Boardman Sand Lakes Forest Biodiversity Stewardship Area

Introduction

The 3,935 acre proposed Boardman Sand Lakes Forest BSA is located 15 miles east of Traverse City along the Grand Traverse and Kalkaska County lines (Figure A-1). It has been proposed to represent a matrix-level Biodiversity Stewardship Area (BSA) of dry mesic northern forest (Kotar plant habitat class PArVHa). The proposed BSA also includes the Root Lakes and Sand Lakes Ecological Reference Areas, which are small patch examples of northern fen communities that are embedded in the overall matrix of dry-mesic northern forest.

The current predominant cover types are oak 1,455 acres (37%); red pine 736 acres (19%); aspen 447 acres (11%); jack pine 309 acres (8%); and white pine 161 acres (4%). The timber is second growth, having originated after the catastrophic circa 1900 landscape-level fires. There are very few early successional (<30 years) stands in the BSA, with the majority of stands in a mid-successional state (30-75 years old). The red pine stands are of both natural and planted origin and have had few harvest treatments. Some natural red pine is mixed with oak. The red pine is less than 80 years old, with the upper diameter classes ranging from 12-20 inches. There is some localized natural red pine regeneration occurring. There are also natural mixed white and red pine stands. Advanced white pine regeneration is a significant understory component in all cover types, along with lesser amounts of red maple and aspen. Most aspen and jack pine stands are poorly-stocked and are in the process of succeeding to white pine. There is little coarse woody debris currently present. There have been some low-intensity wild fires over the past 80 years.

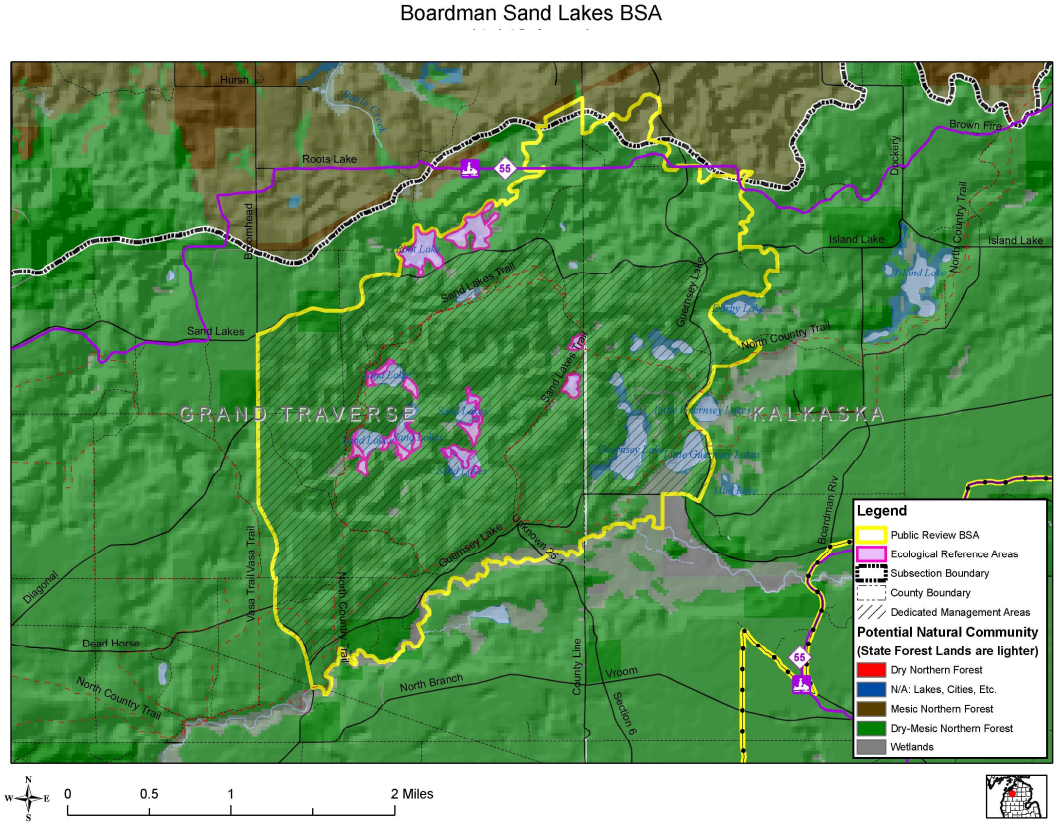

Figure A-1. Proposed Boardman-Sand Lakes Forest Biodiversity Stewardship Area.

