



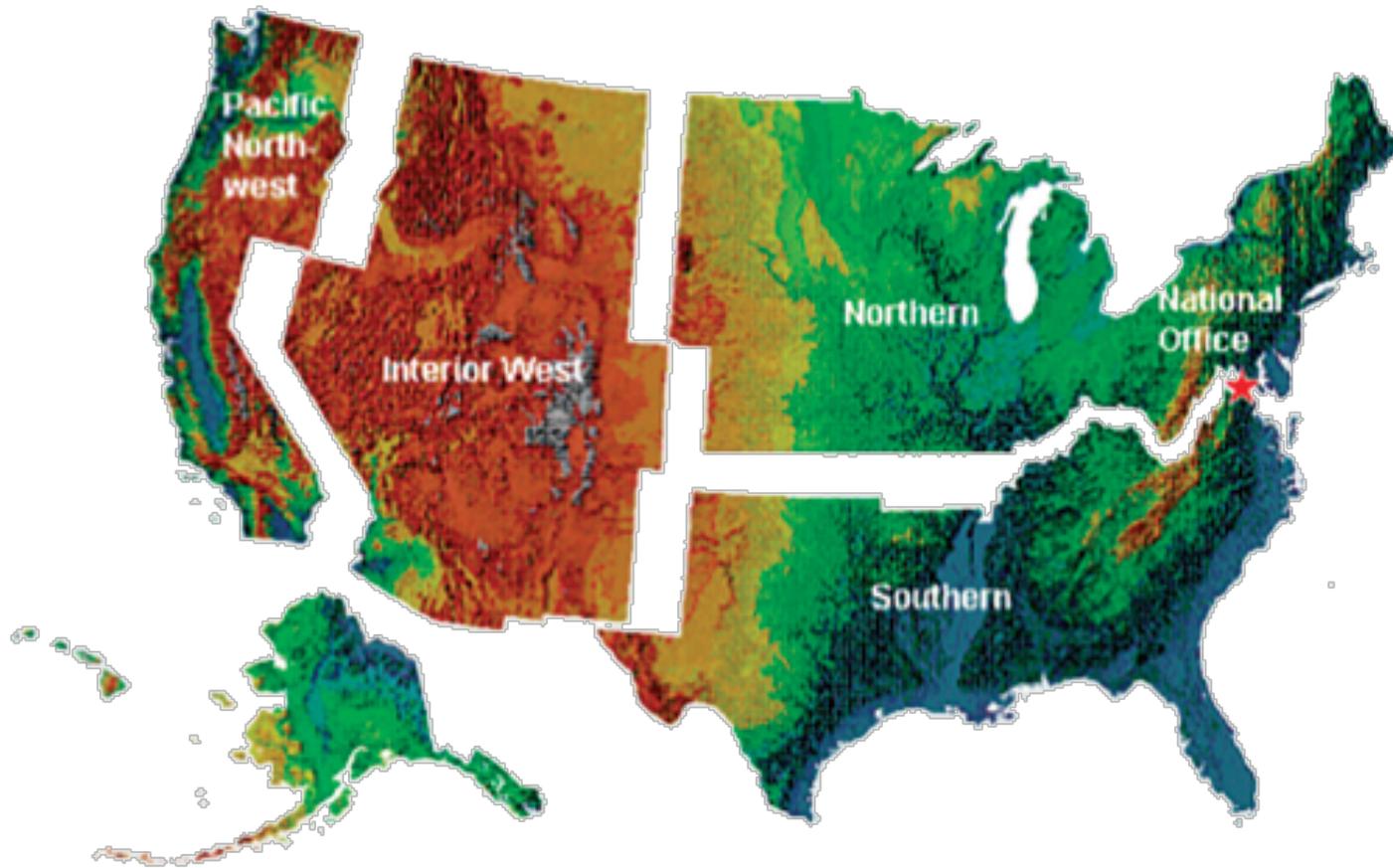
# Why?

- ▶ The Forest and Rangeland Renewable Resources Planning Act of 1974 mandates a report (RPA Assessment) on the conditions and trends of the Nation's renewable resources every ten years.
- ▶ The Forest Resources of the United States (FRA) supports this effort, as well as providing supporting statistics to the global Forest Resources Assessment.

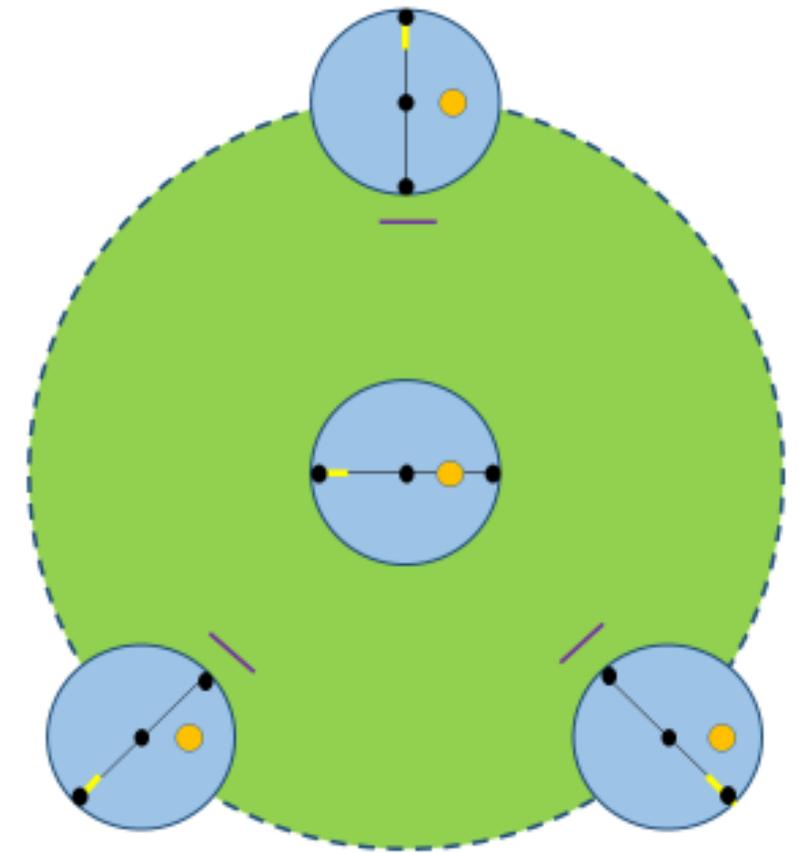
Who?



# What and Where?



FIA Regions (USDA Forest Service)



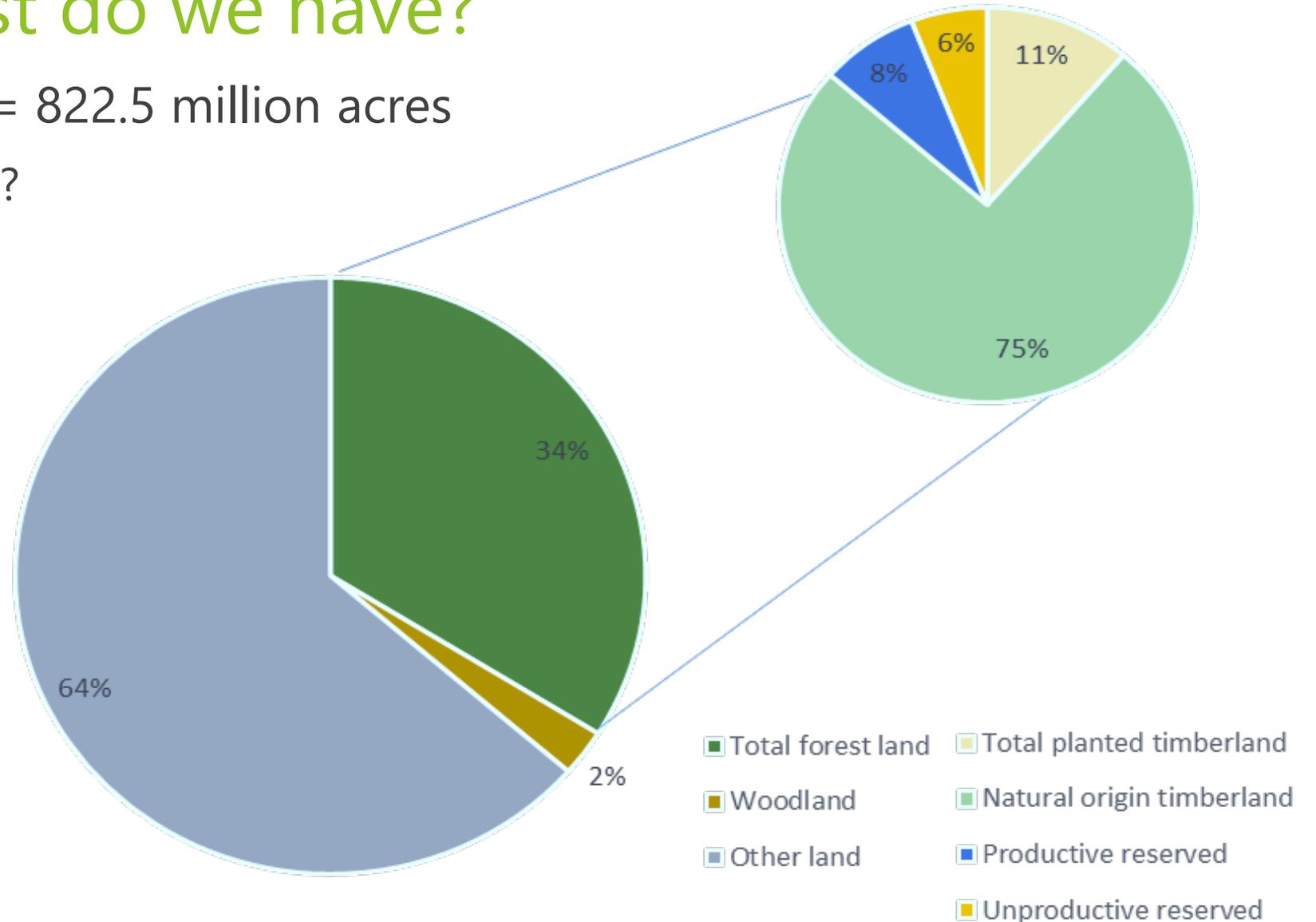
-  FIA subplot (crowns, damage, mortality, standing dead trees, vegetation, invasive plants, & browse impact) – 24.0 ft radius area
-  FIA microplot (regeneration) – 6.8 ft radius area
-  Lichen sampling area – 120.0 ft radius area
-  Soil sampling area – Point samples
-  Coarse woody debris transect – 24 ft transects
-  Fine woody debris transect – 10 ft transects
-  Litter and duff depth sampling area – Point samples



# How much forest do we have?

- ▶ Forests + Woodlands = 822.5 million acres
  - ▶ What's the difference?

