



**Historical Presence of
Riparian Forests in South
Dakota and Nebraska**

**W. Carter Johnson
Dept. of Horticulture, Forestry,
Landscape, and Parks
South Dakota State University**

Trees on the Prairie

- Why not?
 - Moisture (p/e ratio)
 - Competition with grasses
 - Fire
 - Grazing
- Why?
 - Presence of shallow groundwater
 - Geomorphic action of streams removes competing vegetation
 - Irrigation effect from overbank flooding
 - Concentrated runoff in draws

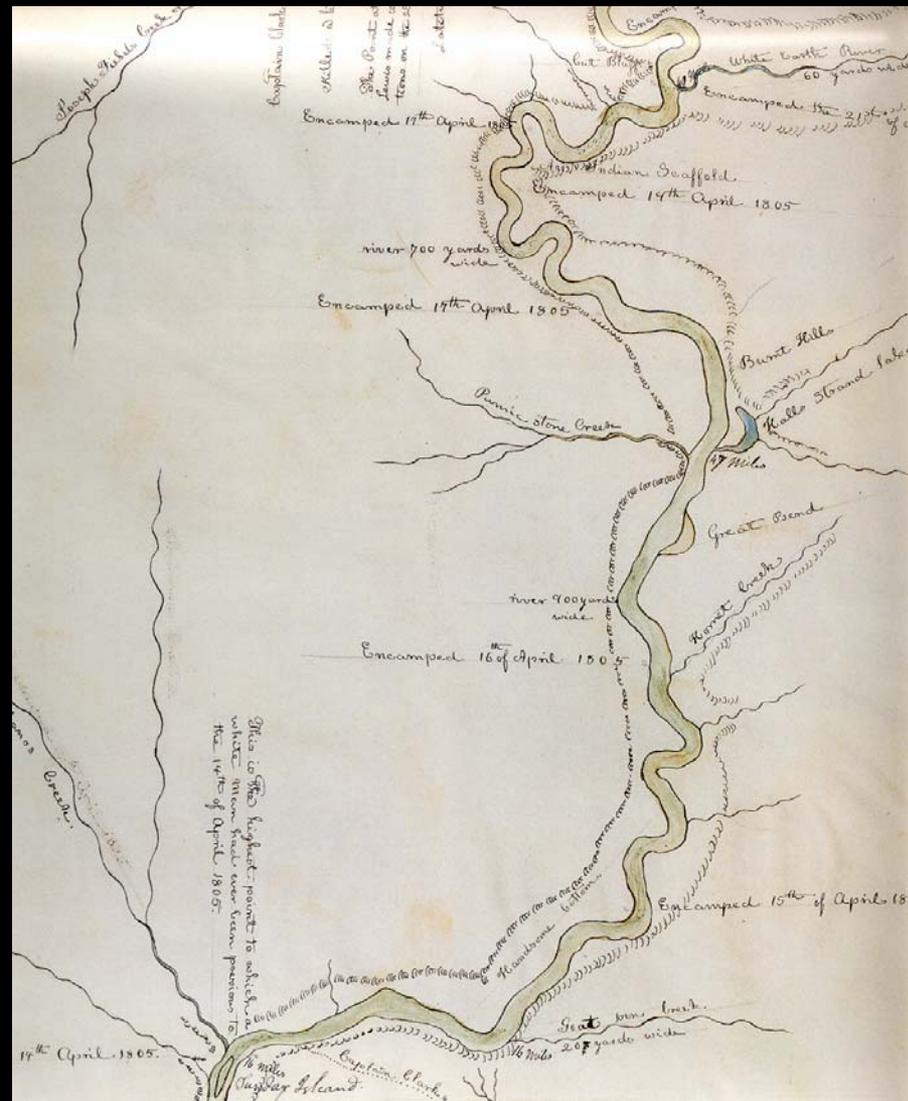
Trees on the Prairie

- Where?
 - Perennial rivers (e.g., Missouri, White, Big Sioux)
 - Intermittent streams
 - Lake shores (e.g., Oakwood, Whitewood)
 - Uplands (woody draws, oak hilltops)
- What kind?
 - Sources of Information
 - Diaries/Journals from soldiers, settlers, explorers
 - Early photographs
 - Pollen/Macrofossils found in lake sediments
 - General Land Office survey notes and maps
 - Deciduous/Coniferous
 - East to west gradient

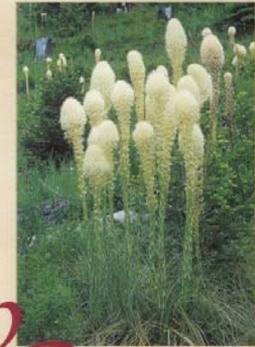
Pre-settlement Forests: Sources of Information

- Diaries/Journals from soldiers, settlers, explorers
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Exploration



PLANTS of the Lewis & Clark EXPEDITION



H. WAYNE PHILLIPS

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Native American Use of Wood

“In the summer the Dakotas follow the buffaloes in their range over the prairie, and in the winter fix their lodges in the ... fringes of wood along the banks of the lakes and streams. The bark of the cottonwood furnishes food for their horses

Use of Wood (ctd.)

during the winter snows, and to obtain it many streams have been thinned or entirely stripped of their former beautiful groves.”

