Unit 4: Humans and the Landscape – Pre-Reading

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How Humans Have Affected the Landscape (of central Maryland)

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Ways to look at human impacts

- Energy use – more, changing sources
- Homogenization of global communities
- Expansion of European ecosystems (Alfred Crosby, 1986, *Ecological Imperialism*)
- Climate change
- Decline from the Golden Age
- My approach today – a history of changing landscapes

We have a lot of major organisms from Europe. Example: weeds came with crops. We brought over ways of moving animals around the landscape. Example: sheep – bring them up the mountain and down to the valley.

Our native animals – wild turkey, guinea pigs, bison, vicuna, Llama
New world agriculture was ruined by European. Example: brought fences, agriculture using crop rows.

The story of climate change is the story of energy use. Example: clearing forests.
Climate change: two phases - Medieval warm period and the little ice age period.
The story is that things have been going downhill since humans came along. But it is not all downhill, there are ups & downs.

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The broadest trend
(on the scale of centuries)

- A *forested* landscape in pre-European times (to about 1700 in central Maryland)
- An *agricultural* landscape for 250 years
- A *suburbanizing/reforesting* landscape for the last half-century

Landscape of Maryland
Central Maryland was 100% covered with forest pre-European.
We establish parklands.
Agriculture declined in Maryland and grew back into forests.

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Browse line, CATO
Land form around the Piedmont Region.
10 miles west of the Coastal Plain
In the transition zone from flat Coastal Plain to the Blue Ridge – then go into the Great Valley then up to the Appalachians plateau.

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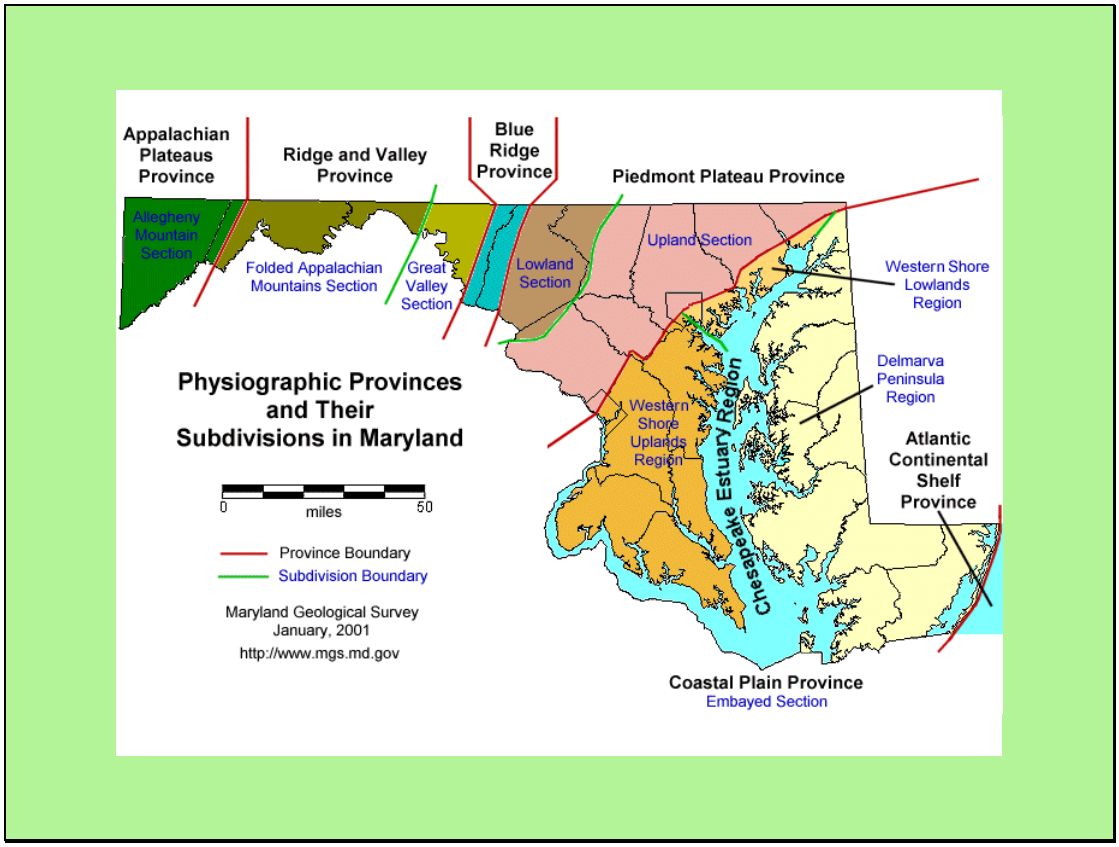

Maryland physiographic provinces:

- Mountains
- Piedmont
- Coastal Plain

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Early European Maryland – a Coastal Plain tobacco colony

This is an artist's conception of what Annapolis looked like in the 1600s.

From the start of European settlements in Maryland, the pressure on the woods began.
The mother country demanded the tall, straight pines for the King's ships, while the colonialists built settlements and cleared large tracts for cash crops, particularly tobacco.

