history, students will again need to refer
to historical documents, including town histories, old journals,
old photographs, past aerial photos, deed searches, and inter-
views with long-time residents. Each group could be assigned
one avenue to investigate, either interviews, deed searches, or
old photographs, and then present their findings to the whole
class. It will be the combination of these findings and their
own field-based sleuthing that will frame the story of the par-
cel's history and the development of the interpretive guide.

DEVELOPING THE INTERPRETIVE GUIDE

Because there are many approaches to producing an interpr-
etive guide, I won't try to prescribe any one in particular, but I
do have a few recommendations.

Working in groups, students should be responsible for
developing proposals regarding the form and content of the
guide. These can be shared with the class, and once a consen-
sus is reached, the teacher should then oversee the guide's
development. This may involve creating new work groups to
write text, transpose journal sketches that clearly display
important evidence, create the general design of the guide,
and develop its layout.

The guide could take any number of forms—a booklet to
be carried while walking the trail, or a kiosk at the start of the
trail that points out highlights of the parcel's cultural history.
It may be signage along the trail (however, signs are prone to
vandalism and require more maintenance). It could point out
evidence of former land use adjacent to an already established
trail, or a trail system may be developed that leads visitors to
pertinent sites. (The class need not create the trail if other
groups, clubs, or organizations in the school or town become
interested in the project.)
Whatever form the guide takes, it should tell a good story, be illustrated with sketches from the students' journals, and should pose questions that will make the visitor ponder the evidence. Rather than simply pointing out—"the squat, wide-branching tree was left to shade pastured livestock." The guide might ask, "Why is the shape of this large tree so different? What does it tell us about the past history of the land?" The answer can then be teased out. The guide is meant to open the eyes of local citizens to the dynamic history of their landscape, and peoples' eyes are opened more by questions than answers.

A class may wish to introduce the guide to the public through some form of opening ceremony. Students will have worked hard to get this far and they should be recognized for their efforts. Using local media, they could advertise the opening as an important community event. Students could take an active role in leading workshops on the region's cultural history, the process of producing the interpretive guide, or they might want to lead interpretive walks. However it is conducted, an opening ceremony would be important. It forms the critical link between the students, the community, and their cultural heritage. It should be a time for shared celebration.

Making It Happen

To implement all the suggested activities will take a good amount of classroom time. For middle and secondary schools, it may be necessary to integrate several courses to create blocks of time for field investigations. Just one classroom day a week or every other week could be dedicated to the above activities, so required content in each of the disciplines could still be covered. I found this to be a very successful model for scheduling when I worked at the Putney School in Vermont, where I was part of a teaching team that developed an integrated curriculum for juniors involving courses in ecology, American history, and American literature. Each course had ample time to cover required content, and yet we still had large blocks of time to effectively integrate the three courses.

Some teachers will wish to choose from the above activities, or add their own. For those who want to focus on the interpretive guide but can't commit to all the listed activities, I'd suggest dropping the first two. Any teacher wanting to tackle all the suggested activities will need to invest a good amount of preparation time (I'd suggest that planning start a year in advance). However, you need not do this all on your own. Every town or city will have ample resources to help you. At the very start contact your local historical society, town historian, or your local librarian. Enlist their help to gather books and primary documents about the region's and town's settlement history. If your town or city has a historical society ask for volunteers to help students conduct research. Getting residents on board will greatly reduce your own investment of time.

Next seek out your local naturalists. Try contacting a local chapter of the Audubon Society or similar organization, a nature center, a resident forester, biologists from a state university's extension service, or a regional conservation organization. All can help you quickly develop skills in reading the landscape and point you to pertinent resources and sites. They may even be enlisted as volunteers to help with field trips or scoping potential field sites. Be sure to contact the Natural Resources Conservation Service (formerly the Soil Conservation Service) to get aerial photos of your area, both old and recent. These resources will make your task easier and far richer.

If you need funds to help defray costs of field trips or to produce your interpretive guide, once again, don't be shy about asking for assistance. Garden clubs, historical societies, civic groups: like the Lions or Kiwanas Club, not to mention local businesses, all fund local projects like this one. You may be surprised just how much monetary support you will be able to
muster for a well-articulated, community-based project.

You will also need to begin your own research. Again your local librarian and naturalists will be most helpful here in suggesting books on your region’s settlement and natural history. The following book list contains the best resources with which I am familiar for linking culture to changes in the land. All are geared to regions east of the Mississippi, but, when linked with books of more regional focus, will still be helpful to anyone wanting to learn the process of reading the landscape. For regional natural history, I also find the Sierra Club Naturalist Guides to be quite good. Following the book list is an appendix from my book, Reading the Forested Landscape, on evidence that can be used to read forested landscapes in the Northeast.