Approximately 2,775 acres of the proposed area is designated as the Sand Lakes Quiet Area. The 1983 Sand Lakes Quiet Area Management Plan has been the primary driver of management of the Quiet Area. However, contrary to plan, there has been little active timber management in the Quiet Area over the past three decades. Motorized recreation is prohibited except for motorized access to the Guernsey Lake State Forest Campground and the boat launch on Big Guernsey Lake. There are approximately 12 miles of hiking/skiing trails including the North Country Trail. Dispersed camping is allowed within the Quiet Area and frequently occurs near the northern-most Sand Lake where there is a well and toilet. The Shore to Shore horseback riding trail crosses the southern portion of the area. The Fisheries Division actively manages one of the small unnamed Sand Lakes for rainbow trout.

The proposed BSA supports myriad wildlife species associated with closed-canopy mixed conifer forest, open water, and riparian corridors. Notable species include black-throated blue warbler, scarlet tanager, wood thrush, veery, American woodcock, ruffed grouse, wood turtle, white-tailed deer, and black bear. The area provides opportunities for wildlife-related recreation including hunting and bird watching and has historically supported white-tailed deer, ruffed grouse, woodcock, and black bear harvests.

Oil and gas development has occurred in the area and there have been proposals for future gas storage facilities. However, the Sand Lakes Quiet Area Management Plan has kept such activities to a minimum through requirements for slant drilling to the extent feasible and mitigation of impacts from pumps and electrical lines.

Desired Future Conditions

Desired future conditions are essentially vision statements for the desired future composition, structure, function, and stressors/threats for the major natural communities that occur in this BSA. The following desired future conditions apply to the proposed BSA:

Dry Mesic Northern Forest

Stands that are located on coarse- to medium-textured sand or loamy sand soils and Kotar habitat type PArVHa will be managed as dry-mesic northern forest (DMNF) communities.

The ideal future condition and composition of DMNF in this BSA is as follows:

- Natural regeneration and recruitment of red and white pine will continually occur in early successional stands, which will comprise less than 15% of the DMNF and will be dominated by pine, oak, aspen, or birch seedling/saplings (<30 years).
- Mid-successional stands will comprise approximately 60% of the DMNF with the following composition:
    - The majority will be mixed red pine-jack pine-oak dominated stands (30-75 years) with a mature bigtooth and trembling aspen-birch component, or young red pine-white pine stands (30-75 years).
    - Aspen and birch in these stands will be declining components; stands that were formerly dominated by aspen or birch will be in the process of succeeding to mixed pine-oak stands, with

recruitment of pine, red, black and northern pin oak, red maple and some American beech in progress.

- Late successional stands will comprise approximately 25% of the DMNF, with the following composition:
    - Most stands will be multi-aged, comprised of even-aged cohorts., with supercanopy and codominant overstory trees >75 year old.
    - Stands will be two-tiered or occasionally all-aged, with a low-density supercanopy white pine and/or red pine overtopping a medium density subcanopy of co-dominant pine and hardwood.
    - Supercanopy pine will be 100 to 300 years old.
    - Snags and coarse woody debris (CWD) will be well represented--a diversity of species, diameter classes will be maintained in various stages of decomposition.

The ideal natural disturbance regime to be emulated is as follows:

- Low intensity ground fire will occur every 5-20 years.
- Wind events will top the largest supercanopy trees periodically.
- Catastrophic disturbances (usually stand replacing fire, infrequent preceded by windthrow) could occur at 1,200 year return intervals.
- Disease or insect-caused mortality can occur at 120 to 300 year intervals. Size and shape of disturbances (patch size) are driven by landscape-level factors (terrain, cover types) but tend to be large patches with multiple cohorts often being completely replaced.
- Exotic invasive pests, plants, and diseases (such as oak wilt) will ideally be absent or maintained below epidemic population levels.

<u>Northern Fen</u>

Northern fen communities are restricted to kettle depressions in this pitted outwash landscape. Open conditions within fens are normally maintained by natural hydrologic and chemical conditions that limit the establishment and growth of woody plants.

Ideally fen species composition will be:

- Dominated by twig-rush, wiregrass sedge, blue joint grass, three-way sedge, spike-rushes, sheathed cotton-grass, white beak-rush, and bulrushes.
- Minor species will include tamarack, northern white cedar, black spruce, shrubby cinquefoil, sweet gale, and bog birch.

Structure will ideally consist of:

- A low shrub layer <1 meter height will dominate most of the area
- A tall shrub layer 1 to 3 meters high, often restricted to the periphery of the fen.
- Trees covering <10% of the area, scattered or in clumps, and often low in stature.

Site hydrology will be intact, with cold calcareous groundwater constantly saturating the soil.