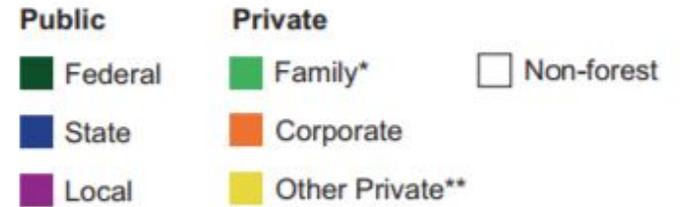
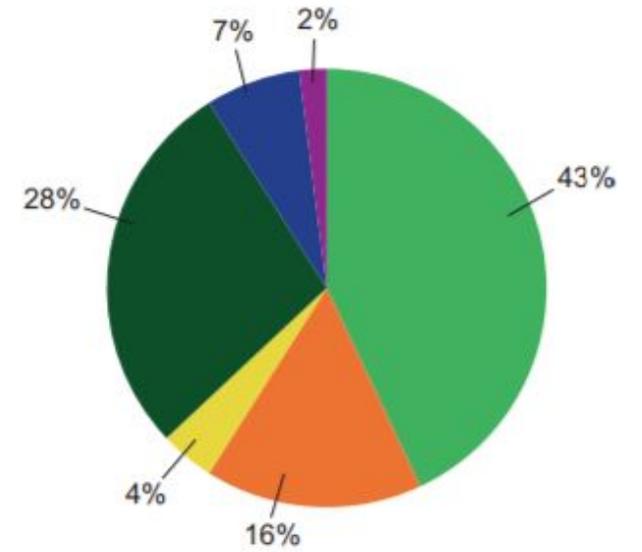
- ▶ [Interactive Map and Graphs](#)



# Why are there so many estimates of forest?

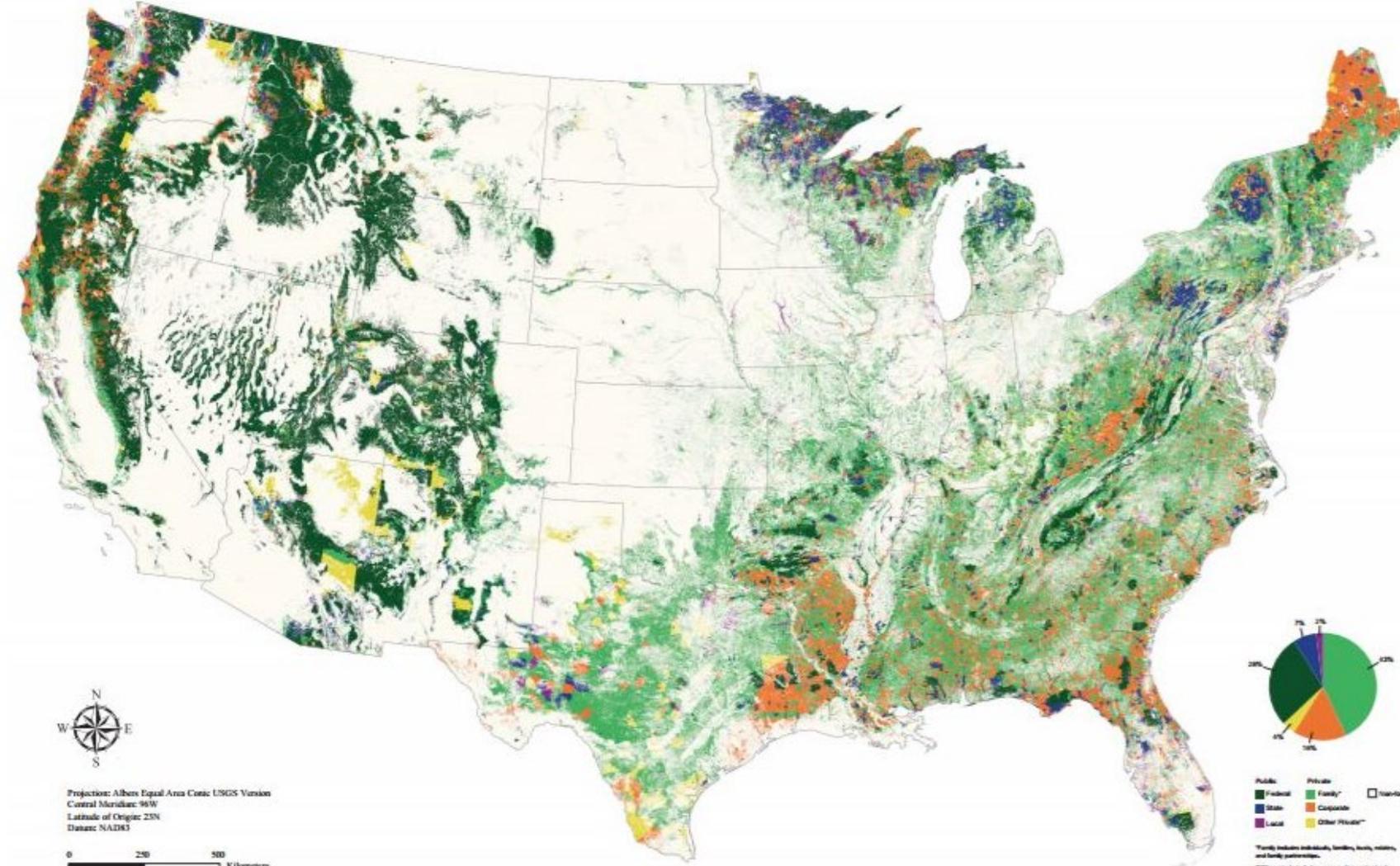
- ▶ Land cover or Land use – what is the difference, anyway?

# Who owns US Forests?

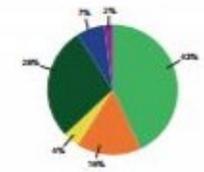
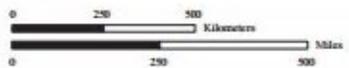


\*Family includes individuals, families, trusts, estates, and family partnerships.

\*\*Other private includes conservation and natural resource organizations, unincorporated partnerships and associations, and Native American tribal lands.

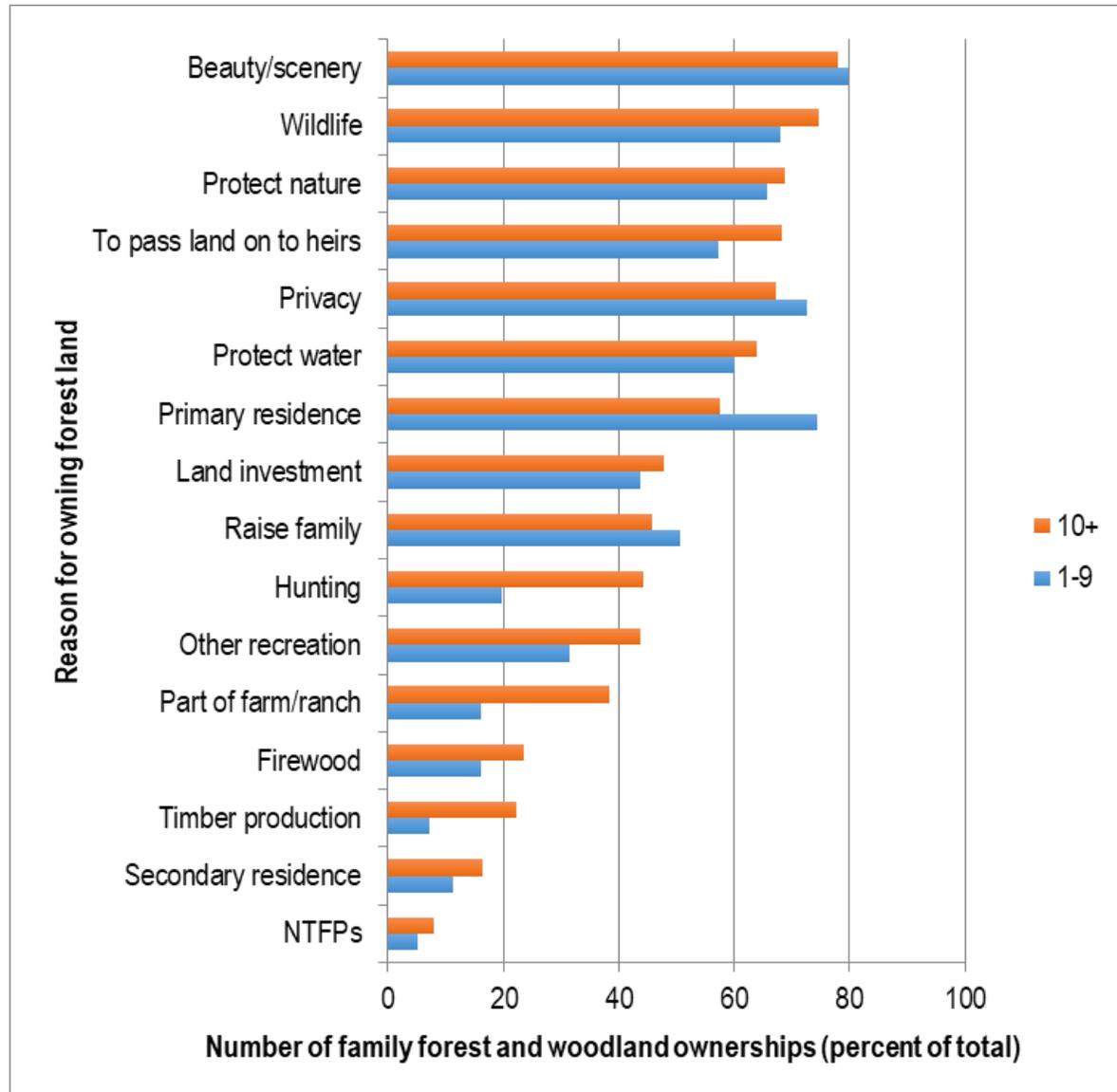


Projection: Albers Equal Area Conic USGS Version  
 Central Meridian: 96W  
 Latitude of Origin: 25N  
 Datum: NAD83