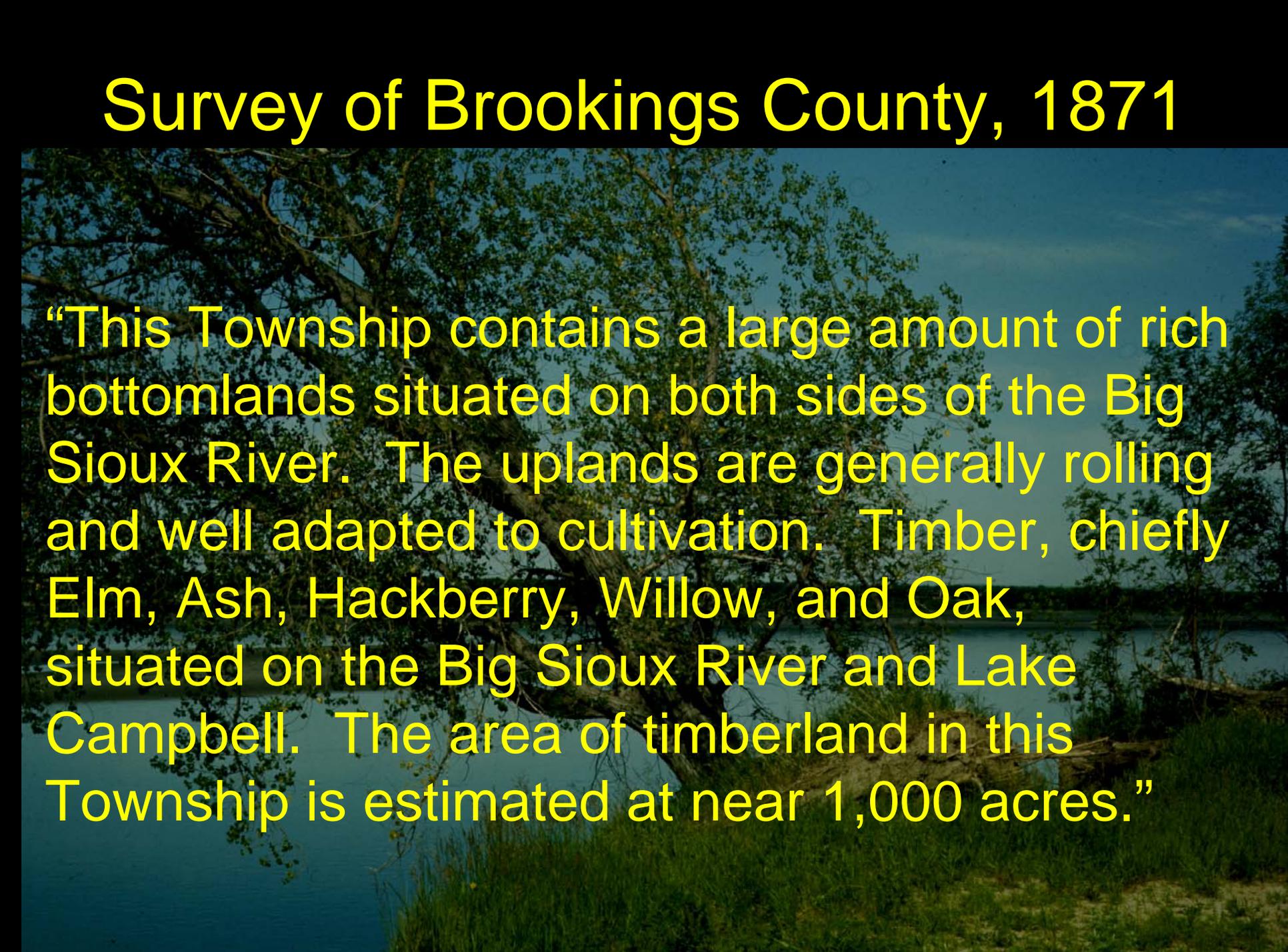
(Warren Expedition, 1855-1857)

