

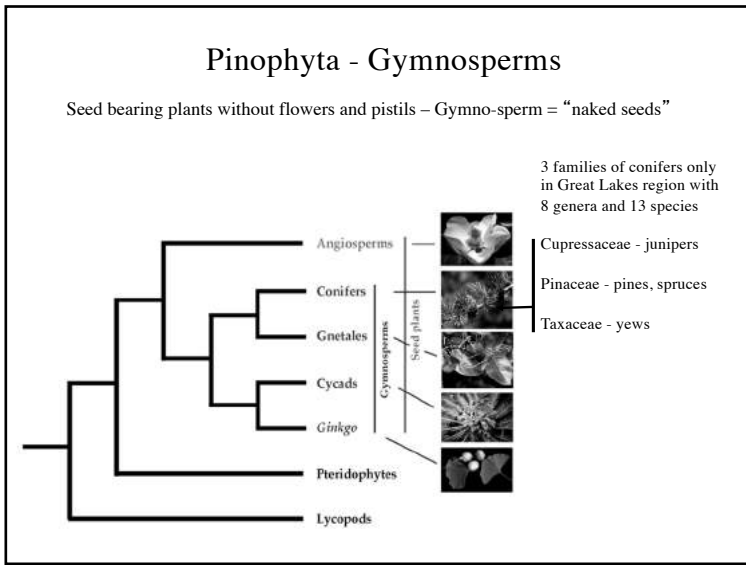
1

Pinophyta - Gymnosperms

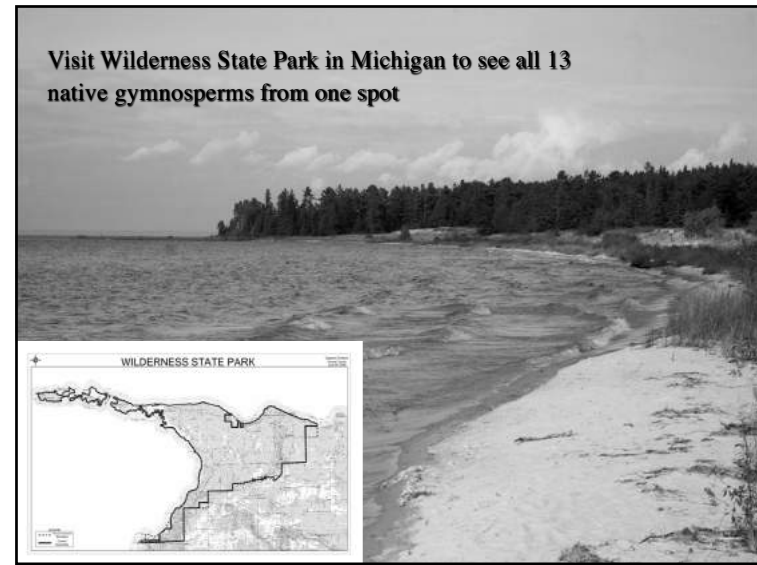
Seed bearing plants without flowers and pistils – Gymno-sperm = “naked seeds”

Gymn-asi-um =
“naked house”

2



3

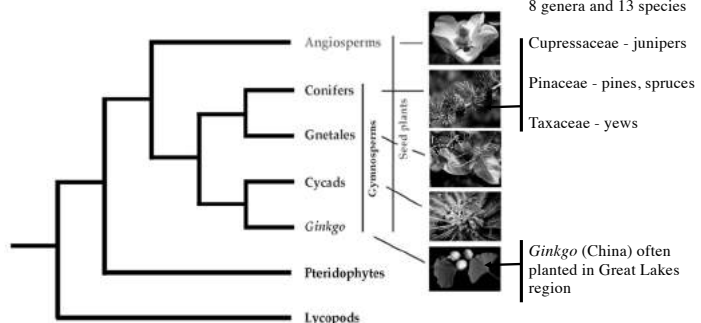


4

Pinophyta - Gymnosperms

Seed bearing plants without flowers and pistils – Gymno-sperm = “naked seeds”