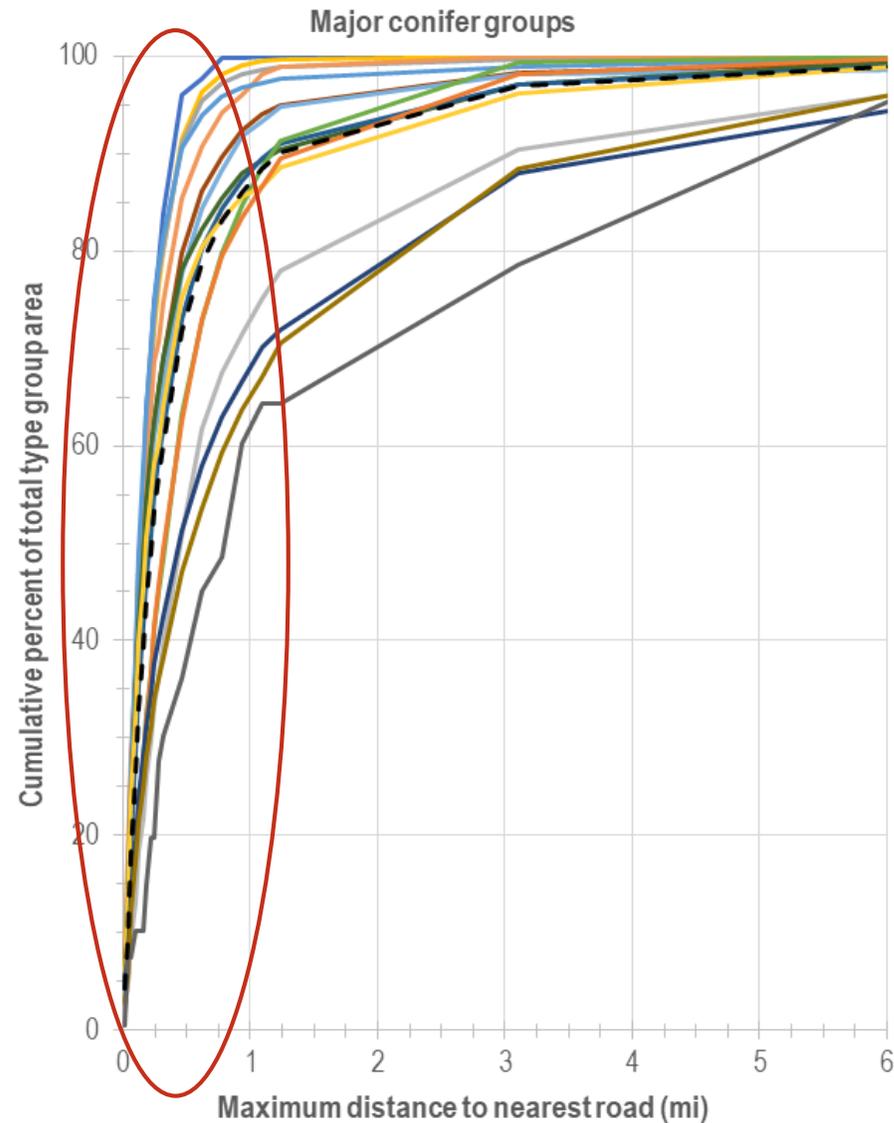
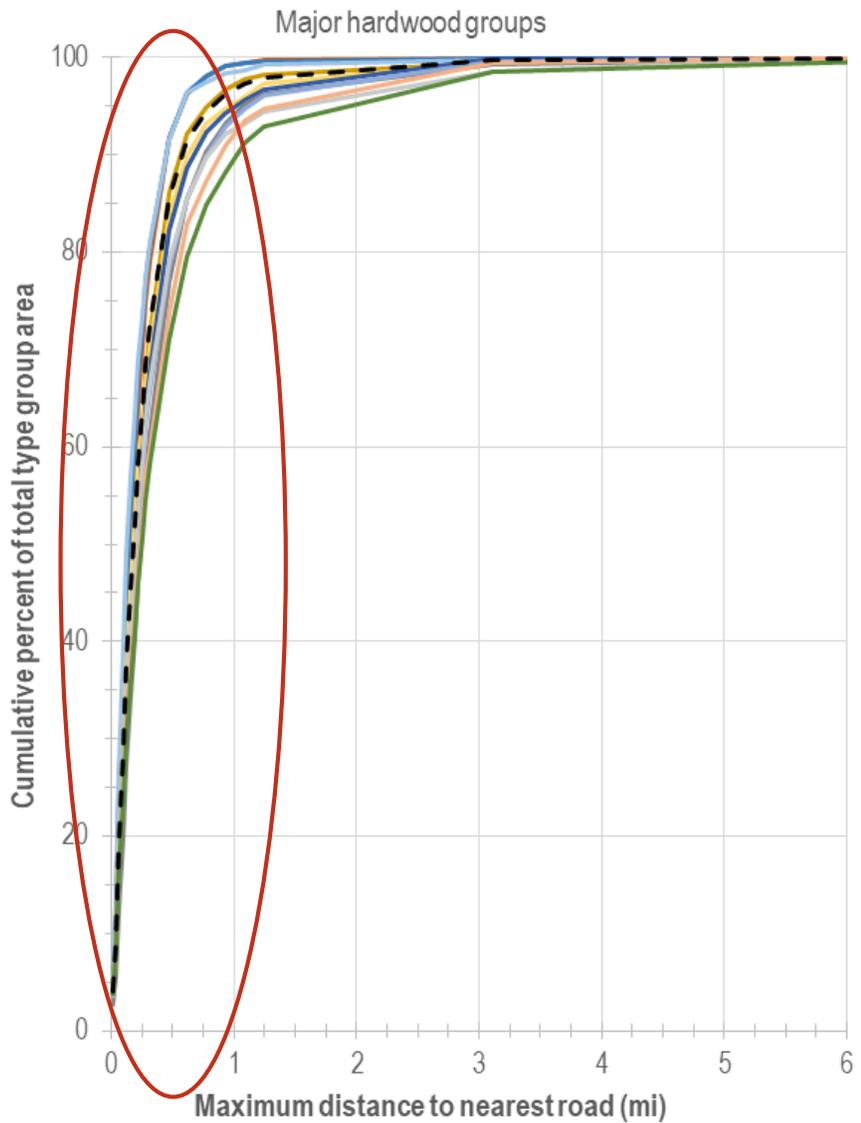


\*Family includes individuals, families, trusts, estates, and family partnerships.  
 \*\*Other private includes conservation and natural resource organizations, unincorporated partnerships and associations, and Native American tribal lands.

# What do owners of family forests value?

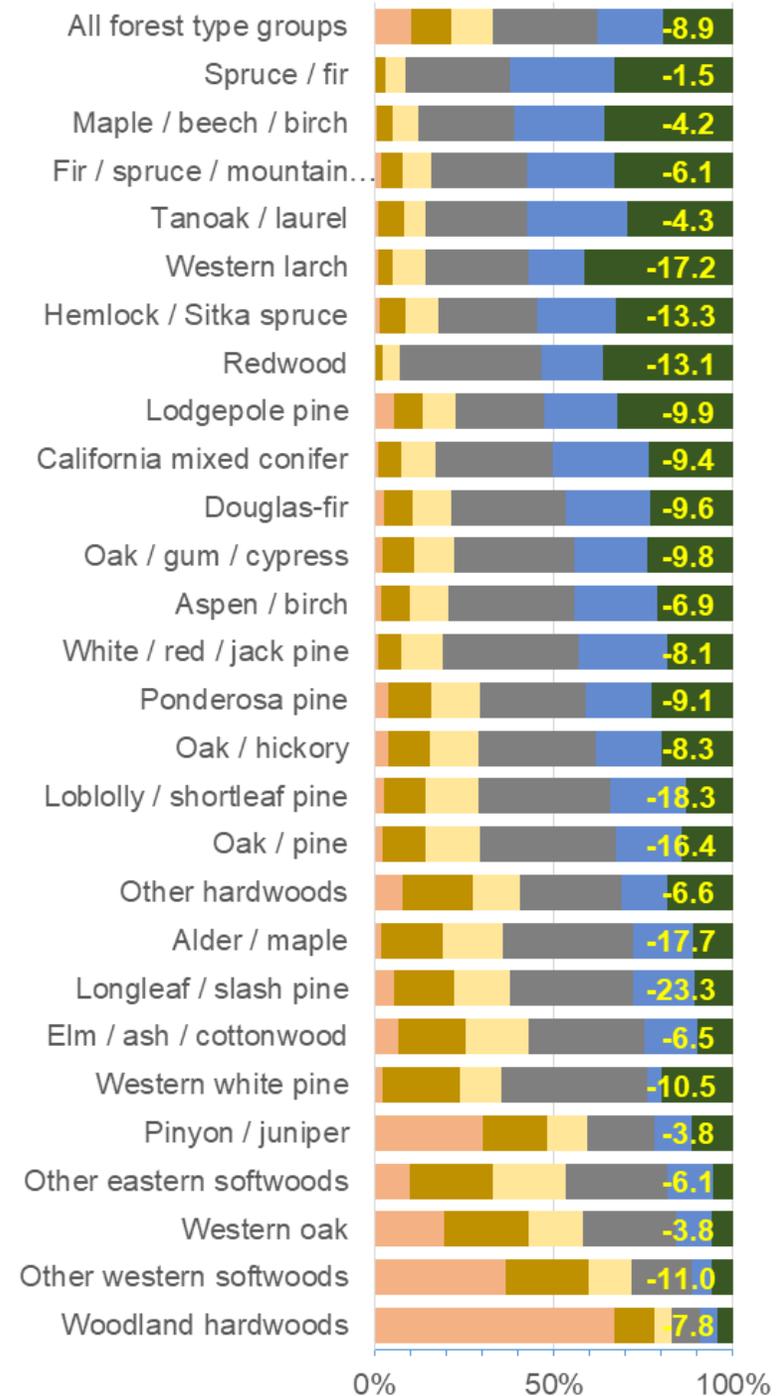
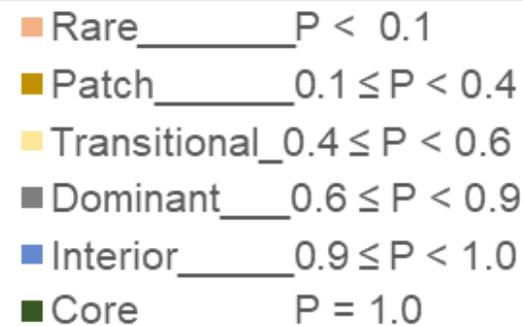


# How accessible are forests?



# Are forests fragmented?

- ▶ Between 2001 and 2011 forest area in interior and core categories decreased by 8.9 percent.
- ▶ The forest type with largest proportion of interior and core forest is spruce/fir, while woodland hardwoods have the least “core” forest, probably because they are sparse to begin with.