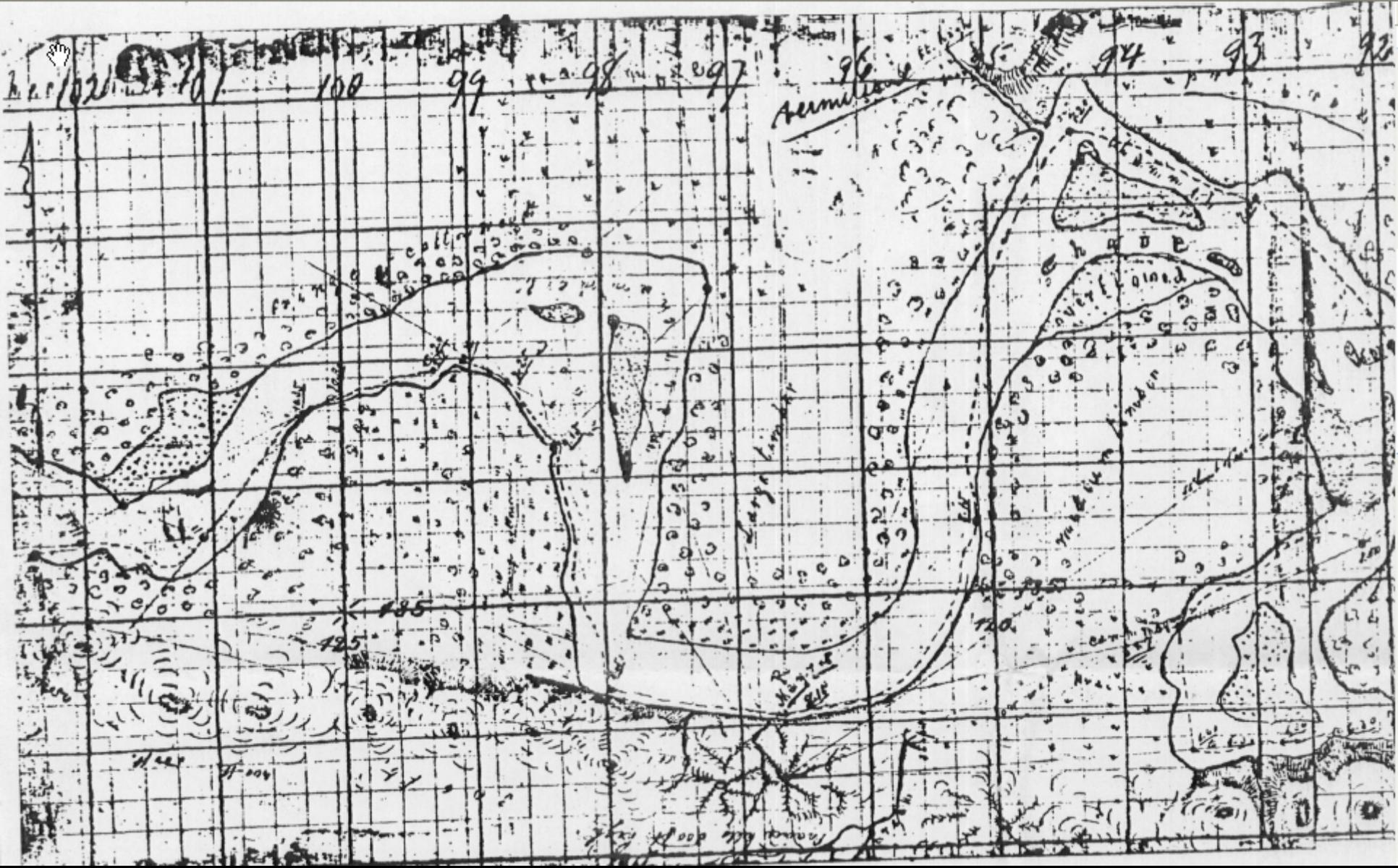
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Survey of Brookings County, 1871

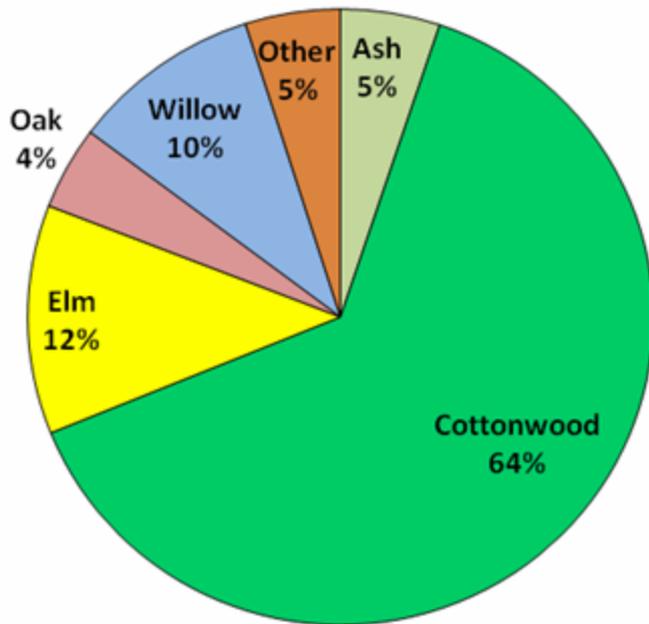
“This Township contains a large amount of rich bottomlands situated on both sides of the Big Sioux River. The uplands are generally rolling and well adapted to cultivation. Timber, chiefly Elm, Ash, Hackberry, Willow, and Oak, situated on the Big Sioux River and Lake Campbell. The area of timberland in this Township is estimated at near 1,000 acres.”