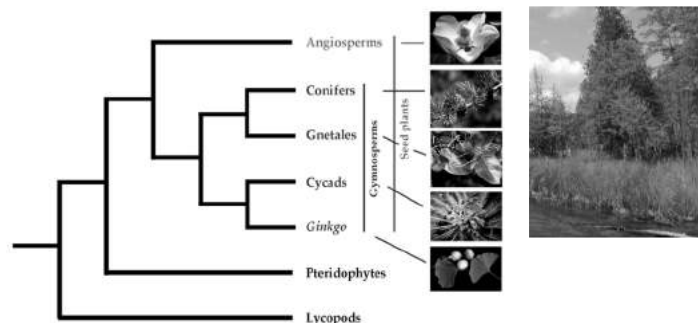
3 families of conifers only in Great Lakes region with 8 genera and 13 species



5

Pinophyta - Gymnosperms

- Less diverse than ferns: 12 families, 80 genera, 820 species
- Woody: trees, shrubs, lianas, few epiphytes
- Worldwide, but more dominant in colder and arctic regions

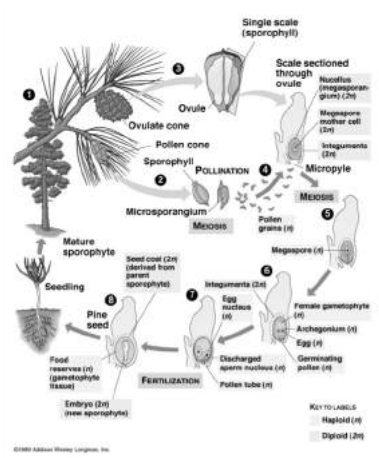


6

Pinophyta - Gymnosperms

General characteristics:

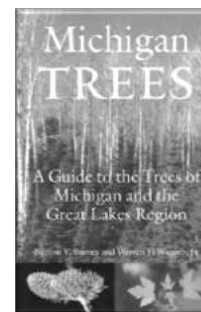
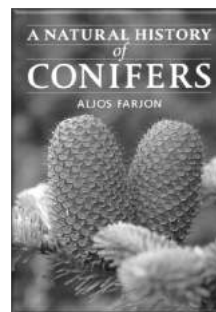
- Seeds!
- = mature ovule
- “naked seed” in cone
- No water required for sperm movement – pollen
- = male gametophyte (heterosporous!)
- pollinated by wind (mostly)



7

Pinophyta - Gymnosperms

Good books!



8

Pinophyta - Gymnosperms

Cupressaceae: cypress family


Leaves needle or scale-like
Opposite or whorled, persistent
Important rot resistant trees (redwood, cedar)

Thuja occidentalis
Arbor vitae, White cedar

Leaves opposite in 4 ranks
and heteromorphic

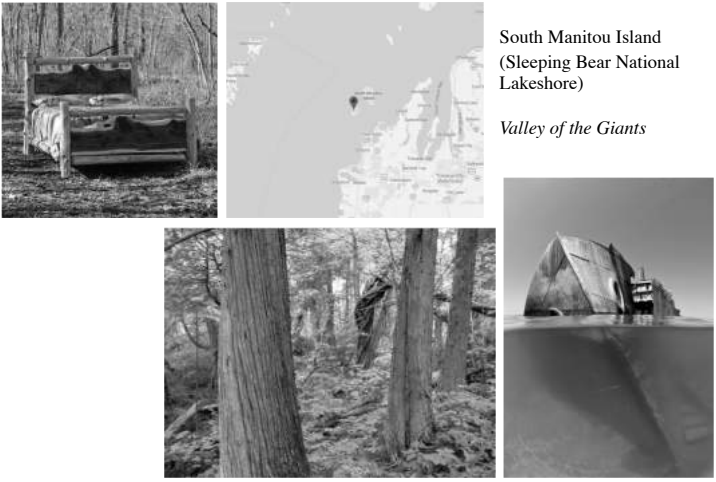
Branches flattened

Small woody cones



9

Pinophyta - Gymnosperms



South Manitou Island
(Sleeping Bear National
Lakeshore)