# How do trees in cities contribute?



Urban forests removed 882,000 tons of air pollution in 2010 - \$5.4 billion in health impacts



Urban forests sequester 37 million tons of carbon, annually – worth \$4.8 billion



Urban forests reduce annual residential energy use by \$5.4 billion



# What kinds of trees grow in our forest?



Red maple is the most abundant species in the United States @ 25 billion trees



Loblolly pine – 22 billion trees



Balsam fir – 16 billion trees



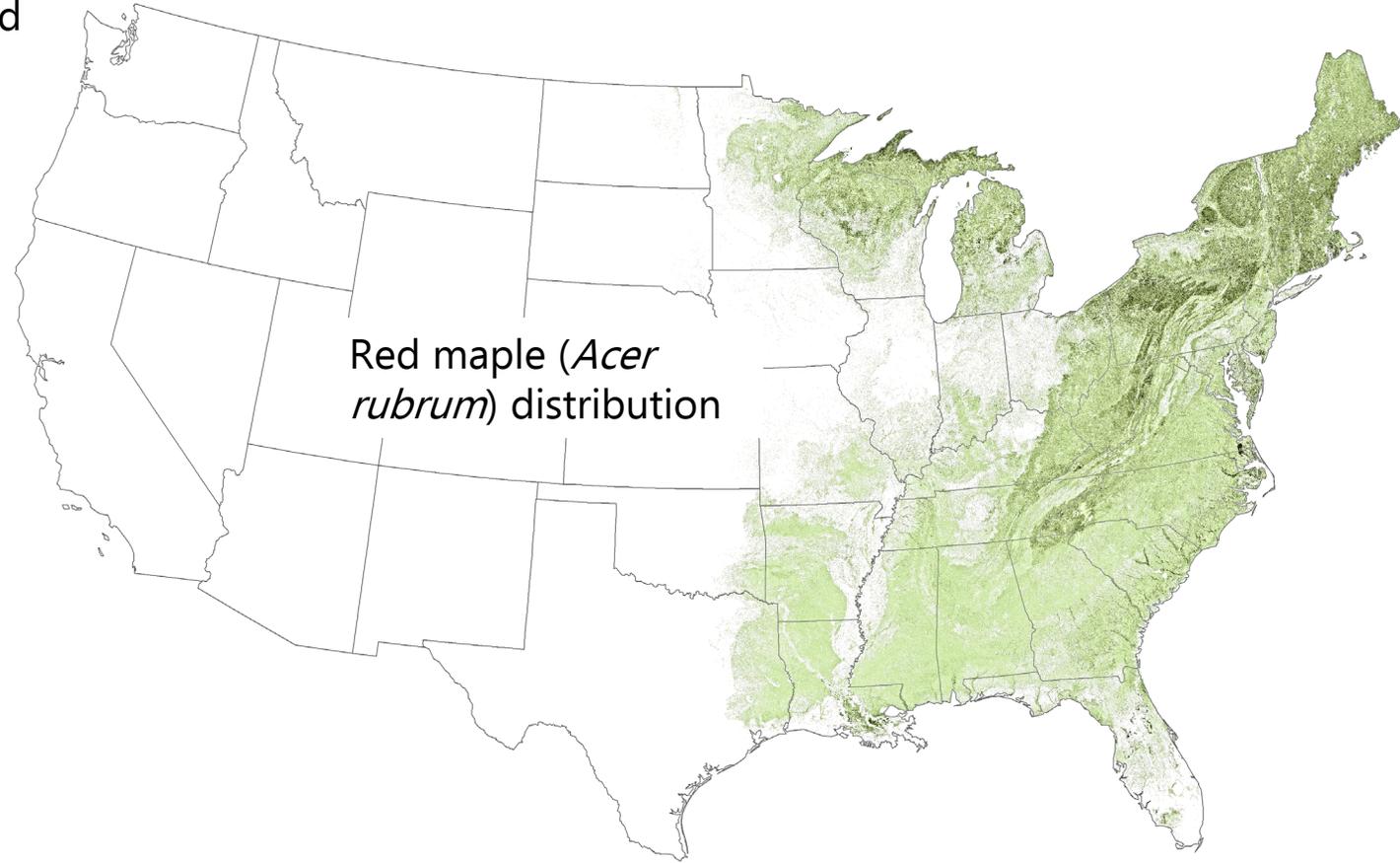
Sweetgum – 15 billion trees



Douglas-fir – 11 billion trees



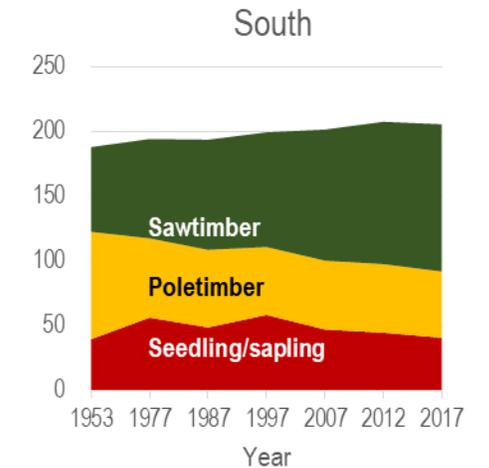
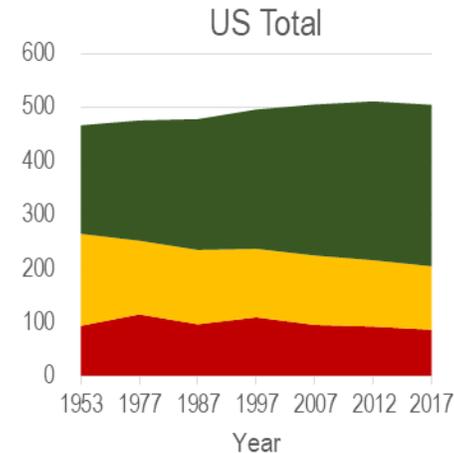
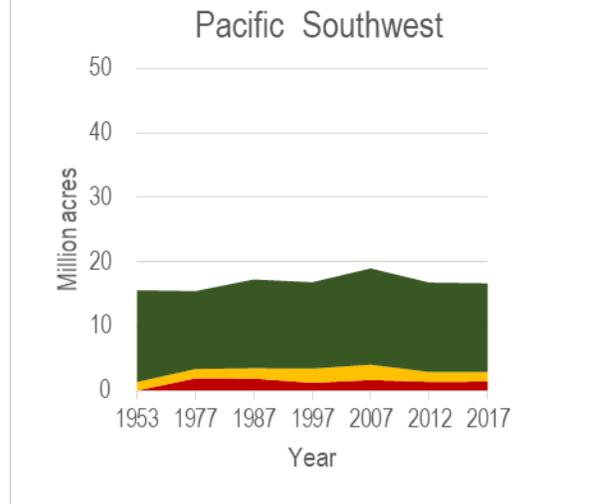
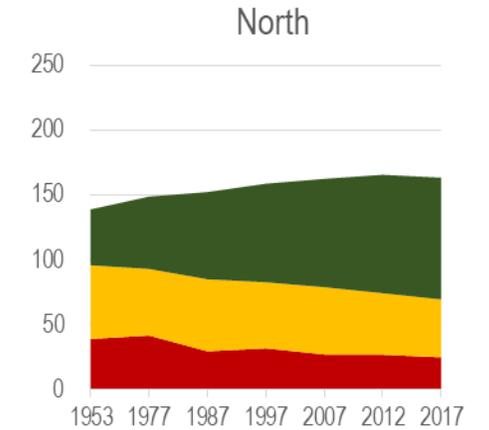
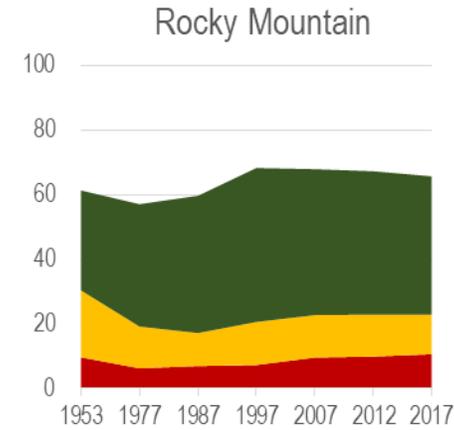
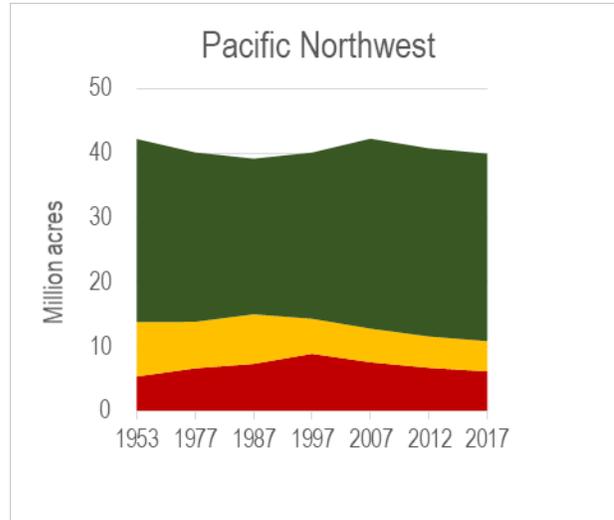
956 unique tree species were recorded in the continental States, Alaska, and Islands & Territories



