

Northwest Barrens Management

Applied Tools for Forestry & Birds (and bees)



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Objectives:

- **Introduction to the Northwest Sands Ecological Landscape in Wisconsin**
- **Overview of Planning Efforts in NW Barrens – Highlight recommendations**
- **Introduce Applied Forestry, Silviculture tools and techniques in Barrens Mgt**
- **What is working and Future Needs**
- **Feature a Landscape mgt effort for Birds and Forestry – Barnes Barrens (Bayfield cty forester)**

*****Thanks to Bob Hanson WDNR NW WLF bio for assistance**

NW Sands Ecological Landscape

NW Sands EL in Wisconsin = 1.2 million ac.

Globally rare Pine Barrens community is better represented in the Northwest Sands than in any other ecological landscape in Wisconsin



Northwest Sands Ecological Landscape

Changes over time

Presettlement

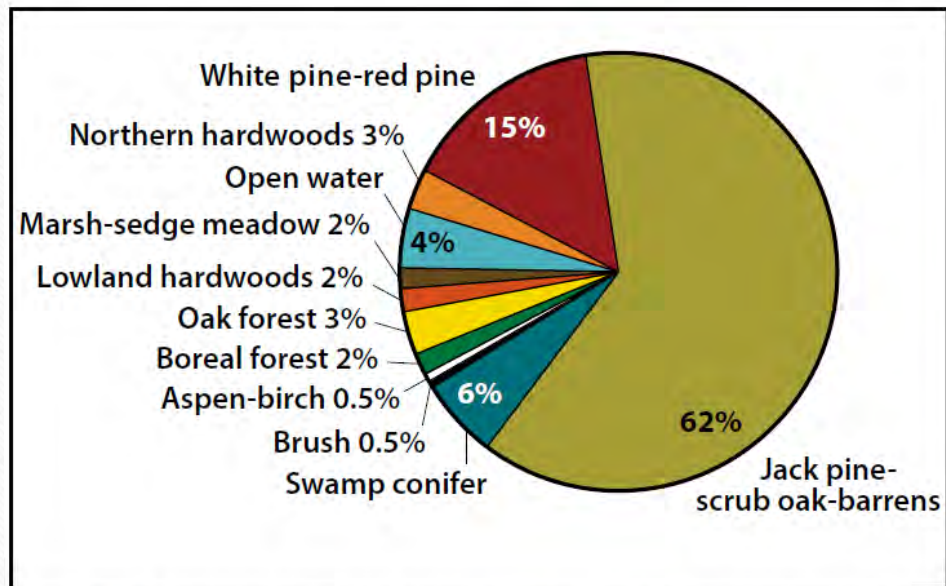


Figure 17.2. Vegetation of the Northwest Sands Ecological Landscape during the mid-1800s, as interpreted by Finley (1976) from the federal General Land Office public land survey information.

