

May 19, 2008

Americans and Their Forests Exam 2

Credit:	Short answer questions	25 @ 3 points = 75 points
	Essay	25 points 25
	Total	100
	Extra credit	5

Handwriting is important – write carefully.

Please answer all parts of a question.

Please make sure you have answered the question I am asking.

Please explain your answer (“yes”, “no”, “ships”, “firewood”, etc. isn’t adequate).

I. Short answer (3 points apiece)

1. Between 1850 and 1880, southeastern Ohio was the leading source of iron in North America, an industry fueled by vast quantities of charcoal.
2. The Lake States consists of two zones: North and South. How do they differ with regard to

	North	South
Soils	spodosols: coarse, acid, nutrient poor	Alfisols: fine, not acid, nutrient rich
Growing season	<u>short, late</u>	<u>long, early</u>
Typical Trees	<u>white pine, hemlock, birch</u>	<u>oak, hickory, basswood, maple</u>

3. Alfisols tend to be fine-textured and therefore nutrient- rich, whereas Spodosols are coarse-textured and nutrient- poor.

4. What is “kerf” and why were circular saws bad for Lake States Forests?

Kerf is the groove made in a piece of wood by a saw. Circular saws in use in the Lake States had very wide kerfs, consuming 30-40% of a log. This led to very wasteful use of the timber resource.

5. Driving logs in the river is cheap because the river is free, but river driving also has drawbacks. List three important reasons why an alternative to river transport would be welcomed (i.e. what’s wrong with rivers?).

a. **_Access: can’t get to timber away from the river_____**

b. **_Weather: River driving depends on an undependable rain and snow_**

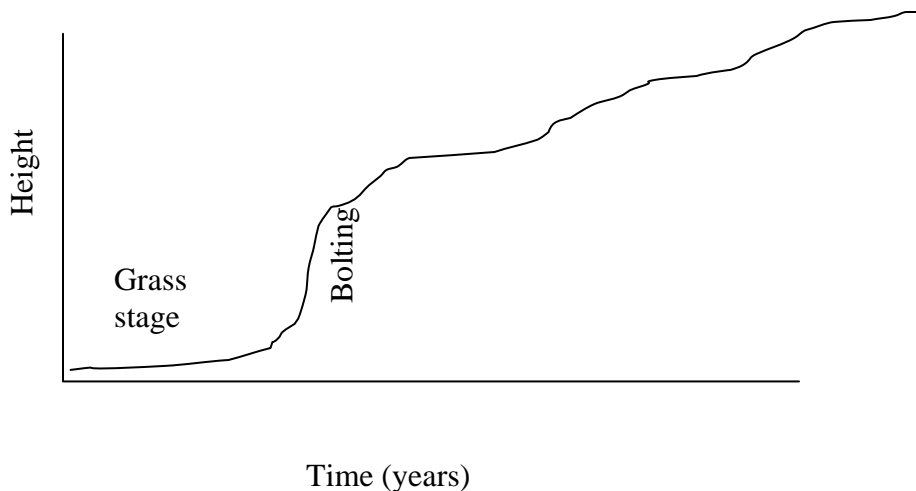
c. **_Loss: Much wood is lost in the river._____**

6. Most trees in the forest are of little commercial value (crooked, too small, wrong species, etc.). With this in mind, why did Lake States foresters practice clear cutting? Explain.

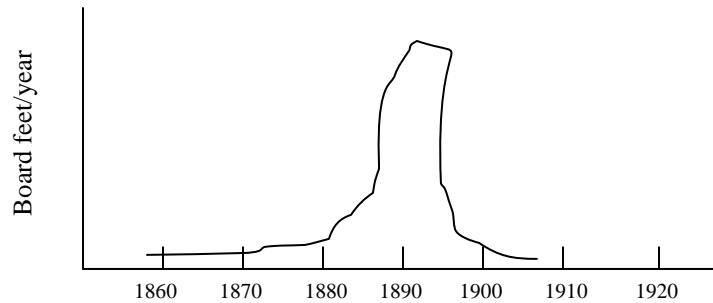
The great cost of building a rail line (which allows access to only a limited area) is much greater than the cost of hauling wood on the railway. The need to pay off the investment in the rail line drives lumber companies to cut everything within the small area near the railroad even though it may be of marginal value (i.e. crooked, small, wrong species, etc.)

7. How does the timing of growth adapt longleaf pine to fire? Write an answer, and draw a labeled graph of growth and time to illustrate your answer.