Tobacco was easy to get to the water's edge where ships would pick it up. Maryland imported a lot of its food because the only crop being grown was tobacco. We imported glass, paintings, pets and ornamental plants.

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The Piedmont

The middle of the photo shows the northern extension of the fertile Shenandoah Valley, with larger farms.

After several decades we started settling the Piedmont by clearing forests and planting tobacco. But we had to start building roads to get crops to the water; so people started to grow wheat, barley, peas, beans and corn.

By the 1700s the Piedmont had a mixed population. 1690 slavery was important. Maryland was a boundary zone between the North & South that was not heavily settled by Native Americans. We did not have a high density of Native Americans. Native Americans were pushed out by European diseases.

Three major periods of change in the *disturbance regime*

- European settlement – 1730-1770
- Turn of the twentieth century – 1880-1920
- Suburbanization – 1950-?

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The pre-European forests

- Oaks predominant
  - White oak in the Piedmont and valleys
  - Chestnut and oaks in the mountains
  - Sycamore, river birch, box elder on the flood plains
- What kind of fire cycle?
- Wildlife included:
  - Bison
  - Elk
  - Wolves
  - Bear

The Piedmont was essentially a forested area. We have old land survey records from the Europeans. The Fire cycle – was practically nonexistent. We assume it was greater along the Coastal Plain.

There is wildlife that was here in the pre-European but some of it is not here anymore. Black bears had to be re-introduced. We have so many deer now because of the current habitat, landscape, parasites, predator free zones (parks) not the lack of large predators.

Can we ever get the same ecosystem back? Probably not. We have to reestablish the balance of nature that probably won't work in our area because of suburbia.

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European settlement period

- Clearing for agriculture, esp. in the Piedmont and the valleys
- Rural industries established: iron furnances, lime kilns (forest cutting for charcoal)
- Intensive hunting: wildlife declines and local extinctions
- Rapid decrease in forest cover

Iron furnaces used charcoal.
Lime kilns were used to make cement.
Elk and Bison disappeared.
Steady encroachment of farms, settlements.

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This is an artist impression of a European settlement. By the mid-eighteenth century, the rolling hills of the Piedmont were being turned into large, food-producing tracts.

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Here is a stream wandering through a field. With no buffer, the nutrients of the field, from animal waste or fertilizer runoff, will go rapidly into the water and this into the rivers and Chesapeake Bay.

Much of the pollution problems of these important waters result from too much nitrogen and phosphorus. There was deliberate channeling of the streams.

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This is Lime Kiln, south of Frederick, Maryland. Lime kilns demand charcoal.

The forest would be managed: cut oaks and allow them to re-sprout. Let sprouts grow up for 25-30 years then come back to original place and cut down again. This changed the form of the tree because it had lots of sprouts. Oaks, chestnuts re-sprouted well, the pines, maple, ash and cherry did not. Today we have all secondary forests.

Different species grow back from seed in cleared fields. Example: tulip poplar.

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Turn of the twentieth century

- Cutting of last areas of "primary" forest
- Decline of charcoal making for industries
- Farm abandonment
- The chestnut blight (about 1910-1915)

With the development of the railroad the last areas of primal forest were cut down. There was a decline in charcoal use because it was less efficient than coal. Farms were abandoned because they could not compete with the productivity of mid-western farms. People moved west, to Baltimore, moved off of the land and we had the beginnings of forest re-growth.

1904 chestnut blight was brought to the new world.
1910 -1915 – chestnut blight reached Maryland.

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This led to rampant, often devastating, clear cutting, even in remote parts of the state at the turn of the 20th century. What was not taken to the timber mills was cut and left there.

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Wildlife, too, was thought to be inexhaustible, and many species were all but eliminated by unregulated hunting. Even the white-tailed deer, so prevalent now in the East, has been re-introduced in many of the coastal regions of Maryland, as has the wild turkey.

There was a decline in "market hunting" where you could go into a city market and purchase meat from commercial hunters. Around the turn of the century that disappeared because of conservation efforts and people's ideas of hunting – food vs. hunting.

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Browse line, CATO
Old dead chestnut – see smaller sprouts, leaves.

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Suburbanization period

- Clearing for suburbs and speculation, esp. around Washington, Baltimore, Frederick, etc.
- Forest areas increasingly fragmented
- Increasing wildlife populations (e.g. deer)
- Fire control, increases of fire-sensitive species (e.g. red maple)
- Dogwood anthracnose
- Gypsy moth outbreaks
- Invasive species (e.g. stilt-grass, *Microstegium*)

The Suburbanization period is the middle of the 20th century, the period in which we still live (after Second World War). It is easy to live outside the city with our cars and extensive highway system.

Forests get fragmented. This is actually good for some species. Example: deer started coming into our backyards.

We had fire control "Smokey the bear." There were a number of important pest problems. Dogwood anthracnose – mid-late 20th century; gypsy moth was cyclical; invasive plants – garlic mustard and barberry.