A scenic view of a riverbank with a large tree in the foreground and a body of water in the background. The tree is a large, mature deciduous tree with dense green foliage, partially obscuring the view of the river. The river is a wide, calm body of water, likely the Big Sioux River mentioned in the text. In the distance, there are more trees and a clear blue sky. The overall scene is peaceful and natural.

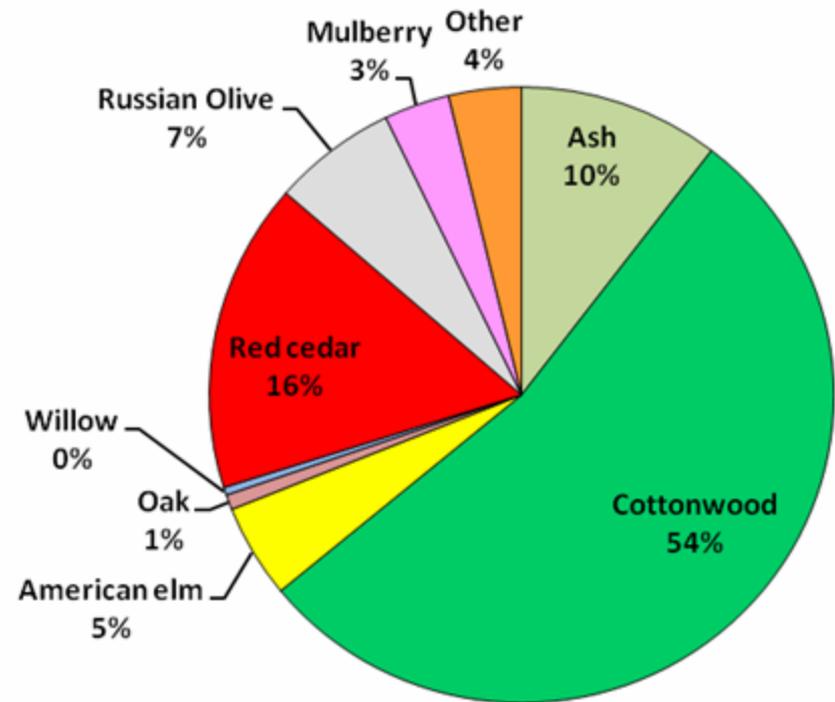


Tree Species Composition (Relative Density)

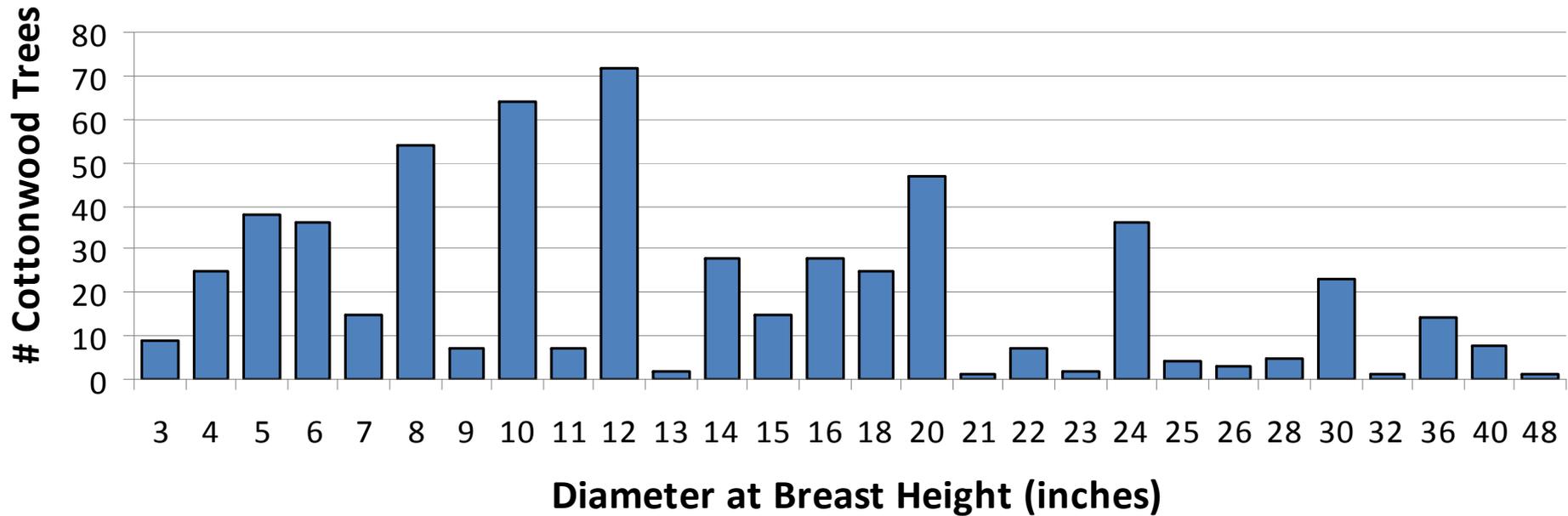
1857-1869
(GLO Survey)



