Understanding the Key Characteristics of a Lost Landscape: A Modified Delphi Approach to Inform Pine Barrens Restoration

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Context

- Pine barrens once a major ecological type across the Northern Great Lakes Region
- Plantation forestry & fire suppression diminished presence to isolated remnants
- Restoration efforts are underway to increase pine barrens across their historic range

Study Purpose & Method

To understand key pine barrens characteristics to guide restoration efforts

- Modified Delphi, seeking consensus among experts
- Literature review/snowball sampling of pine barrens experts (n=50)
- Online administration
- Round 1, "What are the key characteristics of pine barrens?" (n=18)
- Round 2, Rate overall importance of identified characteristics (n=11)

Analysis

Identifying characteristics

- Content analysis open-ended questions
- Dual coders focused on major themes with supporting evidence
- Discussion & expert consultation led to final list of characteristics

Importance of characteristics

- Characteristic importance descriptively analyzed (Figure 1).

Panorama of Sleeping Bear Stewardship Sale prior to treatment, Lakewood Southeast Project, Chequamegon-Nicolet National Forest (USFS)

Results: Key Characteristics

Controlled burn, Spread Eagle Barrens, WI June 2016 (USFS)

Temporal-Ecological

- ***Fire-dependent, fire-adapted system***
- ***Periodic/recurring fire*** minimum 10 year intervals
- ***Dynamic*** temporally changing horizontal structure

Spread Eagle Barrens, WI October 2016 (USFS)

Spatial

- ***Large areas*** *at least 100s, preferably 1000s of acres)*
- ***Patchy mosaic*** *of trees, shrubs, grasses*
- ***Open canopy:*** *overall <25% canopy, with single and clumped trees*
- ***Large open areas*** *without any canopy trees*

Spread Eagle Barrens, WI June 2015 (USFS)

Vegetative

- ***Pine dominated*** Red & jack pine; some bur oak
- ***Variable vertical structure***
- ***Native species***
- ***Fire-influenced "architecture"*** e.g., thermal pruning
- ***Prominent shrub cover*** scrub oak, ericaceous sp.
- ***Thick groundcover*** of grasses and forbs

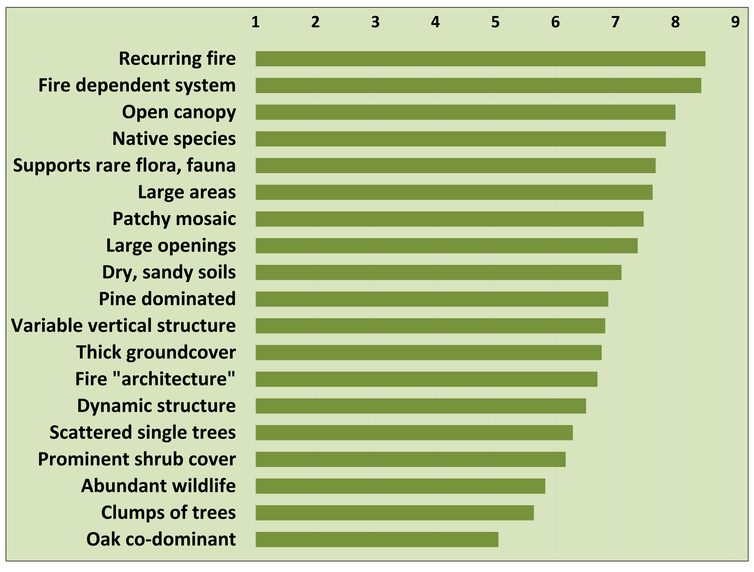

Fig 1. Round 2 results: Importance ratings of identified pine barrens characteristics (n= 11, 1= very unimportant and 9 = very important)

Rock outcrop, Lakewood Southeast Project, June 2015 (USFS)

Below Ground/Soil

- ***Dry, sandy soils*** excessively drained, may include parabolic sand dunes
- ***Nutrient poor***
- ***Geologic/hydrologic features*** rock outcrops and ponding/wetlands

Social/Economic

Blueberry picking, Spread Eagle Barrens, August 2000 (USFS)

- ***Aesthetics*** distant panoramas; lacking in mainstream "scenic" appeal
- ***Recreation*** berry picking, hunting, birding and wildlife viewing
- ***Cultural/historic*** traditional uses, place focus
- ***Economic*** difficult to justify mgmt. costs via timber sales

Unidentified Lepidoptera, Spread Eagle Barrens July 2009 (USFS)

Faunal/Habitat

- ***Fire adapted species*** fire dependent species
- ***Abundant food supply*** nuts and berries for mammals, flowers for pollinators and birds
- ***Abundant wildlife*** food supply can support high populations of some species
- ***Rarity/uniqueness*** supports rare native plants and animals

Sleeping Bear Stewardship Sale post-treatment fall 2017, Lakewood Southeast Project, Chequamegon-Nicolet National Forest (USFS)

Discussion

- Pine barrens are a complex combination of temporal, spatial, & vegetative characteristics with social considerations important
- Contributes to literature void of social research on pine barrens landscape
- Next steps: 1) understand the relative importance of these characteristics through respondent ranking & 2) create visual discrete choice model

Select resources of interest

- Floress, K., Haines, A., Usher, E., Gobster, P.H., and Dockry, M. 2018. Landowner and visitor response to forest landscape restoration on the Chequamegon-Nicolet National Forest. Stevens Point: University of Wisconsin – Stevens Point.
- Sturtevant, B. et al. 2016. Restoration of fire-dependent pine barren ecosystems in northern Wisconsin – Bridging the gap between research and management practices. Lake States Fire Science Consortium Webinar Series.

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