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Sprawl

Urban sprawl, as in the suburban counties of Washington and Baltimore, tend to separate forests into isolated tracts, even when leaving a decent percentage of the land in trees. This can be just the wrong thing for many wildlife species, such as wild turkey, which range over large tracts during the year. This is the kind of habitat we had – stream valley parks, sub developments, mix of agriculture (subdivision next to farms).

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Floodplain of the Monocacy at the Rte. 85 bridge (Furnace Branch in foreground).
Example of stream valley forest. Mostly grown back.

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There are numerous state and federal programs to plant buffer strips to slow this runoff and filter the raw nutrients.

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Frederick Valley, along Rte. 85 S of Buckeystown.
Maryland still has substantial agriculture but not viable farms. They farm but there income from farming is insufficient to live on. So people work other jobs.

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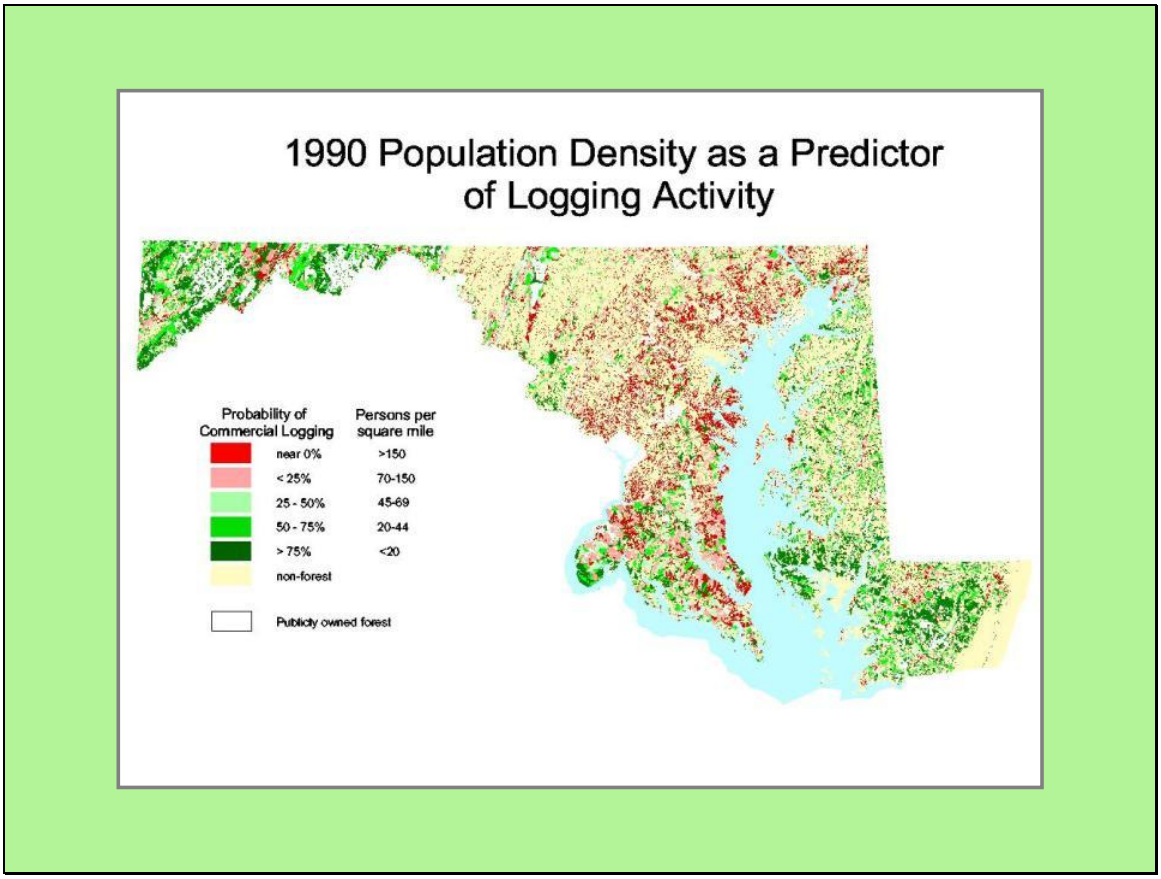

Forests and population density – showing Montgomery County Agricultural Reserve.
There is an interesting pattern – red are high density parts of Maryland. Its clear there is a band from Baltimore to Washington and up to Delaware. There is a densely populated band along the line (Piedmont & Coastal Plain).