2007
(field sampling)

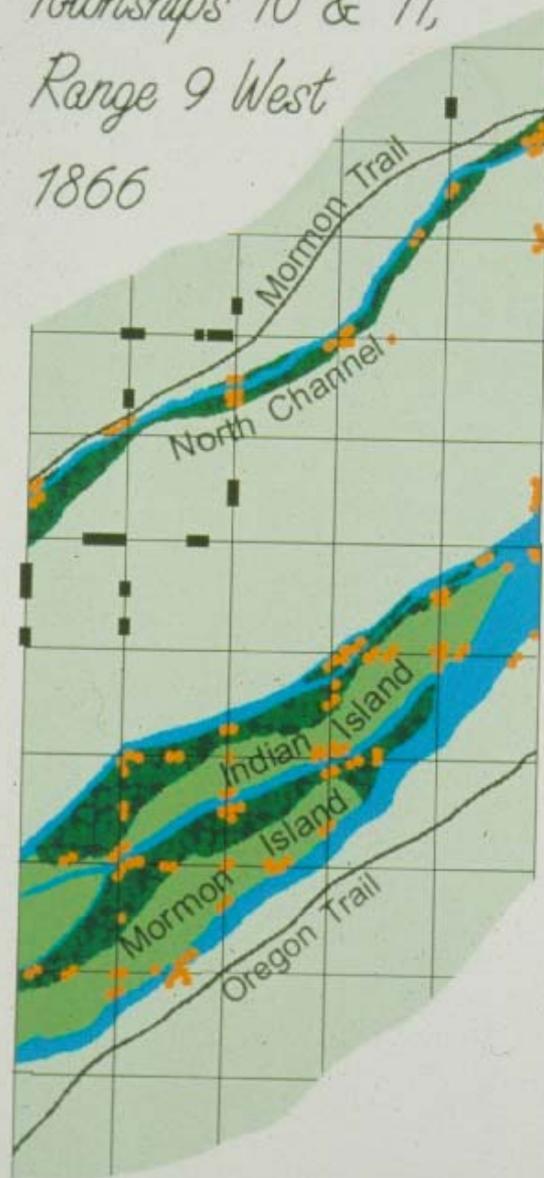


Size Distribution of Cottonwoods in GLO Notes (1858-61) for Segment 10



Platte River

Townships 10 & 11,
Range 9 West
1866

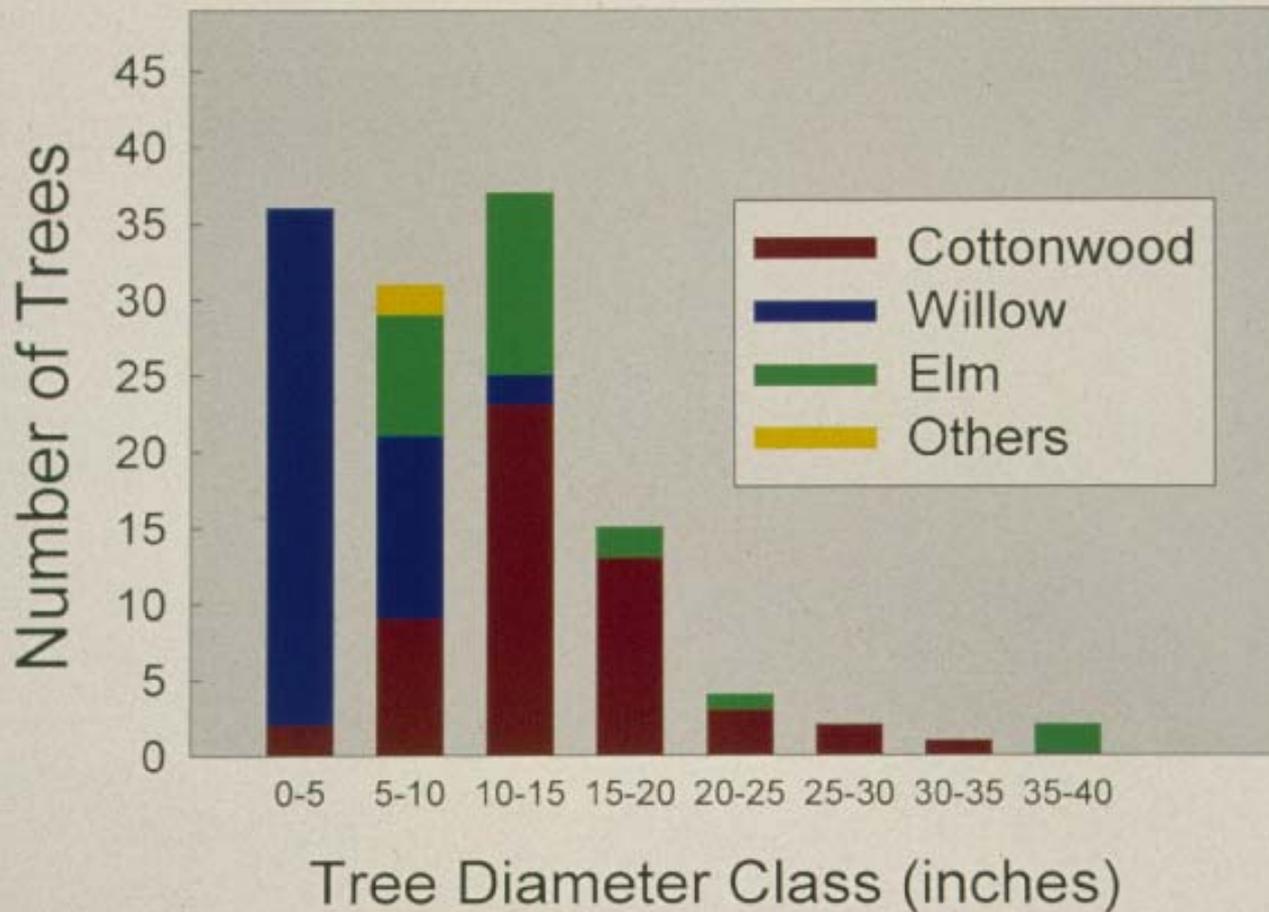


1 sq. mile
N

- Surveyed timber
- Lightly wooded
- Plowed fields