Although developing a unit on reading cultural changes in the landscape demands an investment of your time and energy, I can assure you it will be well spent. The result will be a dynamic, integrated study that not only develops a wide array of skills, but links students and community members in meaningful ways to the stories told by their local landscapes.

---

**Reference Books:**


An excellent account of the Northeast’s rural landscape during the 18th and 19th centuries through an examination of stone walls. Richly illustrated.


The most authoritative book on the relationship between human culture and changing landscapes. Thoroughly researched.


The most comprehensive review of the changing landscape of the eastern United States. The introductory photo essay of the region’s original forest types is striking.


An accurate children’s book that follows the changes in the landscape of a New England town from the last ice age to its 1999 bicentennial.


The journal of a fourteen-year-old boy who moves from Madison to the northern wilds of Wisconsin. It serves as a wonderful model for linking close observation with journaling.


A children’s book that traces changes in the land from pre-settlement to a modern suburban community.
The first book to outline the grand changes that have taken place in New England’s landscape.

The ground-breaking book that explains how to read landscape histories throughout the United States.

A detailed account of how to read forest histories. Richly illustrated.

**Evidence of Former Disturbance in Forested Landscapes**

**FIRE**

❖ **Standing Dead Snags**
Conifers and oaks that are made rot-resistant by heat stand for many decades and are often silvery in appearance and free of fungi.

❖ **Discontinuity in Age Classes**
Fires often leave the overstory intact and create a vigorous understory but usually remove the mid-story trees. Logging will not do this; an age discontinuity can only be observed in forests with trees more than two feet in diameter.

❖ **Basal Fire Scar**
On a slope, triangular basal scars appear on the uphill sides of trees where fuel pockets formed. If trees are not on a slope, the scars will be randomly distributed.

❖ **Multiple Trunked Trees**
Many broad-leaved trees and some pines send up stump sprouts after their runks have been heat killed.

❖ **Charcoal**
After ten years charcoal is not very visible unless one digs in the soil, and even then it may not be found. Since certain fungi that grow on decaying sugar maple and beech look very much like charcoal, fire should always be verified by means other than just charcoal alone.

**PASTURING**

❖ **Stonewalls**
Constructed only with large stones, the presence of many fist-sized stones indicates past cultivation.

❖ **Barbed Wire**
Barbed wire was first used in the early 1870s. Its presence indicates pastures that were used in the last century.

❖ **Pasture Trees**
Wite, low-banching trees were left to shade livestock when woods were cleared. Thorny shrubs—hawthorns, barberry, and roses—all deter browsing.

❖ **Juniper**
This slow-growing, unpalatable shrub thrives on grazed land where grass would otherwise overtop and kill it. The only other sites in which it is commonly found are on rock outcrops and on poor coarse soils where herbaceous vegetation is lacking.

❖ **Weird Apples**
Apple trees that are highly contorted at the base and have many dead basal branches near the ground are a result of heavy browsing.

**LOGGING**

❖ **Multiple-Tunked Trees**
Many broad-leaved trees send up stump sprouts after they have been cut.
**Cut Stumps**
These stumps have a visible flat top.

**Opposing Basal Scars**
The skidding of logs damages the bases of trees on skidder roads, creating basal scars that face one another across the road and are often triangular in shape.

**Softwood Stumps**
Softwood stumps decay from the outside in.

**Rot-Resistant Hardwood Stumps**
These stumps decay from the inside out.

**BLIGHTS**

**Snags with Fungus**
Trees killed by blights (insect or fungal) are not rot-resistant and quickly develop 'wound.' The exceptions are American chestnut, and oaks—both are naturally rot-resistant.

**BEAVER ACTIVITY**

**Standing Dead Snags in Water**
Flooding kills trees, but the anaerobic conditions created by the flooding preserves the root systems allowing dead snags to remain standing for decades. These trees are usually conifers and birches.

**Beaver Cut Stumps**
Blond-colored stumps indicate beaver activity within the year, gray stumps were cut more than a year ago, and stumps with turkey-tail fungi growing on them were cut at least three years ago.

**Beaver Dens**
The first sign of beaver abandonment is a drop in water level below the top of the dam. Herbaceous vegetation growing on the pond side of the dam indicates abandonment of at least two months. Woody vegetation growing on the pond side indicates abandonment of at least two years.

**BLOW DOWNS**

**Downed Trees**
Trees all lying in the same direction indicate that they were blown down. Downed trees lying in all directions indicate that dead trees fell over at various times.

**Pillow and Cradle Topography**
When a live tree is blown over, its upended root can carry a lot of earth, creating a depression or “cradle” where it grew. When the tree and root system rot, the earth is dropped as a pile or “pillow” next to the cradle. Pillow and cradle topography lasts for hundreds of years.

**Nurse Log**
Most often hemlock trees growing in a line with exposed roots tracing the line indicate a former nurse log—a decaying log on which trees grow.