# What size are our forests?

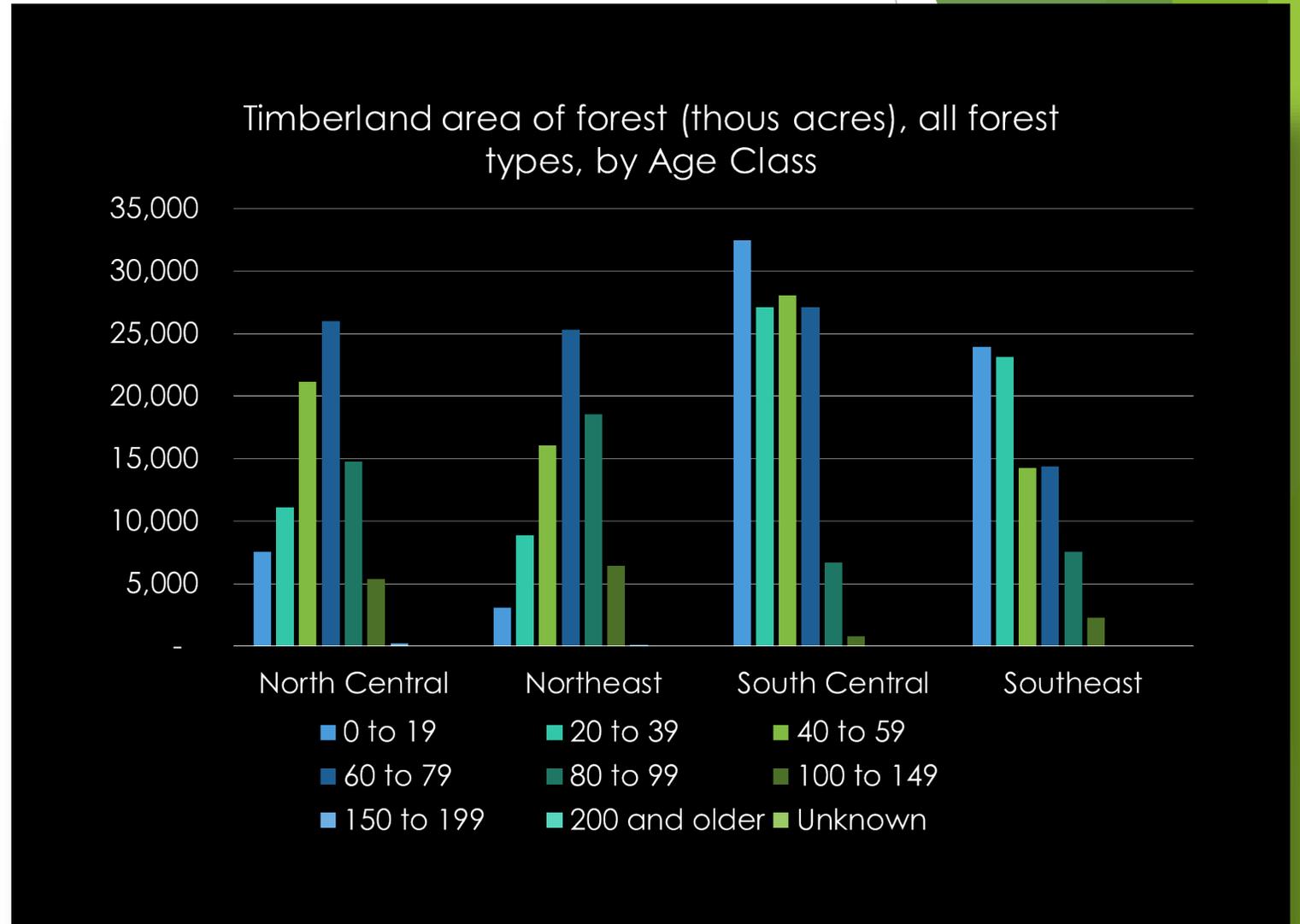
🌲 In general, forests in the US have been trending toward more acres in the larger "sawtimber" size class

🌲 This is particularly notable in the south and north



# What age are our forests?

Stands in the eastern north are trending toward older age cohorts



# How much wood is there?



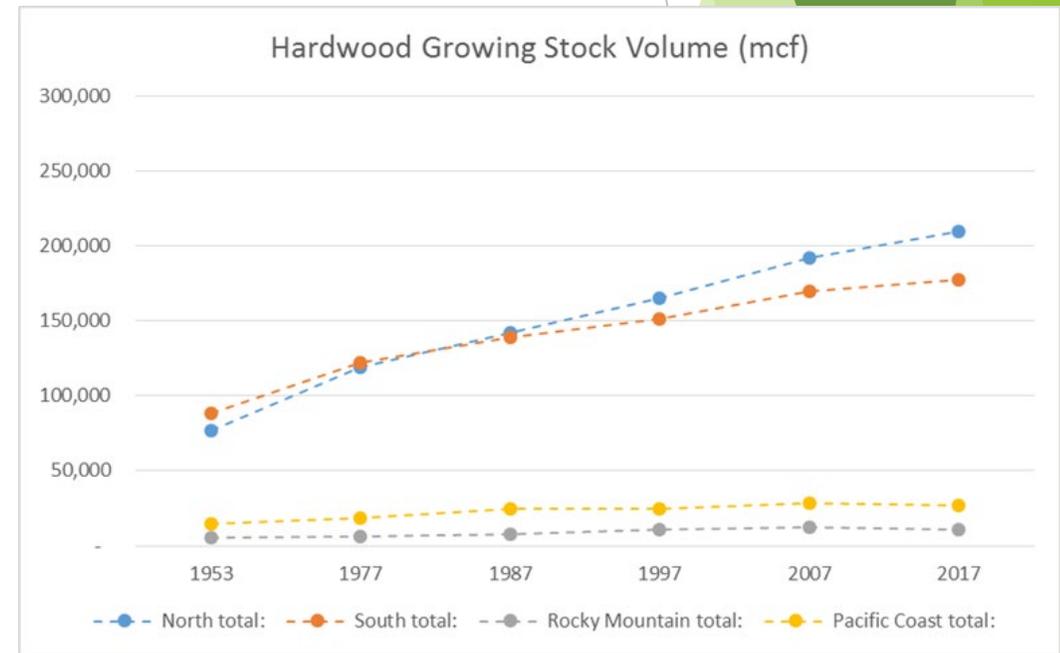
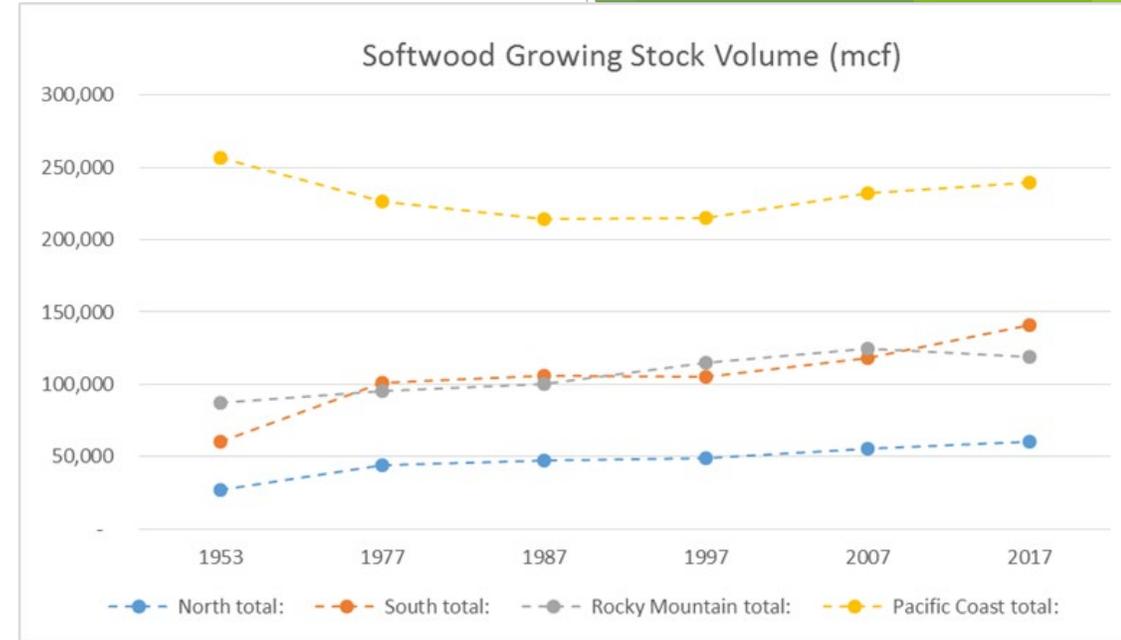
Total Live-tree volume = **1 trillion cubic feet**, or 9 billion stacked cords of wood.

 Softwoods = 54 percent

 Hardwoods = 46 percent



Hardwood volume continues to increase in the North and South, a reflection of decreased hardwood lumber production.



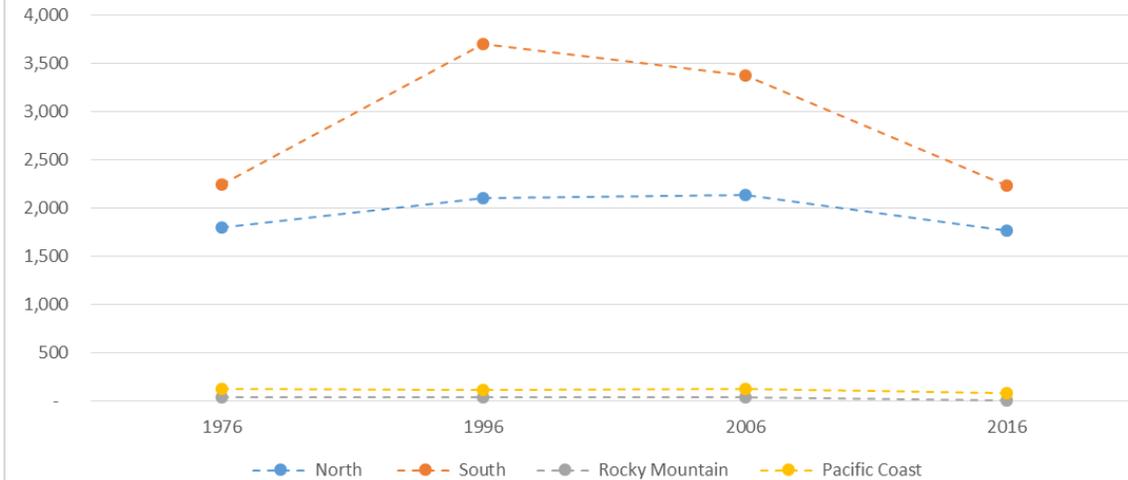
# How much wood do we grow compared to what we remove?



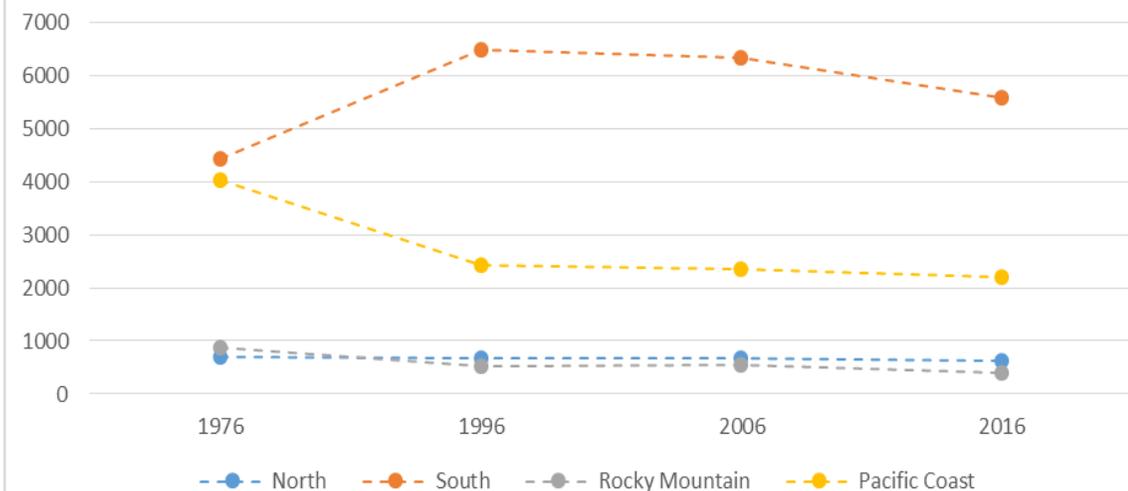
Nationwide, removals have decreased 17 percent since 2006.