- Witness trees

Platte River

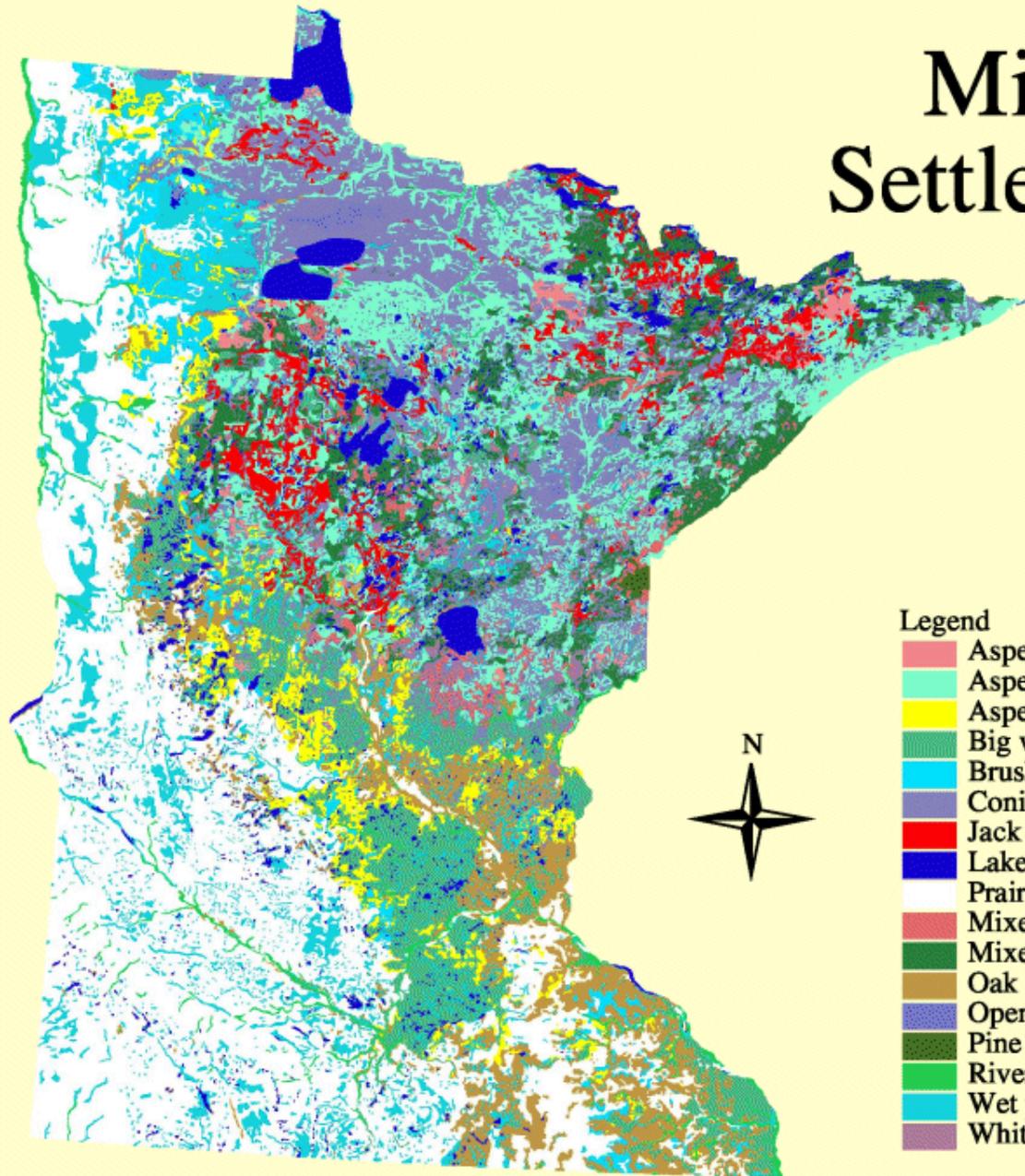
Witness Trees Measured by Surveyors



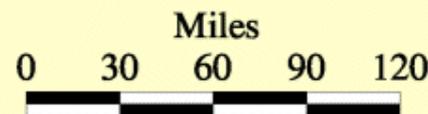
**“Banks of islands low, skirted
with cottonwood timber. The
whole island has been well
timbered with cottonwood and
ash but has been cut off.”**