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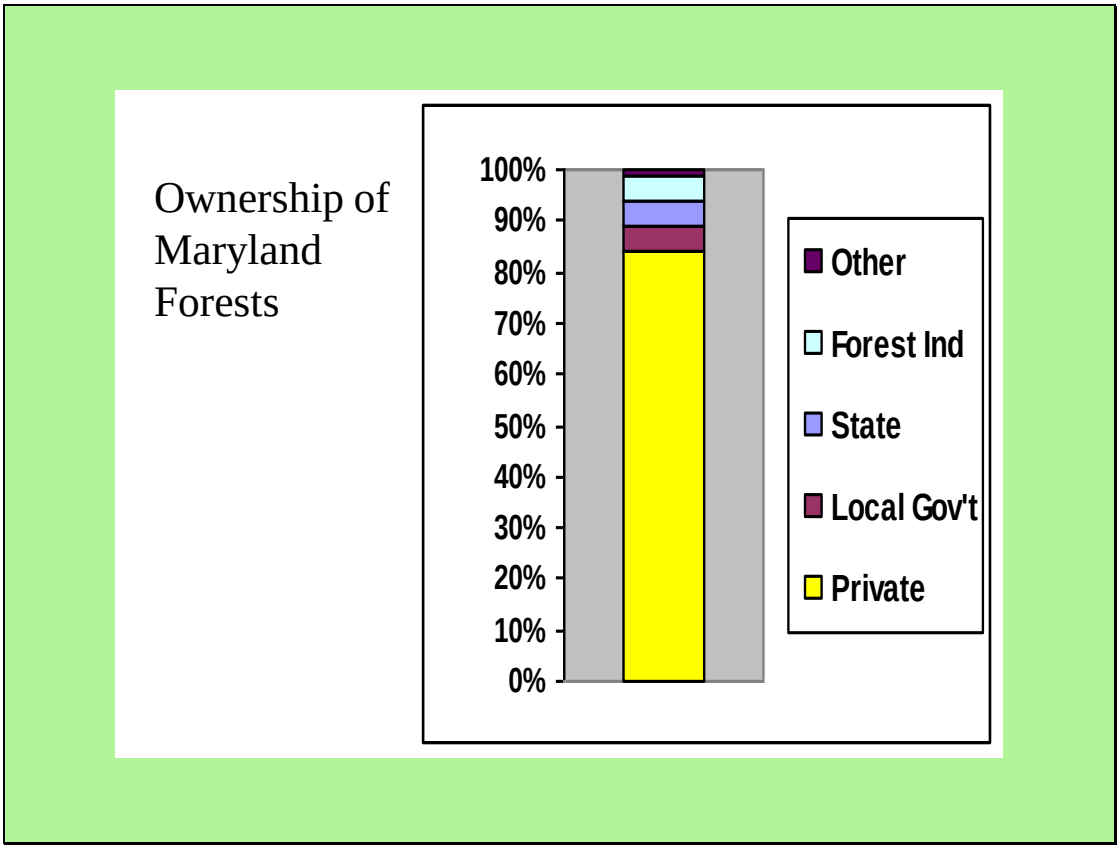

This graph shows who owns Maryland's Forests.
Currently most of the land in Maryland is privately owned.

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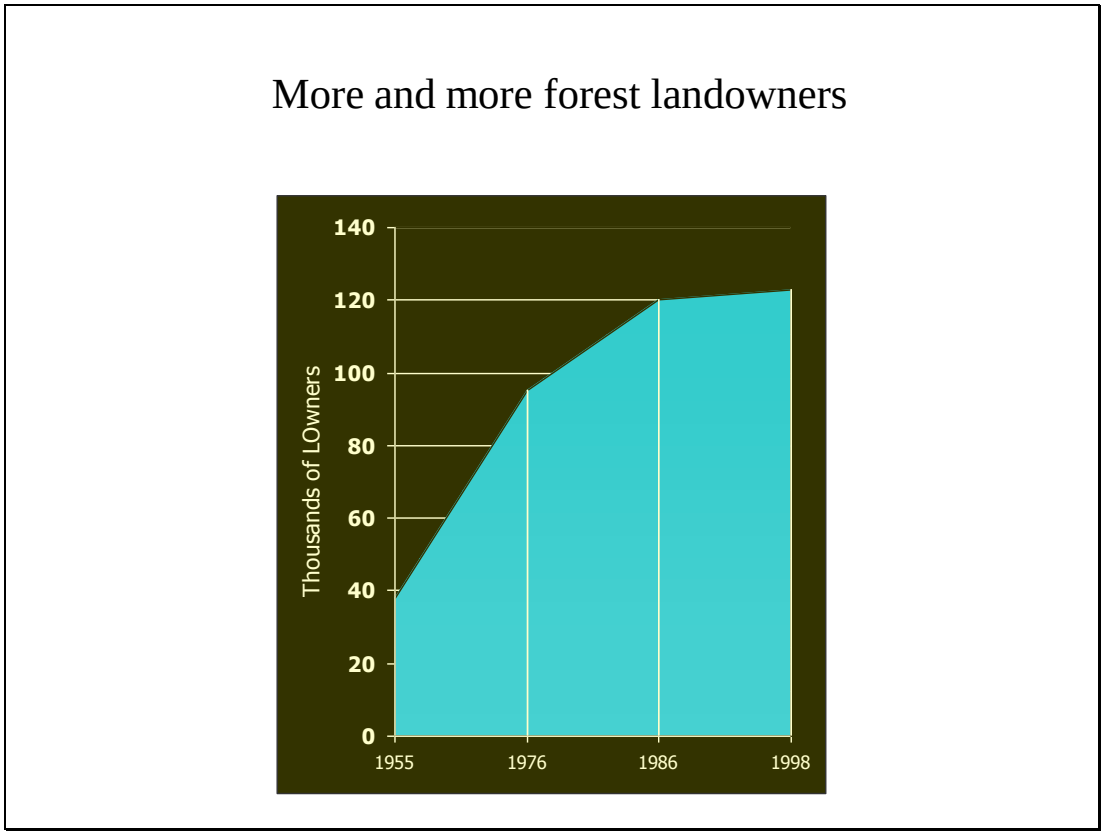

Shows how the number of forest owners is increasing but they own smaller amounts.