The growing tip moves quickly through the high temperature zone in a fire.



8. Draw the history of Lake States production on this graph.



9. Today, how can you tell that the Lake States were cutover more than 100 years ago?
Please explain.

Today large areas are occupied by birch and aspen, areas which naturally occur only in small areas cleared by natural disturbances such as fire or windstorms. The birch/aspen areas today were created by the human disturbance of clear cutting.

10. Who was Bernard Fernow, and what revolutionary idea did he bring to the American lumber industry (and why was this idea revolutionary)?

Bernard Fernow was the first director of the Division of Forestry. He came from Germany and had a degree in Forestry. He brought the idea of sustainable management of forests for continued production. This was revolutionary because all lumber companies at the time cut primary forest and then moved on (cut and run).

11. Why did profit-centered lumber companies like Pinchot's concept of "wise use"?

"Wise use" offered the promise of controlling wild variation in price of lumber which had previously been very damaging to the lumber industry.

12. What factors make fire so common on the Southern coastal plain?

a. **__ coarse soils drain quickly → dry vegetation _____**

b. **__ high frequency of lightning provides ignition sources ____**

13. Loblolly pine grows <adverb> slowly as a seedling and therefore is vulnerable to mortality from <noun> fire.

14. Define the concept of ecological succession as it applies to cutover forests.

Ecological succession is the process by which a forest community returns to a stand from which all the timber has been removed.

15. Railroads worked well for timber hauling in the South region because that region is generally flat, but poorly in the PNW region because that region is very mountainous/steep/hilly

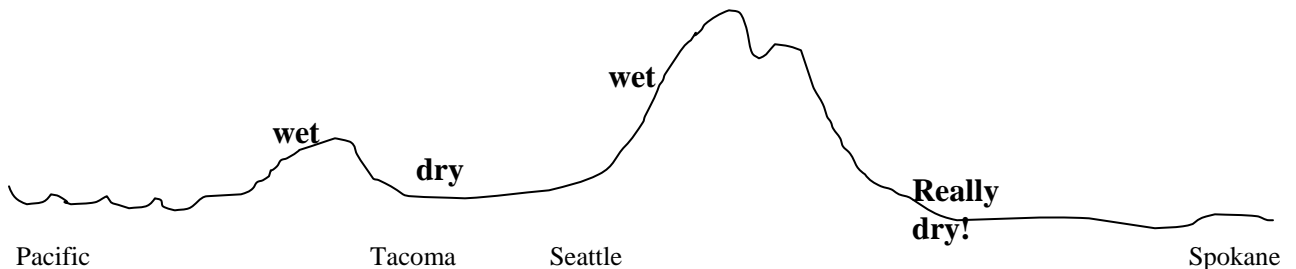
16. Where would you expect to find each of the following species?

Douglas fir PNW/Oregon/Washington

Pinus palustris South, Gulf Coast

Pinus strobus Lake States, New England, New York

17. This is a cross-section of Washington State. Clearly indicate and label the dry and wet areas.



18. Suggest three important geological/biological ways the timber regions of the PNW were different from those of the coastal plain South.

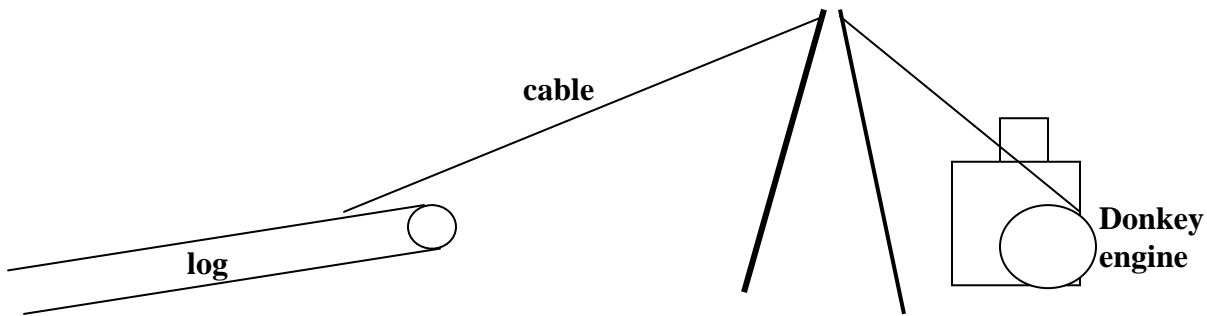
a. PNW is really steep

b. PNW is really wet

c. PNW has really big trees

19. How was steam used in yarding (skidding) in the South? Please explain. Draw a steam-driven yarding apparatus, and label the parts.