--Range 21 near Lexington, Nebraska, 1868

Minnesota Early Settlement Vegetation



Scale
1:4000000



Legend

- Aspen-birch (eventually succeed to hardwoods)
- Aspen-birch (eventually succeed to conifers)
- Aspen-oak land
- Big woods - oaks, elm, basswood, ash, maple, etc.
- Brush prairie
- Conifer and bog swamps
- Jack pine barrens
- Lakes
- Prairie
- Mixed hardwood and pine
- Mixed white pine and Norway pine
- Oak opening and barrens
- Open muskeg
- Pine flats (hemlock, spruce, fir, cedar, & white pine)
- River bottom forest
- Wet prairie
- White pine

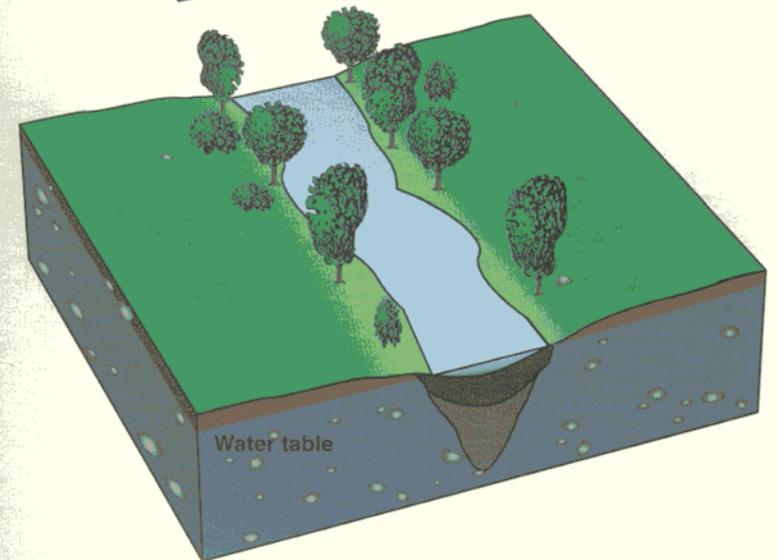
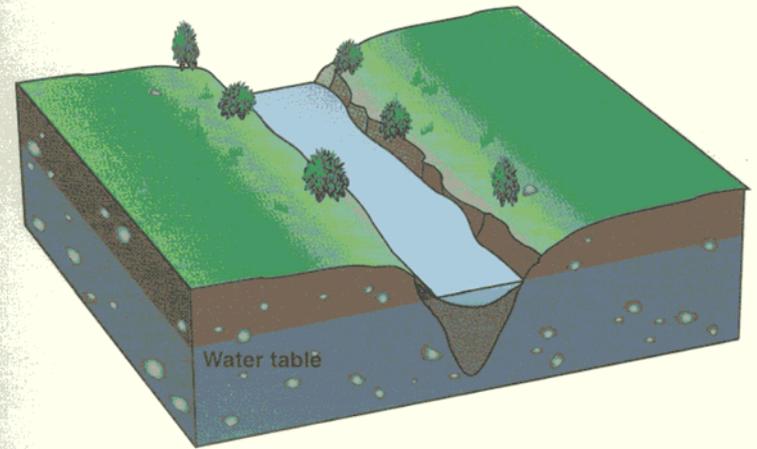
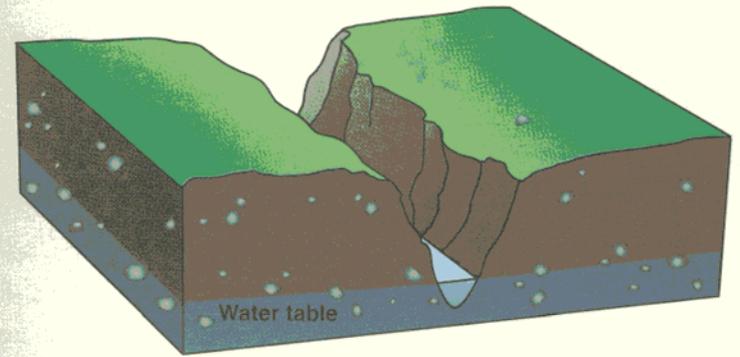


Vegetative cover map was derived from notes and maps from General Land Office surveys conducted in Minnesota (1847-1907). Map was digitized by the Minnesota DNR



“The creeks could be crossed with team and buggy at a trot, and they were tree-lined. Water holes that never went dry existed about every mile along the creek, and the grass was belly-deep on a team of horses.”