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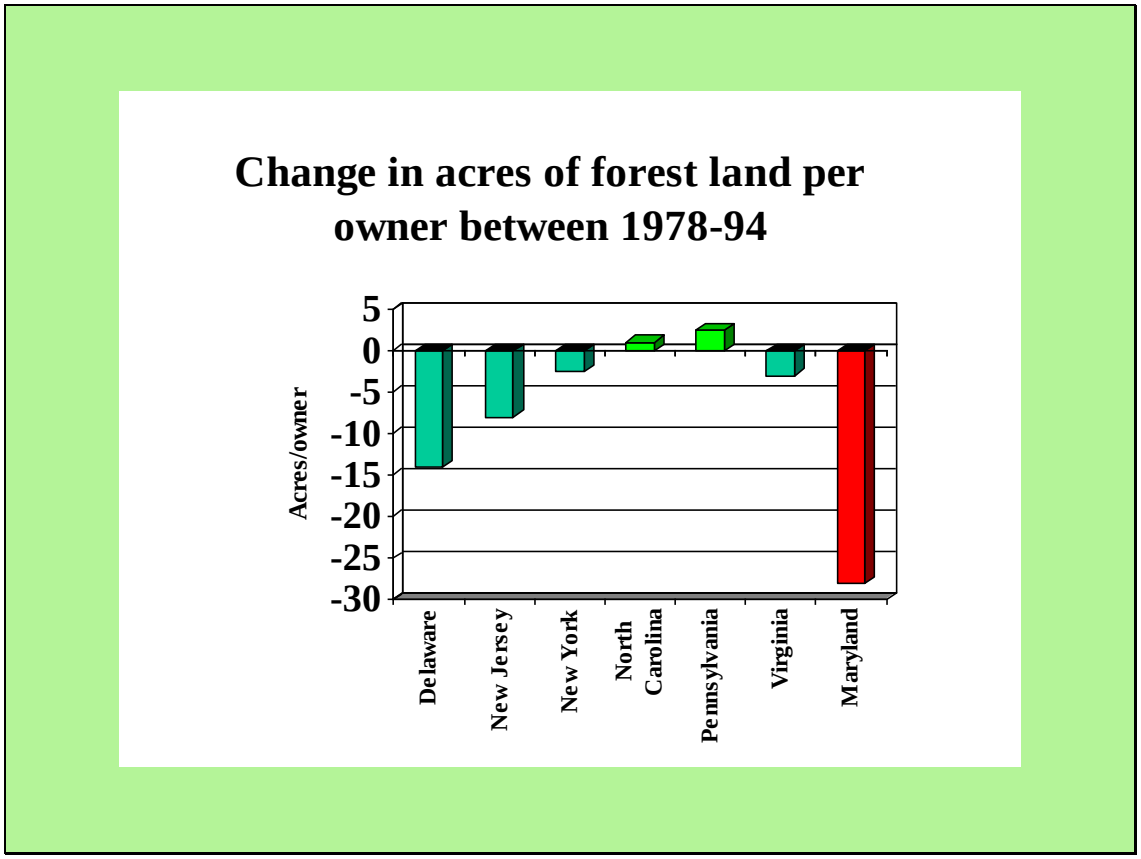

Decreasing acres of forest land/owner in Maryland, 78-94. MD has been dividing the forest land up into smaller ownerships: natural passage of generations, people moving into rural areas and buying land to build homes.