Current

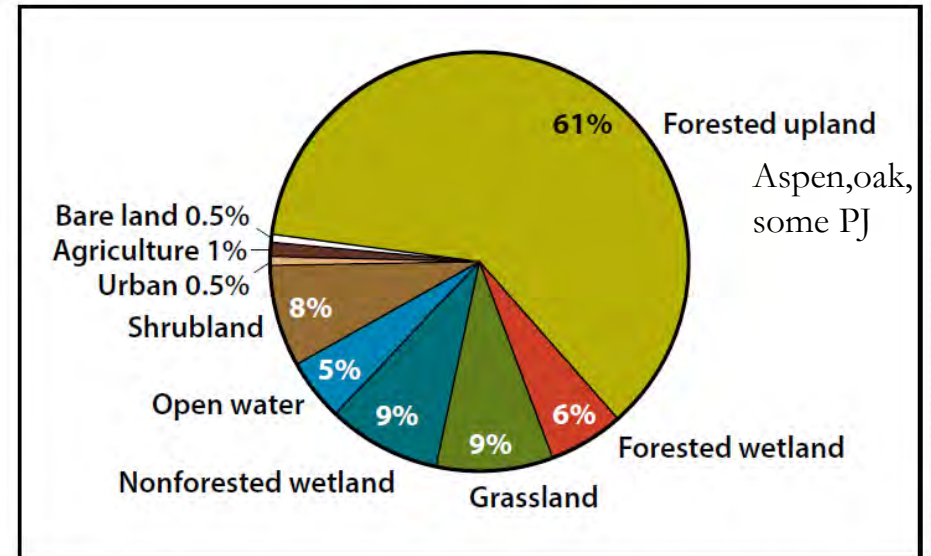


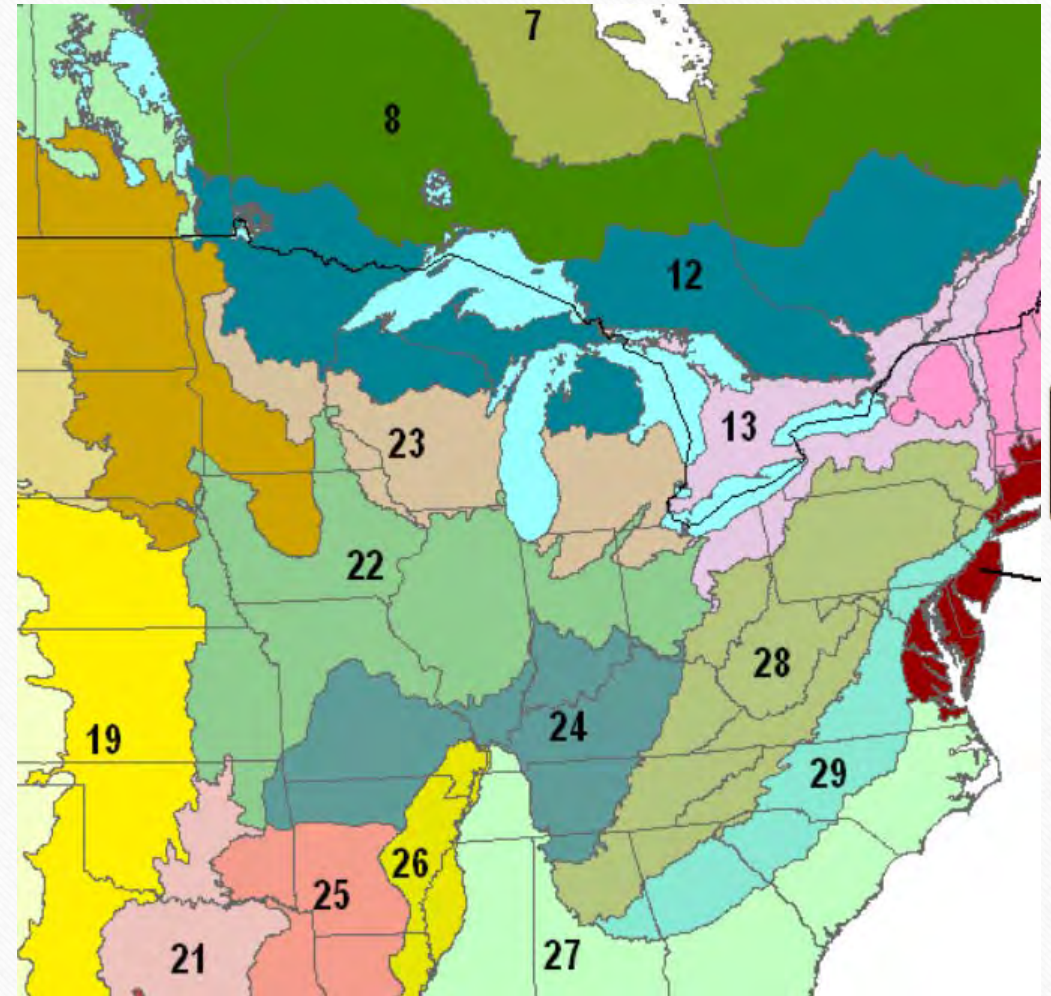
Figure 17.3. WISCLAND land cover data showing categories of land use classified from 1992 LANDSAT satellite imagery for the Northwest Sands Ecological Landscape (WDNR 1993).