--as told to Clarence Mortenson by Louis Young, 1942



Conclusions

- SD is a prairie state but with highly valuable, naturally-occurring woodlands/forests
- Riparian forests associated with areas of higher moisture than afforded by the general climate
- Upland forests associated with rugged topography of major river valleys
- General Land Office survey records best single source of information on pre-settlement forests in specific locations

Conclusions

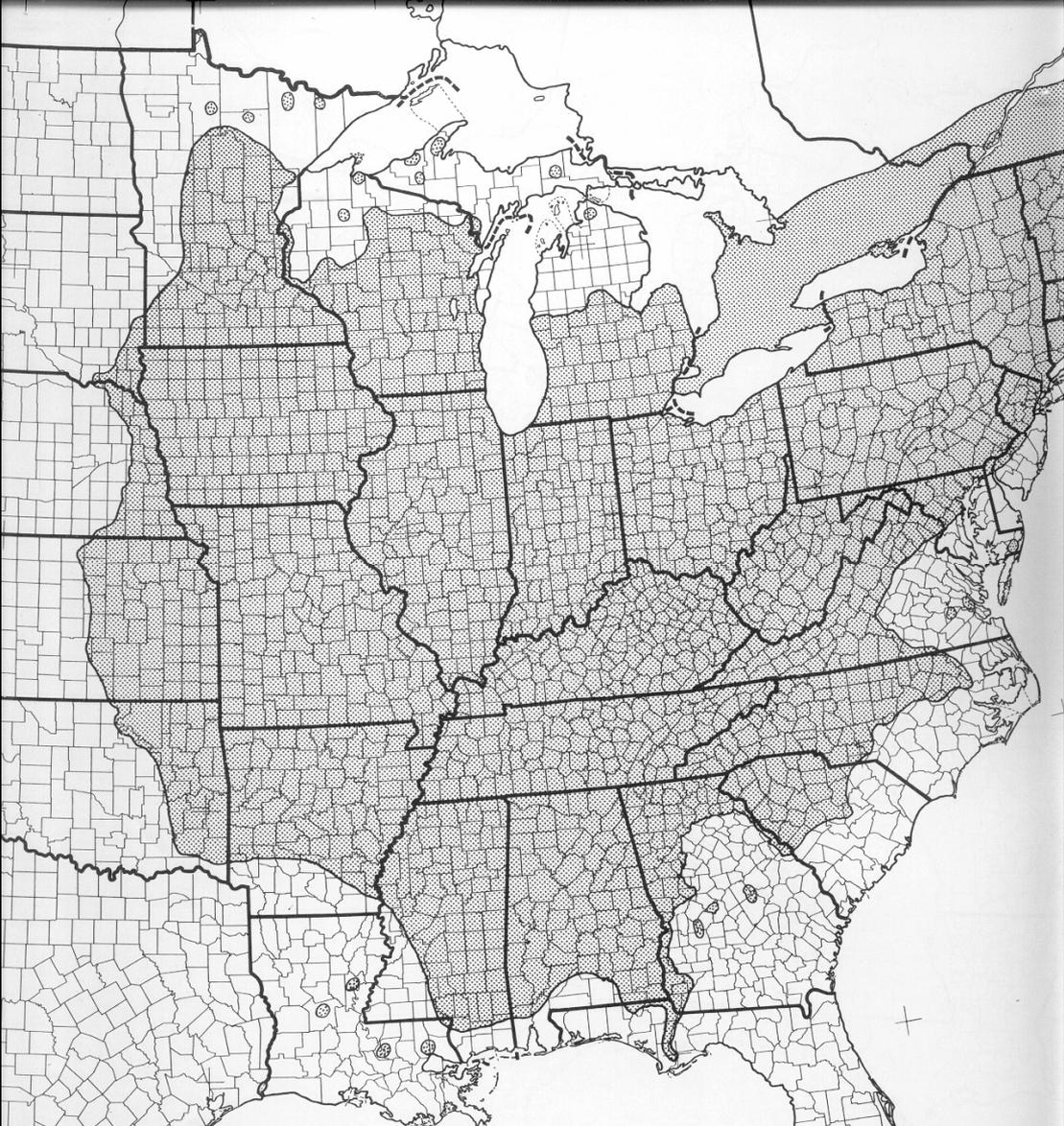
- Riparian woodland development directly related to river/stream size and flow volume/variability
- Riparian forests most extensive along large, perennial rivers
- Riparian forests along small, perennial rivers/streams mostly of the gallery forest type
- Riparian forests missing or scattered along intermittent streams
- Other forest patches and lone trees sprinkled in locally favorable sites on lake shores and shallow groundwater locations



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Geographic Range of Silver Maple



Trees on the Prairie

- Importance
 - Biodiversity
 - Wildlife
 - Environmental benefits