

Lost Lake Bog and North Lost Lake Bog ERA Plan

Administrative Information:

- Location:
 - Traverse City Forest Management Unit
 - Benzie Outwash Management Area
 - Compartment 61061, stands 38 & 41 – Lost Lake Bog (LLB), and stand 21 – North Lost Lake Bog (NLLB)
- Geo-political location:
 - Grand Traverse County
 - T27N R12W sections 30 & 31
- Contact information:
 - Plan writer: Timothy Webb, TCFMU forester
 - Wildlife Biologist: Stephen Griffith
- Ownership: State of Michigan
- Existing infrastructure/facilities: Lost Lake Pathway runs parallel to the north and west sides of the LLB; the Michigan Shore to Shore Riding/Hiking trail runs near the south side of the LLB.
- Other documents related to this ERA:
 - a draft ERA management plan dated 5/18/2009 was written during the previous compartment planning cycle.
 - MNFI element occurrence records detail flora, threats, and management recommendations for these 2 bogs. Some text from these records is included in this plan.

Conservation Values

Bogs are nutrient-poor peatlands characterized by acidic, saturated peat and the prevalence of sphagnum mosses and ericaceous shrubs. Fire and flooding are the main natural disturbance factors. High-quality bogs contain characteristic plants and animals and minimal invasive species populations. Hydrology should be unimpeded by ditches, dikes and fill. Viable bogs are also surrounded by high-quality natural communities or with a sufficient upland buffer for minimizing surface water input and sedimentation and to maintain groundwater regimes.

- Description of the natural community occurrence for the Lost Lake Bog:
 - MNFI element occurrence ID 11575, rank B; last observed 8/23/2006
 - ERA designation is for a representative example of a natural bog community. This bog is one of 22 bog element occurrences within Subsection VII.3. In addition, it is one of seven bogs ranked B or higher within Subsection VII.3, one of 19 bogs ranked B or higher within Section VII, and one of 30 bogs ranked B or higher within the state.
 - Lost Lake Bog is a lake-filled, ombrotrophic bog that occurs in a kettle depression in a pitted outwash plain with deep, strongly acidic (pH 4.5-5.0) saturated sphagnum peat overlying acidic (pH 5.0) sands. The overall topography is flat with sphagnum hummocks and hollows providing diverse microtopography and fine-scale gradients in soil moisture and chemistry. The site is

surrounded by mature second growth dry-mesic northern forest with dirt roads and trails throughout the landscape. The bog is characterized by three primary ecological zones: a grounded mat with higher tree density, broad areas of open bog dominated by leatherleaf (*Chamaedaphne calyculata*), and a floating bog mat with increased importance of graminoids. The shrub layer is dominated by leatherleaf, bog laurel (*Kalmia polifolia*), and bog rosemary (*Andromeda glaucophylla*) with areas along the lake margin supporting whorled loosestrife (*Decodon verticillatus*) and areas along the upland margin supporting mountain holly (*Nemopanthus mucronata*), huckleberry (*Gaylussacia baccata*), and blueberries (*Vaccinium* spp.). The herbaceous layer is dominated by few-seed sedge (*Carex oligosperma*) and cotton-grasses (*Eriophorum* spp.) with twig-rush (*Cladium mariscoides*), white beak-rush (*Rhynchospora alba*), small cranberry (*Vaccinium oxycoccos*), pitcher-plant (*Sarracenia purpurea*), and round-leaved sundew (*Drosera rotundifolia*) prevalent on the floating mat adjacent to the lake. Sphagnum species dominate the ground cover throughout the site. Three-way sedge (*Dulichium arundinaceum*) is a local dominant in areas of shallow peat over sand close to the upland margin. The scattered and stunted canopy in areas of treed bog is dominated by white pine (*Pinus strobus*), black spruce (*Picea mariana*), and tamarack (*Larix laricina*) with trees ranging in DBH from 4 to 20 cm and in height from 15 to 40 ft. Over thirty vascular plant species were noted during the survey.