NW Sands EL



Northwest Sands Ecological Landscape

BCR 12



Northwest Sands Ecological Landscape

Physical/Biotic Environment

Landscape context – outwash sandy

Composition/Structure: shifting mosaic with species composition structure varying with fire frequency/intensity

Glacial geology - xeric glacial outwash with pitted outwash (kettle lakes) and former spillway

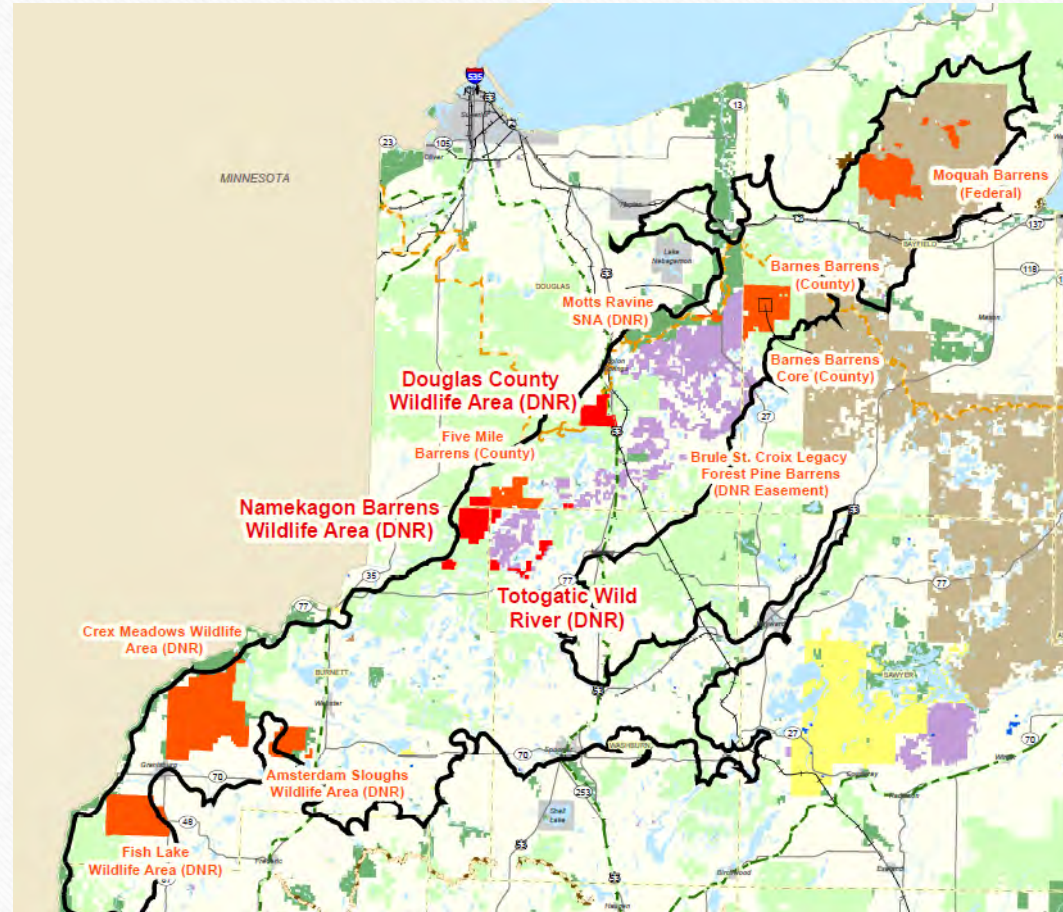
Hydrology – kettle & seepage lakes, large wetland complexes

Soils – excessive drained; strongly acidic, infertile

Natural processes – frequent fire; low nutrient, some windthrow and hail

Land Cover – dry forest (jack, red, white pine & oak); barrens, grasslands, agriculture, various types of wetlands

Barrens Property Mgt in NW WI



Past Planning Efforts, Research and Publications

Jack Pine Symposium
WDNR Ecological Landscape Handbook
Land Legacy
Wildlife Action Plan
FS - Moquah Barrens
Mott's Ravine SNA Plan
Namakagon Barrens Plan3
Crex Meadows MP
Brule River and Governor Knowles SF Master Plans
WDNR Silviculture Handbook



And well over 75 publications on research & planning 30 yrs+

Chapter 17 Northwest Sands Ecological Landscape



Integrated Opportunities for Forest Management in the NW Barrens

- Manage for globally rare pine and oak barren communities and associated species such as:
- Manage barrens and dry forests at larger scales
- Emulate landscape patterns and age-class structure created by natural fire
- Support for the critical wetland, marshes adjacent to barrens habitat
- **Provide corridors for these critical habitats and species**

NW Sands Species of Greatest Conservation Need

Select barrens-dependent SGCN (birds, reptiles and invertebrates only) listed by WDNR's Wisconsin Wildlife Action Plan
(<http://dnr.wi.gov/landscapes/index.asp?mode=detail&Landscape=2&Section=species>).