Trees were pulled with a cable and a large steam engine (dolbeer donkey engine) to a central point (a “yard”) near a narrow gauge rail line.



20. Suggest three ways forest fragmentation affects forest species in the PNW.

- ___ **Home ranges** _____
- ___ **Edges** _____
- ___ **Fish, destruction of old growth** _____

21. Explain why “undisturbed by humans” isn’t always a good definition of “old growth forest”.

- Humans have been part of many “old growth” ecosystems for thousands of years**
- Some forms of natural (i.e. nonhuman) disturbance are not consistent with our ideas of old growth**

22. How does cutting forest influence fish in forest streams? Suggest three ways:

- ___ **Sediment clogs gills; temperature rises → less O₂** _____
- ___ **Flash flooding; low water levels the rest of the time** _____
- ___ **Faster runoff; More runoff; less food** _____

23. Which specific requirement of the Endangered Species Act most annoyed the timber industry in the case of the Northern Spotted Owl? Why did it annoy them so much?

The requirement to protect habitat. This put old growth Douglas fir off-limits for cutting.

24. Decline of the PNW lumber industry in the '80s and '90s was caused by (check as appropriate)

- inaccessibility of remaining timber
- listing of the northern spotted owl as "endangered"
- competition with lumber from the Lake States
- depletion of timber on private land
- interfering California hippies
- lack of interest in Douglas fir

25. Small gasoline engines and electric motors allowed development of small logging machines (small relative to the days of steam). How did smallness influence the pattern of forest cutting? Explain.

Small = portable. Now it costs very little to reach an individual tree - we can cut a few trees and leave. Douglas fir can now be cut in small patches (staggered setting).

II. Essay (25 points)

Please answer one of the following questions. We will only grade one essay; no credit will be given for writing additional essays.

1. There is a great contrast between the physical environment of the north and south parts of the Lake States. Explain how this contrast shaped a) the human use of the land, and b) the character of the modern forest that resulted.

Important points:

Contrasts

- soil nutrients
- length of growing season

Human use

Southern Lake States

- homesteading
- farming
- fragmentation
- continuous land use to the present day

Northern Lake States

- no farming
- logging
- slash fires
- abandonment

Modern forest

Southern Lake States

- deciduous
- fragmented

Northern Lake States

- birch
- continuous

2. Many people were offended by the devastation left by the Lake States lumber boom, and formation of the National Forest Service may be seen as the result. Who were the important power holders and intellectual contributors and why did each think the Forest Service and National Forests would be a good thing?

Important players:

Aesthetic conservationists

- Forest Service will protect forest from cutting

Lumber companies

- Forest Service will damp down boom/bust cycles

Conscientious civil servants

- Forest Service will control theft of publicly owned timber resource

Western land owners

- Forest Service will protect water sources

3. There is almost as much forest in the South now as there ever was. But modern forest is much more species-poor than the pre-lumber boom forest. Speaking as a biologist, what factors have made the modern Southern forest species-poor? Please explain.

Loss of longleaf pine

Loss of light shuts down herb species

Loss of herb species shuts down herbivores (e.g. gopher tortoise)

Loss of burrowing animals shuts down species depending on them (e.g. gopher frog)

Loss of big trees excludes cavity nesters (e.g. RCW)

Fragmentation of savannah stops fire from spreading.

Loss of upland/lowland distinction promotes spread of disease

Plantation culture necessitates fire suppression

Loss of fire leads to loss of savannah

Extra credit (0.5 points each)

Please define the following in the context of forest history.

Dolbeer donkey **__Stationary steam engine used for skidding in the South__**

Log drive **__Moving logs to the mill in a river__**

Narrow gauge **__Small steam train used for moving logs to the mill__**

Blue ox **__Fictional character based on oxen used for skidding in the Lake States**

Cypress knee **__Extension of the roots of cypress which allow them to live in water**

University of Southern Mississippi **__University built on cheap clear-cut land__**

Boeing **__Early PNW timber company which branched out into airplanes__**

Earth First **__Conservation group employing civil disobedience**

Choke setting **__Putting a chain around a log so it can be pulled to the truck**

Tree sitting **__Form of protest of cutting old growth trees → media attention**