From 1996 to 2016 removals in the South decreased by 23 percent, a reflection of the economic downturn, among other things.

Average annual hardwood removals by year and region (mcf)



Average annual softwood removals by year and region (mcf)



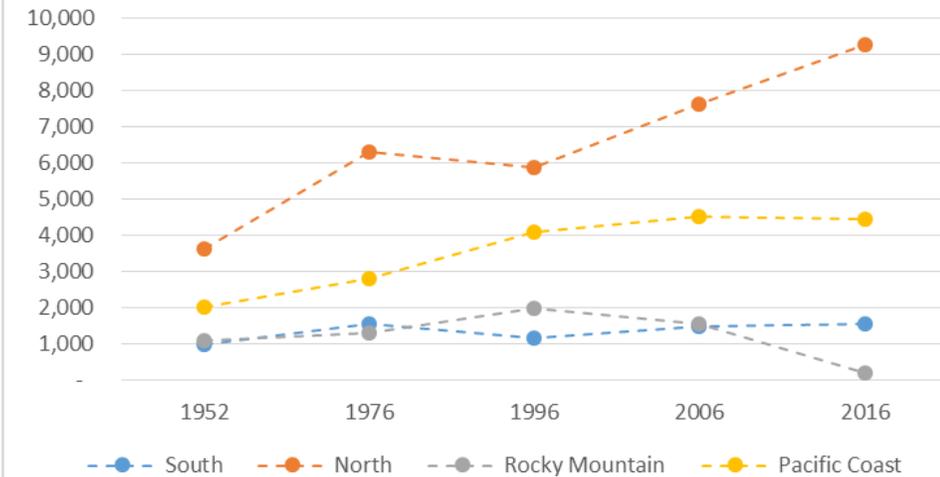
# How much wood do we grow compared to what we remove?

This is NET growth – already has mortality accounted for

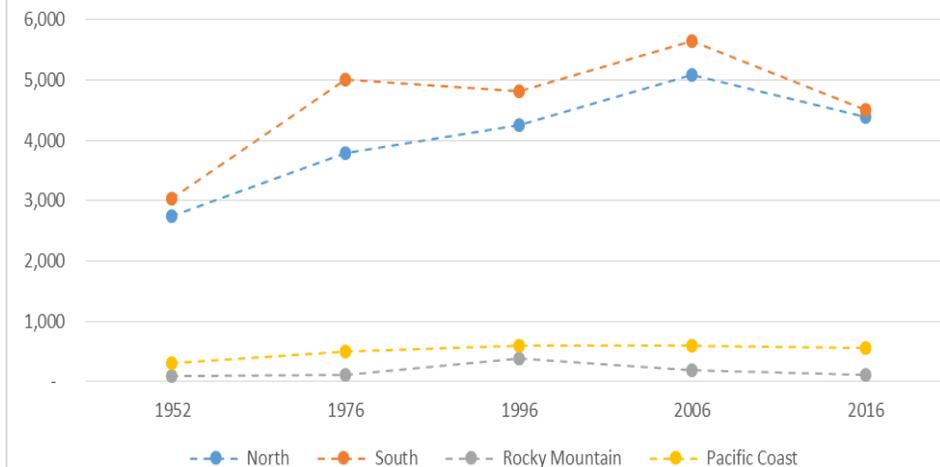
- Softwood growth has increased in the south
- Hardwood growth has declined in both the North and South
- In general, we grow twice what we remove, nationally.



Average annual softwood growth by region (mcf)



Average annual hardwood growth by year and region (mcf)



# There's an app for that...

- ▶ What are my state's forests like?

[https://public.tableau.com/shared/6Q7FW7YF8?:display\\_count=yes](https://public.tableau.com/shared/6Q7FW7YF8?:display_count=yes)

- ▶ What are the important commercial species in each Western state, and how they are used:

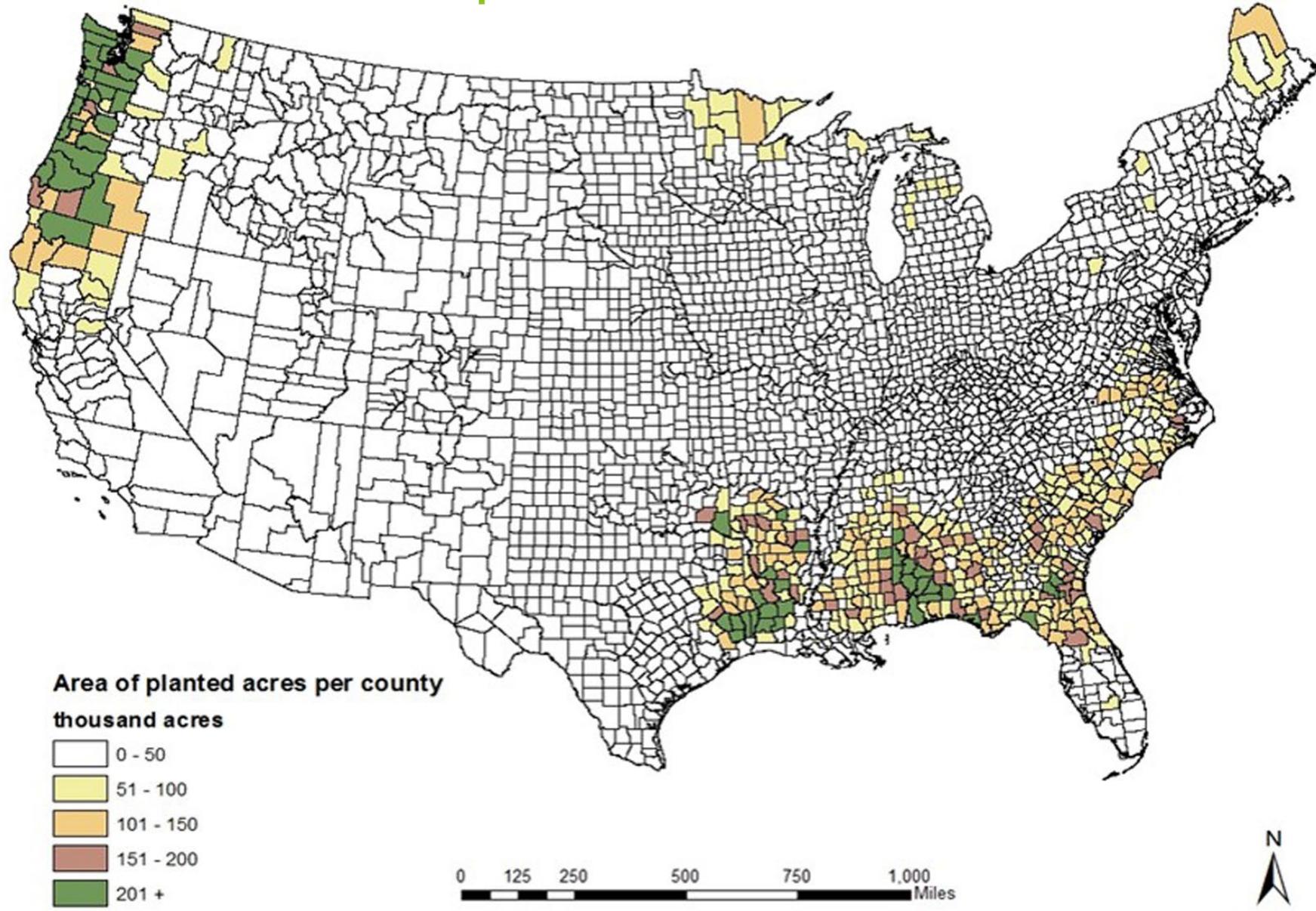
[https://public.tableau.com/shared/3SJG5CSDX?:display\\_count=yes](https://public.tableau.com/shared/3SJG5CSDX?:display_count=yes)

- ▶ Commercial species in Eastern states – COMING SOON!

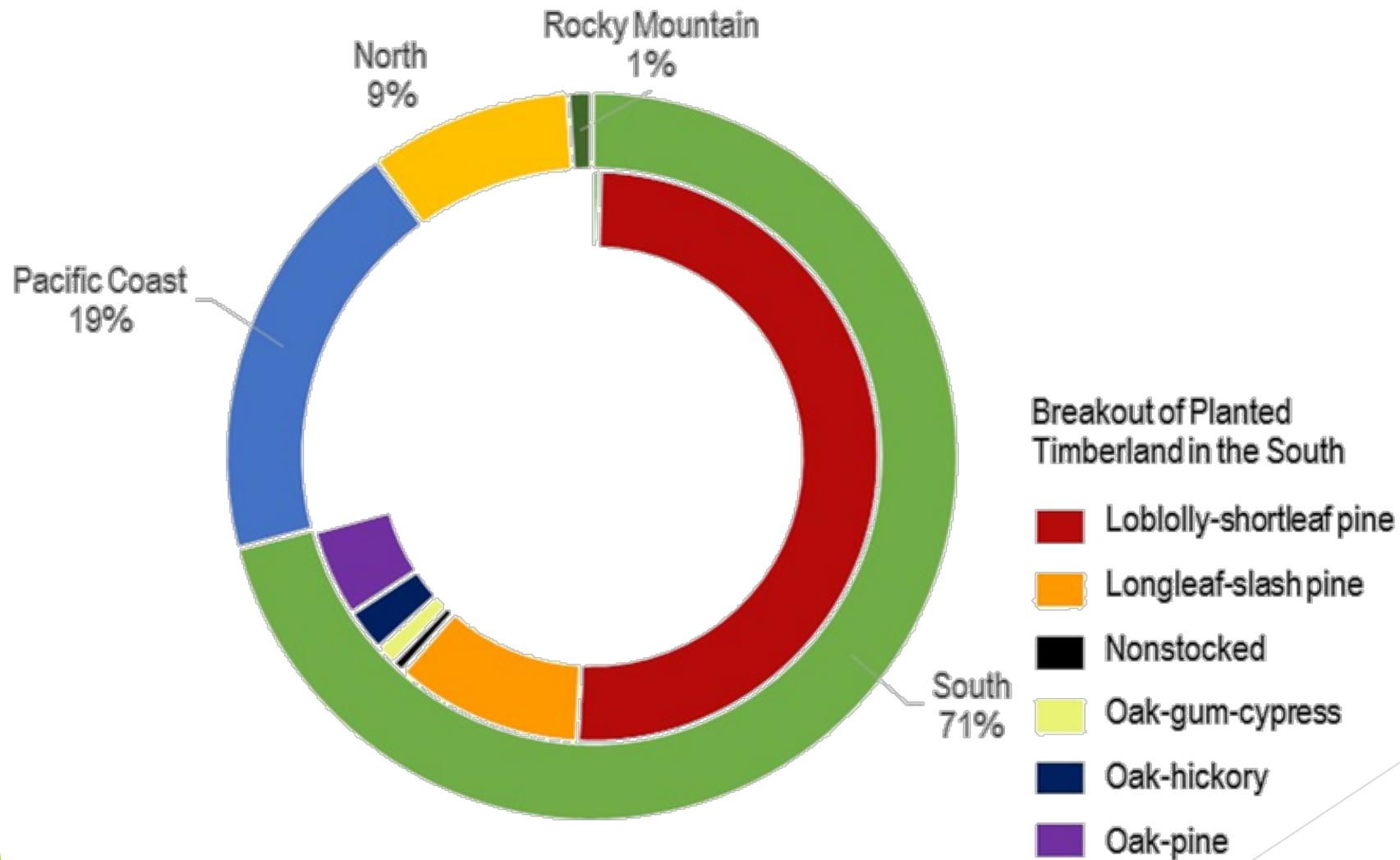
# How much timberland do we plant?