Reptiles & Amphibians

- Bullsake
- Northern Prairie Skink

Birds

- Black-billed Cuckoo
- Bobolink
- Brown Thrasher
- Eastern Meadowlark
- Field Sparrow
- Golden-winged Warbler
- Northern Harrier
- Red-headed Woodpecker
- Sharp-tailed Grouse
- Upland Sandpiper
- Vesper Sparrow

Invertebrates

- Karner Blue Butterfly
- Gorgone Checkerspot
- Tawny Crescent
- Henry's Elfin
- Olympia Marble
- Dusted Skipper
- Mottled Dusky-wing
- Cobweb Skipper
- Indian Skipper
- Phlox Moth
- Graceful Clearwing

Forestry Integration

- Identify opportunities where representative groups occur together
- Offer compositional, structural and functional attributes across the landscape
- Increase effective conservations areas during planning efforts
- Provide economies of scale for managers



What tree species?

Jack Pine

Scrub Oak

Paper birch, red and white pine, black cherry, aspen

Three-quarters of all jack pine in Wisconsin is naturally occurring (i.e., not planted), a result of fire or scarification treatments and logging disturbance.

In the Northwest Sands, the area of jack pine has decreased by 30% since pre-European settlement due to conversion, fire suppression and other forest health



PJ Seed Orchard Study

NW Barrens Silviculture: Considerations....only a few!

Species Composition

- Canopy, shrub, and ground layers
- Potential growth and competition
- Sources of regeneration, especially non-target species that may interfere with regeneration

Stand Structure

- Size class distribution and density
- Age class distribution

Stand and Tree Quality

- Overall stand health and vigor
- Crown form and vigor
- Stem form and quality
- Potential products (fiber vs. bolt wood)
- Genetic potential of current stand

Regeneration Potential

- Cone production
- Serotinous vs. non-serotinous
- Seedbed condition – scarification needs
- Depth to water table – available moisture

Site Quality

- Habitat type
- Site index
- Soil characteristics



Silviculture Techniques and Considerations

Regeneration harvest – **clear cut, seed tree, shelterwood harvests**

Biomass harvesting

Stocking – planting

Opening maintenance - <2 ac openings

Prescribed burning

Site Preparation - Mechanical and Chemical

Viewshed

Adjacent habitats (wetland)

Seed Tree illustration



8 year old PJ clear cut



Shelterwood illustration



Biomass harvest of scrub oak/PJ



Site Preparation

Proper site scarification is a critical element to ensure successful regeneration of jack pine. Standard logging operations often result in a disturbed forest floor, however the level of disturbance is often inadequate to create favorable seedbeds for jack pine regeneration



Roller chopper

Few years after
treatment



Site Preparation - Mechanical

Anchor chain



2 year after treatment



Prescribed Fire

Prescribed fire prepares a suitable seedbed and open serotinous cones. The fire needs to limit slash amounts and reduce the humus layer to less than 0.2 inches, exposing mineral soil. Prescribed burns are generally conducted in spring, early summer, or fall.

NHAL SF Seed Tree & Burn



Planting and direct seeding



KW in Raco Plains – planting design

Harvested areas are planted or naturally regenerated to a stocking density of 1,452 or more trees per acre (1,089 actual trees/acre) over approximately 75 percent of the treatment block, excluding openings.

Rolling Barrens concept

- Research has identified genetic isolation and lack of corridors in NW barrens
- Open barrens grows to young forest, middle aged, and mature forest providing benefits to a wide variety of species
- Mimics natural wildfire by using the working forest to supply the disturbance this system relies on, while growing trees.