Valley of the Giants

10

Pinophyta - Gymnosperms

Cupressaceae: cypress family

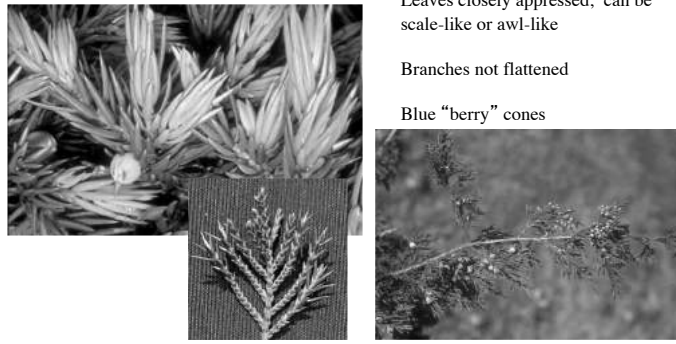
Leaves needle or scale-like
Opposite or whorled, persistent
Important rot resistant trees (redwood, cedar)

Juniperus
Junipers, Red cedar

Leaves closely appressed; can be
scale-like or awl-like

Branches not flattened

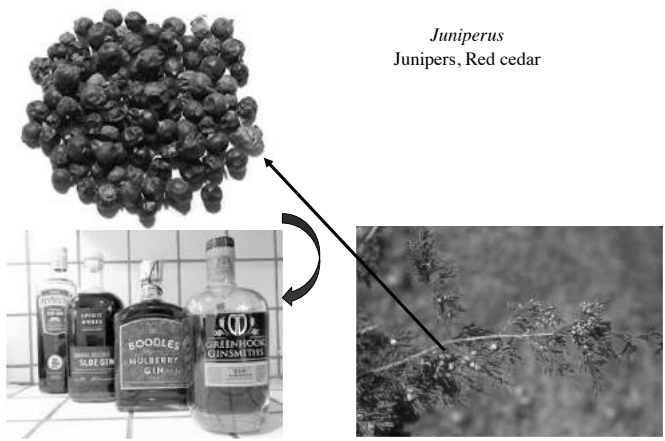
Blue "berry" cones



11

Pinophyta - Gymnosperms






Juniperus
Junipers, Red cedar




12

Pinophyta - Gymnosperms

Cupressaceae: cypress family *Juniperus virginiana*
Red cedar

Juniperus communis
Common juniper




Juniperus horizontalis
Creeping juniper

13


Pinophyta - Gymnosperms

Taxaceae: yew family


Leaves needle-like, spreading in one plane - 2 ranked
No cones, single seed in fleshy aril, but seeds naked
1 genus *Taxus*; taxol drug from western *T. brevifolia*



Taxus canadensis
American yew
Ground hemlock



Apostle Islands stand with no deer




14




Pinophyta - Gymnosperms

Taxaceae: yew family

Leaves needle-like, spreading in one plane - 2 ranked
No cones, single seed in fleshy aril, but seeds naked
1 genus *Taxus*; taxol drug from western *T. brevifolia*



Taxus cuspidata
Japanese yew






15


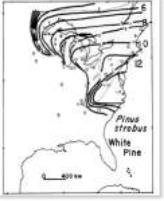
Pinophyta - Gymnosperms

Pinaceae: pine family


6 genera, 200 species of Northern Hemisphere
Foliage leaves needle-like, alternate or fascicled
Many seeds enclosed in fleshy to woody cone, with conspicuous cone scales



Pinus strobus
White pine


Alleghenian element






16

Pinophyta - Gymnosperms

Pinaceae: pine family





Pinus resinosa - Red pine
- more xeric than white pine






17

Pinophyta - Gymnosperms

Pinaceae: pine family






Pinus banksiana - Jack pine
- most xeric of the pines
- showing serotinous cones

18

Pinophyta - Gymnosperms

Pinaceae: pine family



Pinus banksiana - Jack pine

- Keystone species involving glacial geology, jack pine bud worm, defoliation, fire, serotinous cones, endangered Kirtland's warbler, and parasitic cowbird

19

Pinophyta - Gymnosperms

Pinaceae: pine family

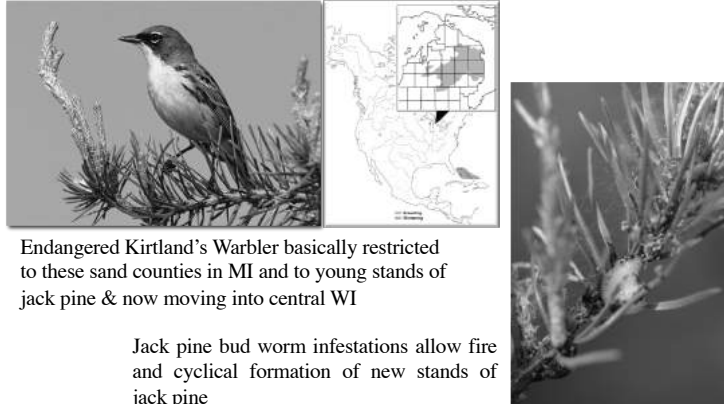
7 year old jack pine site – Crawford Co. MI