Eighty-seven percent of timberland is of natural origin.

**13%** is planted



# What kinds of timberland do we plant?

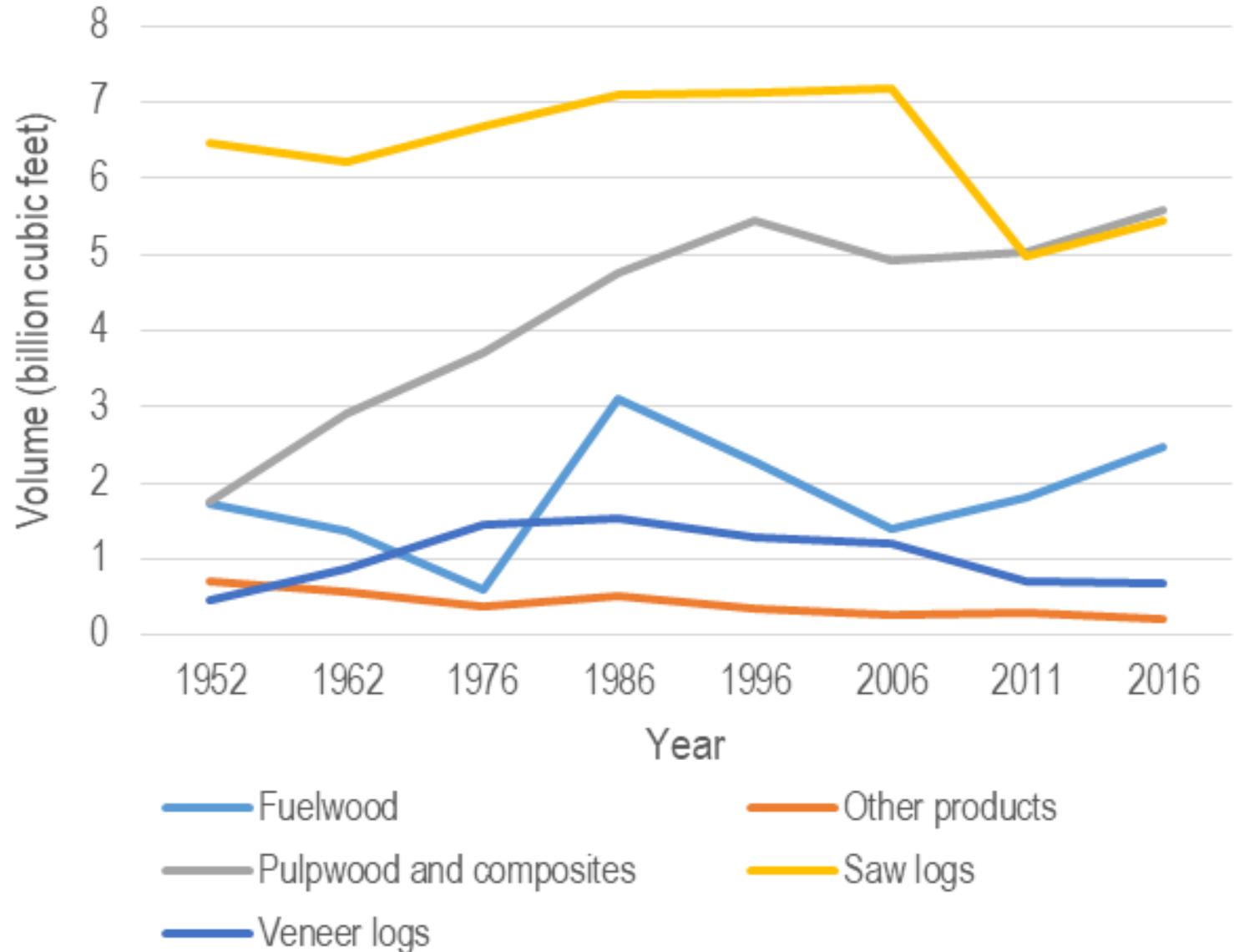


# There's an app for that...

- ▶ Do we replant what we harvest?  
This visualization is semi-complete. I've finished it, but I intend to improve on it. Currently it helps users understand growth and removals along with planting rates.
- ▶ [https://public.tableau.com/views/Dowereplantforeststhatweharvest/Dashboard1?embed=y&:display\\_count=yes](https://public.tableau.com/views/Dowereplantforeststhatweharvest/Dashboard1?embed=y&:display_count=yes)

# What do people do with trees they harvest?

- 🌲 2016 removals for industrial products and fuelwood were 14.4 billion cubic feet
- 🌲 Saw log production in 2016 was only 76 percent of 2006 output levels



# What other products come from forests?

🌲 Rough estimates of the contribution of nontimber forest products to the US economy yield wholesale values of **over \$1 billion** in 2010.

🌲 Nontimber forest products include medicinal plants, forest foods (mushrooms, maple syrup, blueberries, etc), Christmas trees and other arts, crafts, and florals, and fuelwood, among others.



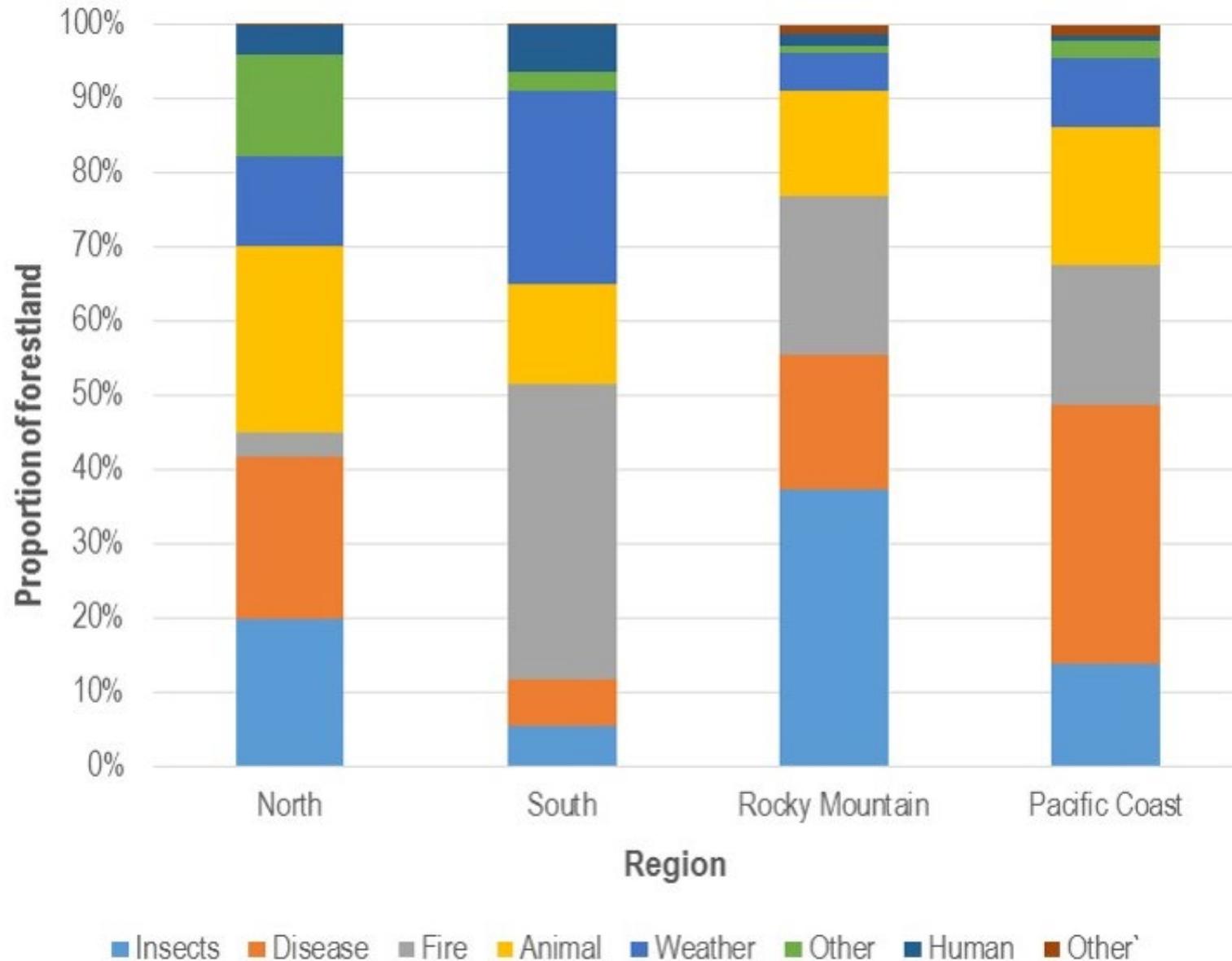
# What threatens the health of our forests?

 Wildfire

 Insects

 Disease

Interactions between all of the disturbances make it difficult to track initial causes of damage and mortality.