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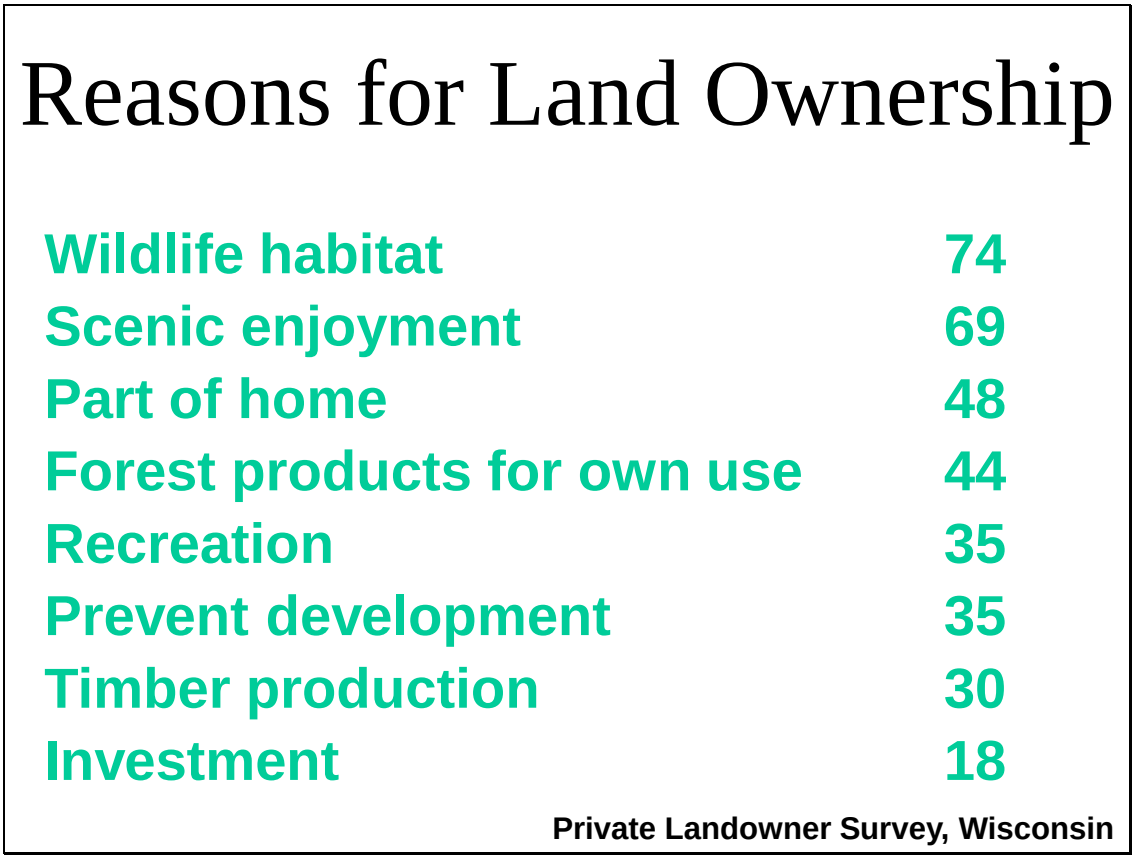

Reasons for Land Ownership - **Private Landowner Survey, Wisconsin.**

The reasons why people own land has really changed. The predominant reasons are no longer economic. Now it is due to consumption – things they like about the land. Example: wildlife.

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The red fox likes woods of all stages of succession. It typically enlarges an old woodchuck den for its own.

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Today's landscape

- New kinds of forests, never seen before
  - Decline of the oaks
  - Chestnut reduced to a shrub
  - Increases in red maple, black gum, sweet birch
  - 100-year-old tuliptrees with beech and maple below
- Wildlife increasing again
  - Deer very abundant
  - Coyote, bear entering the region
- Conservation – e.g. parks, riparian buffers
- Agriculture declining, becoming specialized
- Sprawl and fragmentation, even in the mountains

Today's forests

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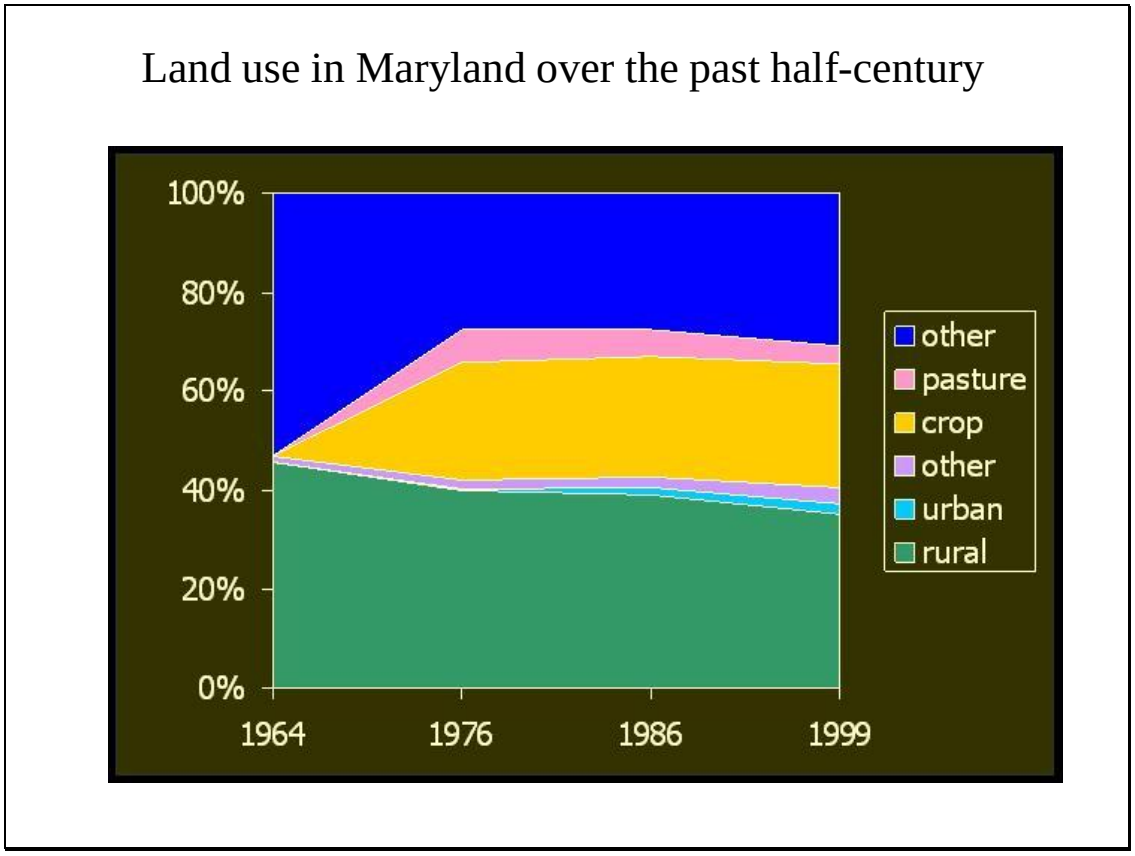