The ideal natural disturbance regime to be emulated is as follows:

- Fire occurs occasionally in this fire-prone landscape.
- Windthrow of mature trees is frequent.
- Outbreaks of tree parasites (dwarf mistletoe) and insects (larch sawfly and larch casebearer) occasionally occur.
- High threat invasive species populations are rare or absent.

Short Term Management Direction (within 10 years)

- Actively manage single-species dominated pine stands (red pine and white pine) through selective or thinning harvests with retention of hardwood species to create a more natural stand appearance and structure, and to accelerate the conversion to mixed-pine and pine-oak stands.
- Final harvest jack pine dominated stands, which are starting to decline, with retention of white pine, red pine, oak and other hardwood species.
- Actively manage (maintain) aspen stands that are >50 years old that lack advanced white and/or red pine regeneration as a minor component of the BSA (<10%) through final harvests. Harvests will be restricted to produce smaller stand sizes (<20 acres) and include greater retention of coarse woody debris, snags and live mature stems of aspen, birch, oak and white and red pine than traditional aspen harvests.
- Do not conduct thinnings or other harvests in aspen, pine, or oak stands with existing well-stocked advanced regeneration of white pine and/or red pine in the understory until the regeneration reaches pole size.
- In oak stands with little white pine in the understory, use shelterwood harvests and prescribed fire to encourage oak regeneration and mimic frequent small scale natural disturbances (10 to 20 acres).
- Employ modified fire suppression tactics based on fire location, weather conditions, resource availability, safety, and property considerations.
- Retain all hemlock trees. Under-plant mesic conifers (including hemlock) on north and east-facing slopes, in stands where natural seed sources are lacking.
- Maintain site hydrology of fens by preserving forested buffers, reducing illegal ORV use, and minimizing intrusive management activities.
- Place high priority on control of high risk invasive species in BSAs.
- Follow previous direction in the Sand Lakes Quiet Area Management Plan for oil and gas development. Maintain existing developed oil and natural gas well pads outside of the Quiet Area.

Long Term Management Direction (100+ years)

- Maintain up to 15% of the BSA on a rotating basis as early successional pine, oak, aspen, or birch stands (<30 years old).
- Manage up to 60% of the BSA as mid-successional (30-75 years old) red and white pine, and mixed red pine-jack pine-oak.
- Manage approximately 25% of the BSA as late-successional white pine and red pine stands in even-aged cohorts that range in age from 100-300 years, with a mixed pine-hardwood sub-canopy.

- Manage red and white pine dominated stands to:
  - Convert to mixed pine and/or mixed pine-oak stands through thinning or selection harvests.
  - Encourage development of multiple even-aged cohorts
  - Retain a supercanopy of red and/or white pine.
- Manage oak-dominated stands to:
  - Encourage greater dominance by white and/or red pine through shelterwood or final harvests with retention of pine seed trees,
  - Harvest and regenerate large irregular blocks (up to 800 acre areas) of pine-oak to mimic natural catastrophic disturbances.
  - Use prescribed burns in combination with harvests to encourage natural regeneration of pine and oak.
  - Re-plant red pine where natural regeneration fails.
- Manage aspen stands to:
  - Passively convert/succeed stands in excess of 10% of the BSA to pine- or mixed pine-oak dominated stands.
  - Maintain other aspen stands (up to 10% of BSA acreage) via final harvest at 30 to 40 years.
- Retain or augment snags and coarse woody debris (CWD) in all stands in greater amounts than under standard retention guidance, maintaining a diversity of species and diameter classes and in various stages of decomposition.
- Passively manage fens with little to no active prescriptions.
- Mimic natural disturbance in fens using selective felling, prescribed fire, or modified fire suppression to reduce encroachment from shrubs or woody vegetation.
- Maintain the existing recreational infrastructure (campground, boat access site and pathways) as outlined in the Sand Lakes Quiet Area Management Plan.
- Remediate oil and gas sites to a forested condition through active planting when wells are depleted and capped.
- Allow new oil and natural gas well development on currently leased lands and lands with a current lease classification of “Development” or “Development with restrictions”.

Standards

1. Sand Lakes Management Plan, DNR, 1983. To be revised to meet BCPP guidelines.
2. Roots Lake ERA Management Plan, DNR, 2009
3. 2007 Inland Consent Decree

Guidelines

1. Use DNR BSA silvicultural guidelines for management of forest cover types within natural communities.
2. Michigan Natural Features Inventory community abstract for Northern Fens.
3. Michigan Natural Features Inventory community abstract for Dry Mesic Northern Forests.