Middle age



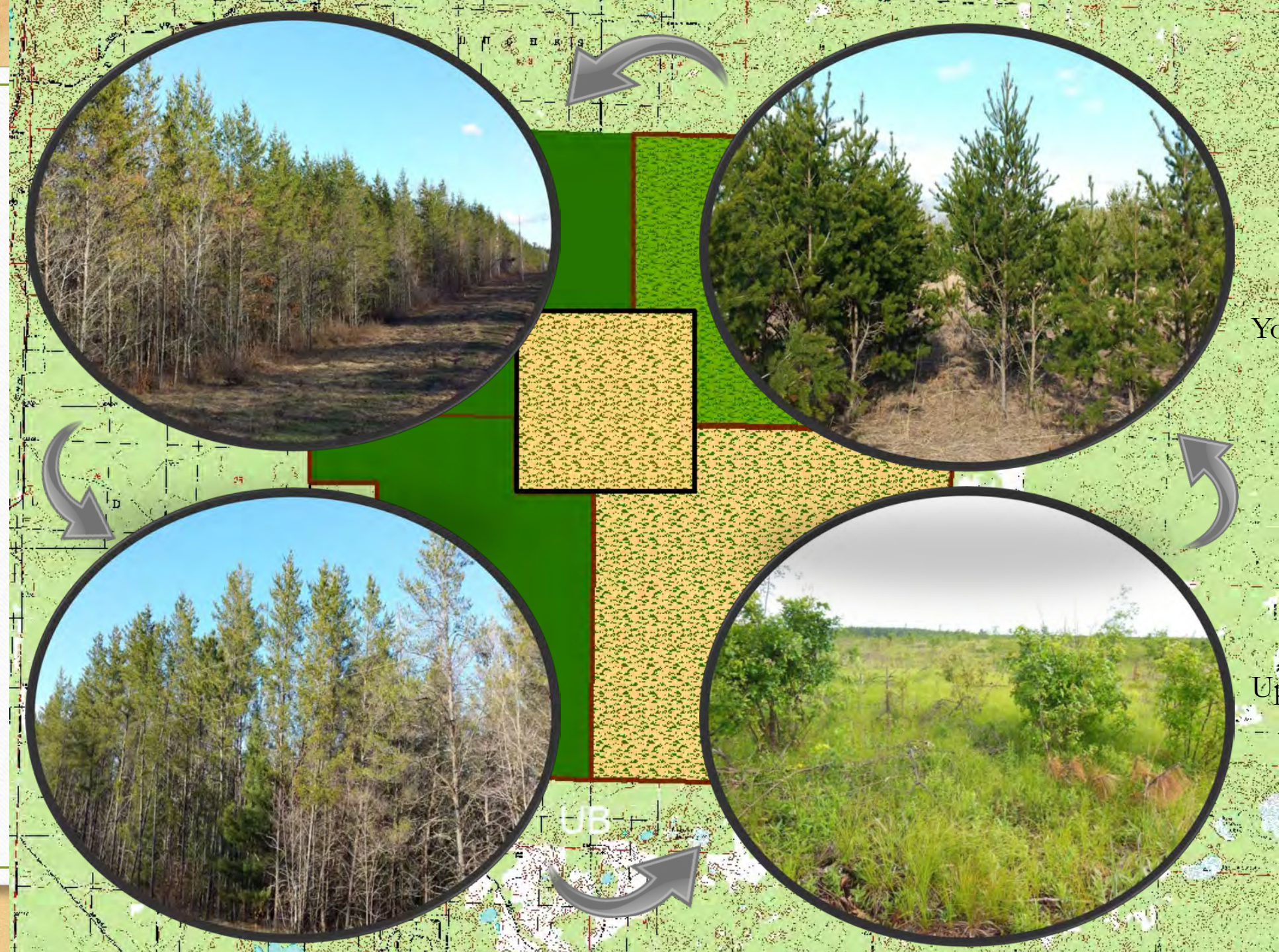
Young forest



Mature forest



Upland Brush





Connecticut
Warbler



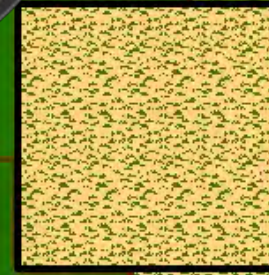
Kirtland's
Warbler



Whip-poor-will



Sharp-tailed
Grouse



UB

PR

Properties implementing Rolling Barrens

Mott's Ravine Area 1938, open landscape with regenerating barrens forests. Rolling Barrens with larger connecting harvests work mimic large historic fire, but with positive economics and today's working forest.

Barnes Barrens – Bayfield County

Washburn County – Hancock property

GKSF

Utilizing silviculture methods listed previously

Future Needs

Monitoring – share existing data and integrate into planning/implementation efforts

Resist conversion to other type – Keep PJ – PJ!! Educate private Landowners

Monitor Stressors: PJ budworm and Scleroderis may become more damaging – new pests?

Develop Silviculture strategies/ tools for foresters – PJ barren modules; highlight more Silv trials, Clone Bob Hanson

Landowner incentives

Manage Invasive species that reduce diversity

Consider the impacts of chemical herbicide vs mechanical and Rx fire

**Final thoughts: The Key to Intelligent tinkering
.....is share your knowledge and be patient! cm**