Land use in Maryland over the past half-century had been divided unto several categories. Most use being in rural areas and other personal usage.

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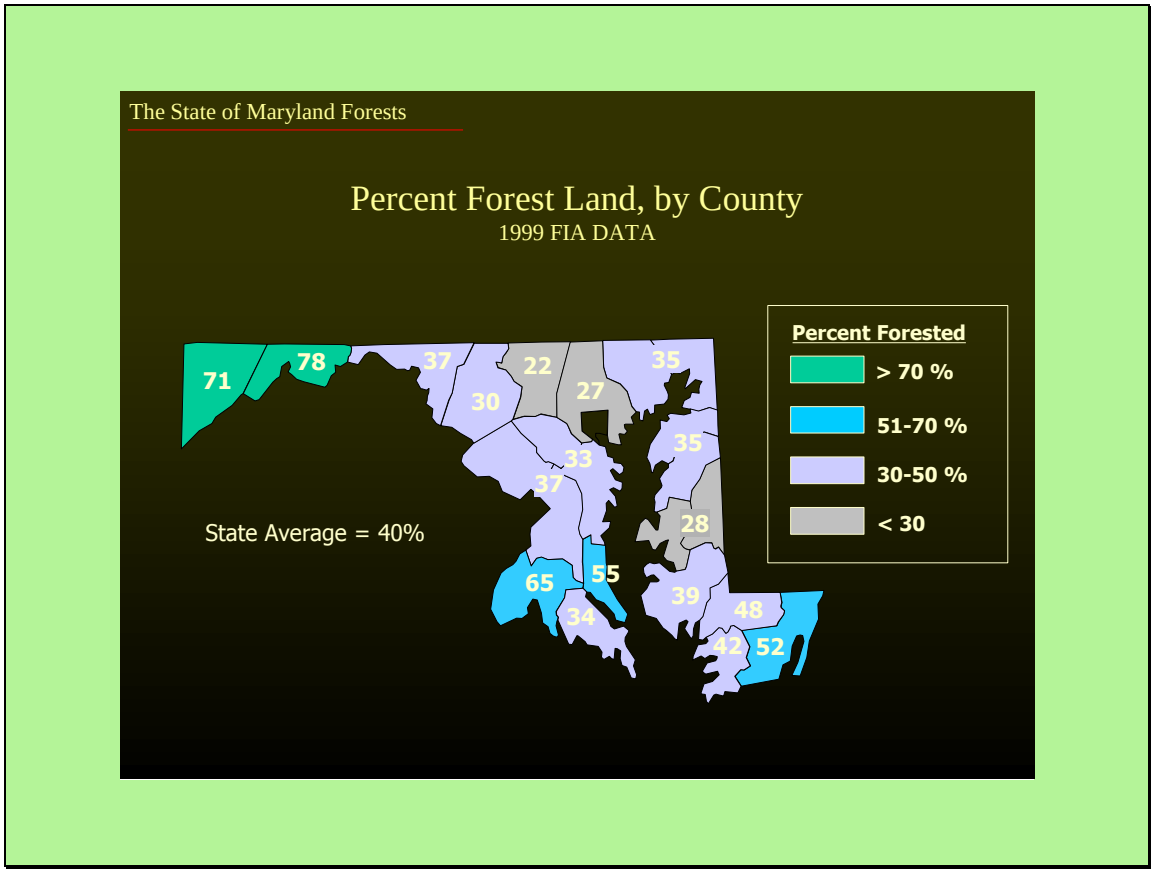

Percent forest land by county in Maryland in 1999.
Yellow poplar is the most common species in Maryland in 1999.