# Are invasive trees a problem?

- ▶ [https://public.tableau.com/shared/MMYGXBG4B?:display\\_count=yes&:origin=viz\\_share\\_link&:showVizHome=no](https://public.tableau.com/shared/MMYGXBG4B?:display_count=yes&:origin=viz_share_link&:showVizHome=no)

## Are nonnative invasive trees a problem on U.S. forest land?

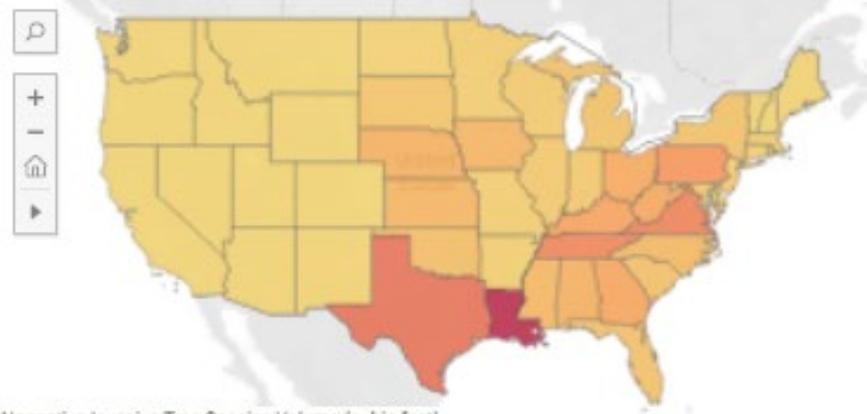


According to the Forest Resources of the United States, 2017, nonnative invasive plants continue to impact native forests and woodlands. Tallow-tree (*Triadica seberifera*) is now the most common nonnative invasive tree on United States forestland. Replacement of native trees with non native invasives can impact local economies, soil chemistry, wildlife habitat, and can replace unique landscape features. Read the Forest Resources of the United States, 2017:

<https://www.fia.fs.fed.us/program-features/rpa/>



Chinaberry Norway maple Pinacastree Puntree Russian olive Salcedar Siberian elm Siltree Tallow tree Tree-of-heaven White mulberry



Nonnative Invasive Tree Species Volume (cubic feet)  
71,287 260,630,979

### How to use this dashboard:

To see the distribution of a species on forested FIA plots - click on the tree icons

To see the total volume of a particular invasive tree in a state - click on the tree icon

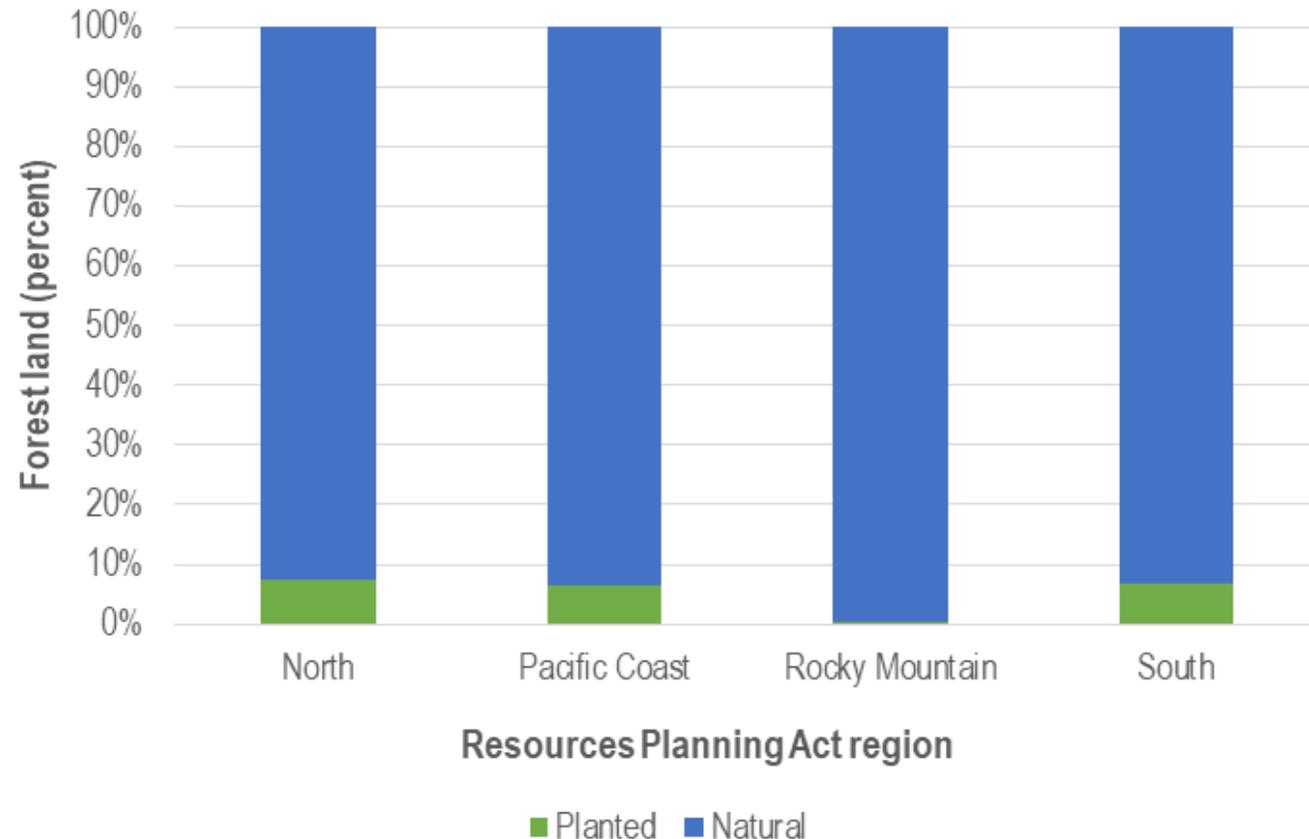
To see the total volume of all invasive trees in a state: click on the state

To clear all filters: Press the escape key on your keyboard

Data Source: Oswalt, S.N.; Smith, W.B.; Miles, P.D.; Pugh, S.A. (Coords.). 2019. Forest resources of the United States, 2017: a technical document supporting the 2020 RPA Assessment.

# What can Forest Inventory say about our National Forest System?

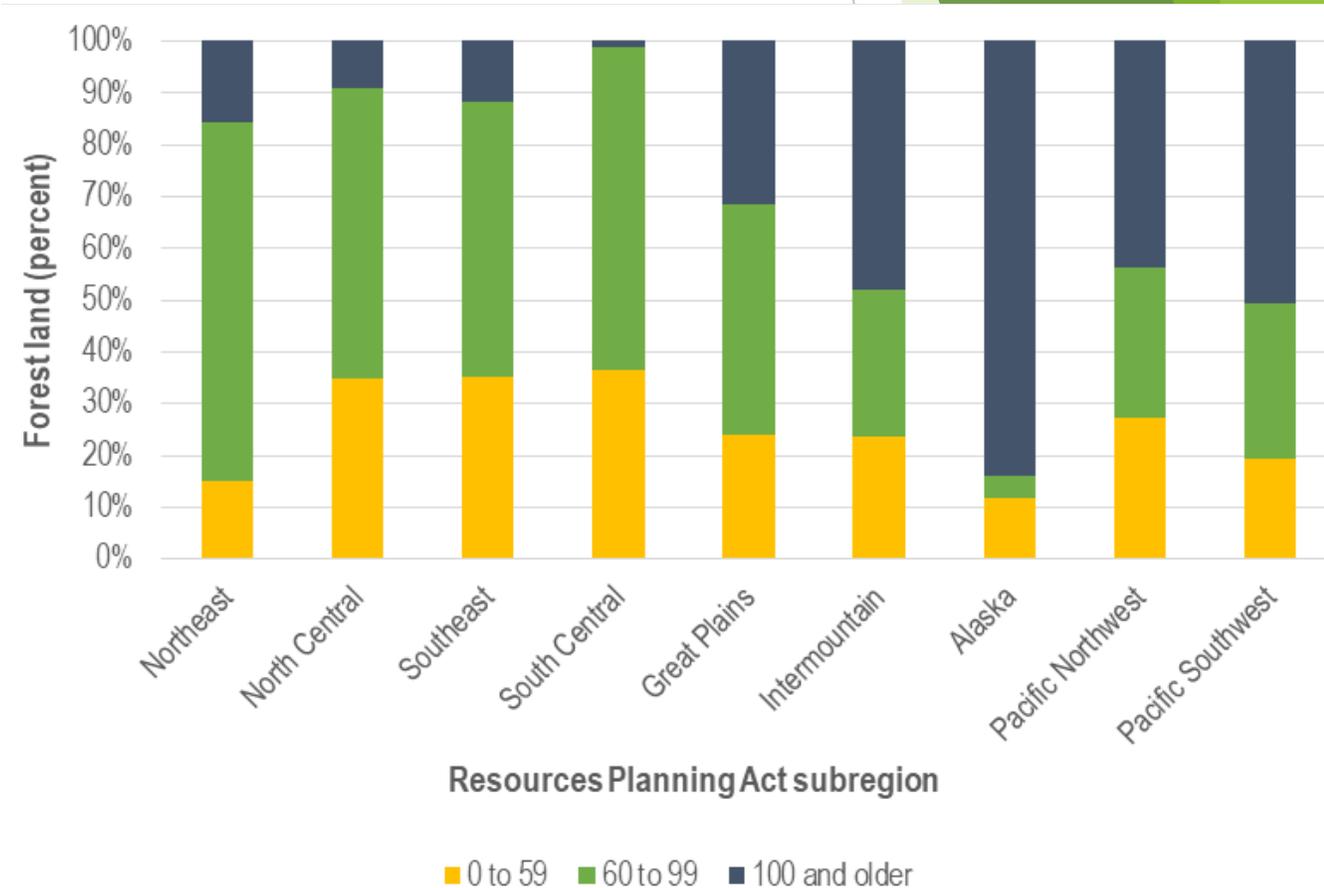
- 🌲 The National Forest System covers 193 million acres, 145 million acres of which is forest
- 🌲 The western US is home to the majority of our National Forest System land
- 🌲 The Rocky Mountain Region contains 50 percent of all NFS forest land, alone.
- 🌲 Only 4 percent of NFS forest land is planted



# What can Forest Inventory say about our National Forest System?

🌲 Compared to the remainder of US forests, National Forest System forest land trends toward older, more mature forests.

🌲 In general, tree growth on National Forest System land in the Rocky Mountains has declined over the last 20 years, mostly as a result of mortality from the Mountain Pine Beetle, combined with wildfire and drought.



# What else is in the report?

 Islands, Territories, Alaska, Special topics

 Downloadable tables available at: <https://www.fia.fs.fed.us/program-features/rpa/index.php>

 Interactive visualizations available at:  
<https://public.tableau.com/profile/sonja.n.oswalt#!/>

 Additional forest inventory digital products available at:  
<https://usfs.maps.arcgis.com/apps/PublicGallery/index.html?appid=e67afb7be2c8443ca64a2e8a8e473532>