“sand counties” due to glacial melt off

20

Pinophyta - Gymnosperms

Pinaceae: pine family



Endangered Kirtland's Warbler basically restricted to these sand counties in MI and to young stands of jack pine & now moving into central WI

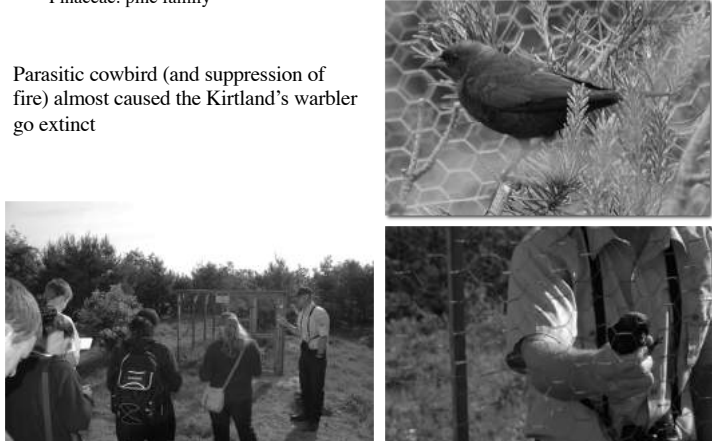
Jack pine bud worm infestations allow fire and cyclical formation of new stands of jack pine

21

Pinophyta - Gymnosperms

Pinaceae: pine family

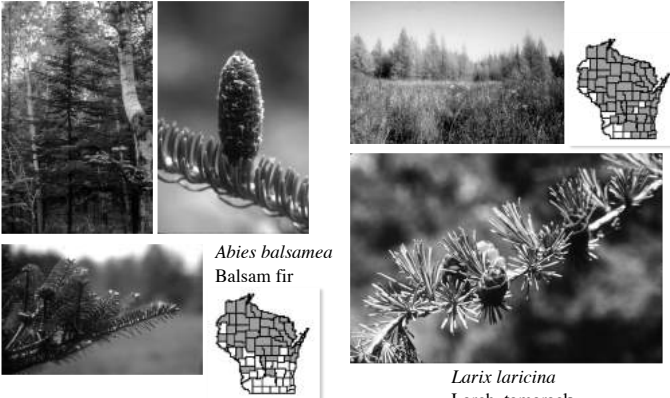
Parasitic cowbird (and suppression of fire) almost caused the Kirtland's warbler go extinct



22

Pinophyta - Gymnosperms

Pinaceae: pine family



Abies balsamea
Balsam fir

Larix laricina
Larch, tamarack

23

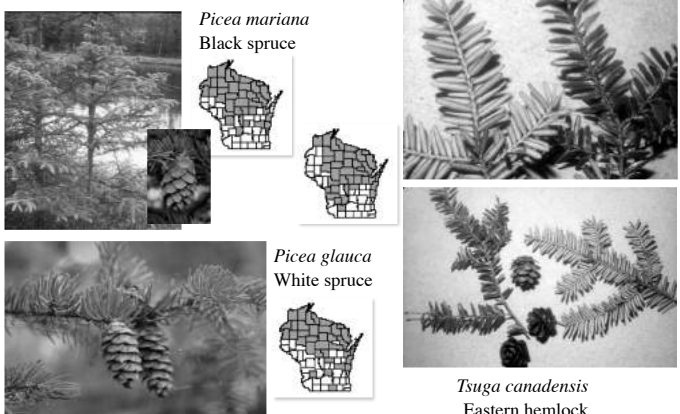
Pinophyta - Gymnosperms

Pinaceae: pine family

Picea mariana
Black spruce

Picea glauca
White spruce

Tsuga canadensis
Eastern hemlock



24