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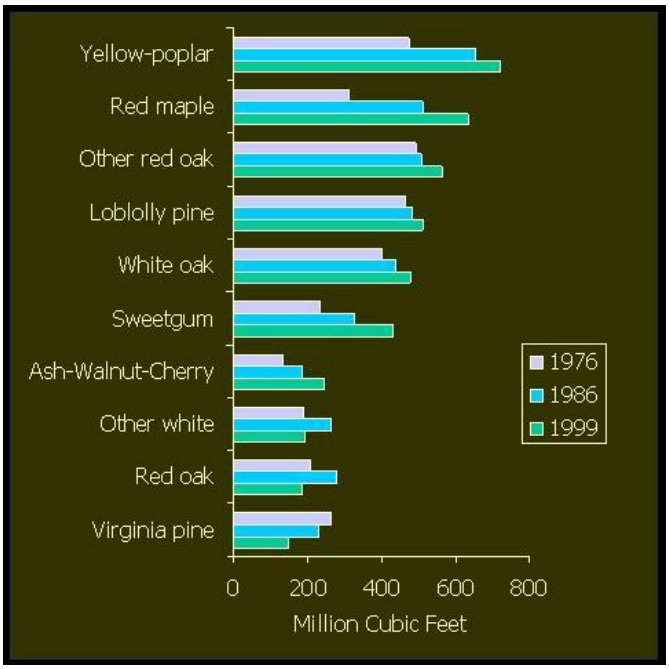
Maryland's forests – *not* "oak-hickory"



Example of our forest – dominant tree species in not like pre-European.

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Browse line, CATO

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Browse line, CATO. Two secondary species are tulip tree and black cherry.

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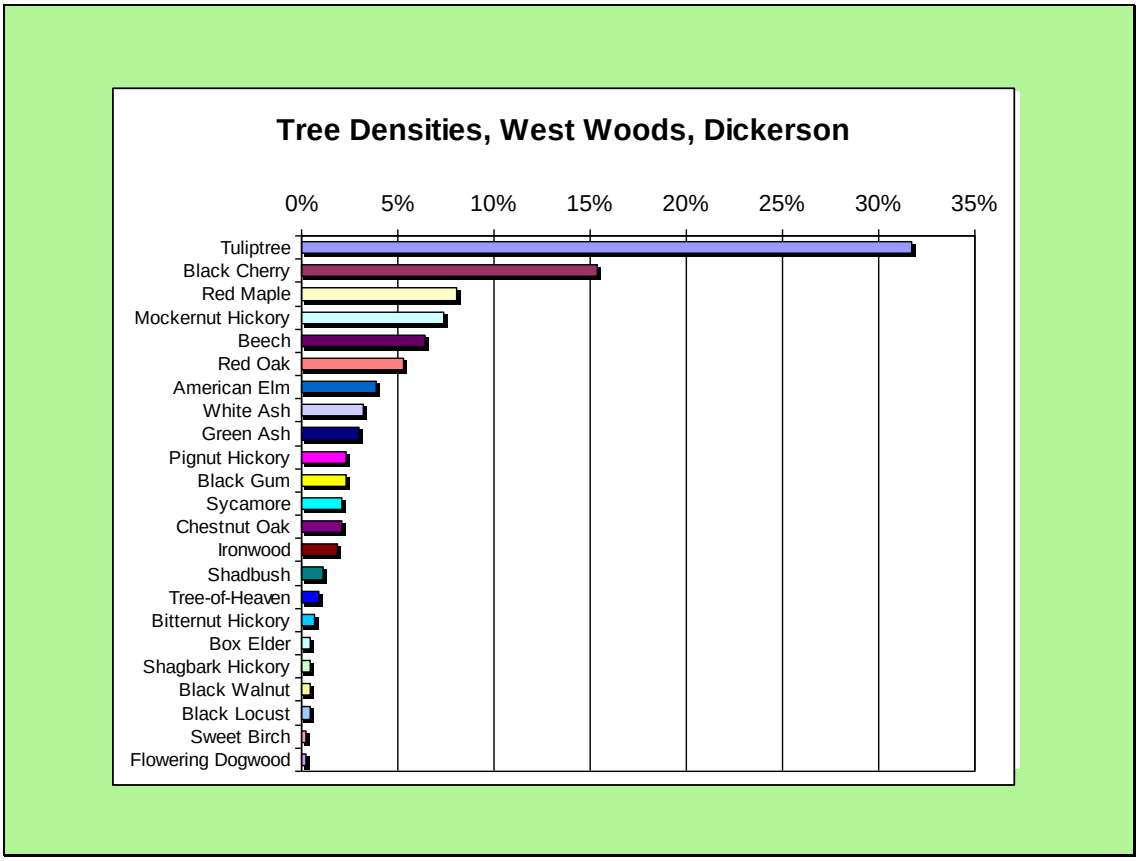

Browse line, CATO

The future landscape

- A mosaic of forest, farm and suburbia
- Rural landscapes controlled by non-rural people
- Aging forests, but different from those of the past
- Increasing wildlife – with some negative impacts
- A new way of living on the land?