- Description of the natural community occurrence for the North Lost Lake Bog:
 - Bog; element occurrence ID 8430, rank AB; last observed 8/23/2006
 - ERA designation is for a representative example of a natural bog community. This bog is one of 22 bog element occurrences within Subsection VII.3. In addition, it is the highest ranked bog within Subsection VII.3, one of six bogs ranked AB or higher within Subsection VII, and is one of 11 bogs ranked AB or higher within the state.
 - This bog occupies a kettle depression in a pitted outwash plain with deep saturated sphagnum peat overlying wet sands. Both organic and mineral soils are acidic. Overall topography is flat with sphagnum hummocks and hollows providing diverse microtopography and fine-scale gradients in soil moisture and chemistry. The site is characterized by high species diversity (over 50 species) with complex ecological zonation. Minimal anthropogenic disturbance was noted. The bog is surrounded by mature second-growth dry-mesic northern forest with dirt roads and trails throughout the landscape. Four primary ecological zones characterize the site: open bog, treed bog, floating mat, and poor fen. The open bog is characterized by deep acidic sphagnum peat dominated by leatherleaf (*Chamaedaphne calyculata*) with bog laurel (*Kalmia polifolia*) and few-seed sedge (*Carex oligosperma*). The treed bog has an open canopy (10-25%) of scattered and stunted black spruce (*Picea mariana*) and tamarack (*Larix laricina*) that range in DBH from 4 to 20 cm and in height from 15 to 40 ft. The low shrub layer in this zone is dense and dominated by ericaceous species, namely leatherleaf, bog laurel, and low sweet blueberry (*Vaccinium angustifolium*). The floating mat is extensive with 20 to 40 cm of fibric peat over water. White-beak-rush (*Rhynchospora alba*) is dominant on the mat with prevalent species including pitcher-plant (*Sarracenia purpurea*), cotton-grasses (*Eriophorum* spp.) and patches of twig-rush (*Cladium mariscoides*) and yellow-eyed grass (*Xyris torta*). Numerous pockets of poor

fen occur along the wetland margin and a larger pocket of poor fen is found at the north end of the complex. Poor fen inclusions are characterized by slightly acidic sedge peats (60 cm deep) over circumneutral sand dominated by wiregrass sedge (*Carex lasiocarpa*) and bluejoint grass (*Calamagrostis canadensis*).

- Other High Conservation Values Present: none.
- Other Values for Consideration:
 - Recreation: Both the Lost Lake Pathway and the Shore to Shore Riding-Hiking Trail run near the LLB. The bog provides scenic variety for trail users in an otherwise heavily forested landscape.
 - The presence of ebony boghaunter (*Williamsonia fletcheri*), a special concern species, was documented in 1999.

Threats Assessment

- Because of proximity of these bogs to roads, off-road vehicle damage is a threat. Some ORV damage has occurred in the past, but recent damage is not evident.
- Logging of surrounding forest could alter the hydrology of the bogs by increasing surface runoff and sedimentation into the wetlands.
- Leaking petroleum products from ORVs or logging equipment could pollute the bogs.
- Invasive species establishment could threaten the abundance and diversity of native plants. There are no known invasive species at this time.
- Fire suppression eliminates a natural process important to the long-term dynamics of these bogs.

Management Goals

- Maintain natural hydrology within the bogs.
- Maintain the natural diversity of native plants and animals; minimize potential for invasive species establishment.
- Keep bogs free from vehicle damage.
- Allow natural processes to occur unimpeded.

Management Objectives

- Eliminate any obvious accesses for motorized vehicles to the bogs; limit access to the bogs to foot traffic only.
- Establish a forested buffer surrounding the bogs where logging will not occur.
- Allow natural wildfires to burn through the bog habitat without suppression.
- Monitor for and address invasive species.
- Reassess EO quality every 10 to 20 years.

Management Actions

- Inventory the area surrounding each bog on foot to detect any ORV access points during each compartment review cycle, beginning in the 2017 field inventory for Year of Entry (YOE) 2019. Continue to monitor as timber sales and other prescriptions are set up in nearby stands. Simultaneously monitor for invasive species.

- Install earthen berms, boulders, or barrier posts at appropriate choke points to block vehicles via any access points before or during the YOE. Use signage as necessary to inform the public of road and trail closures.
- As nearby timber stands are commercially harvested, strategically place slash to block and obliterate illegal ORV trails.
- Designate a Special Conservation Area (SCA) for approval during the 2019 YOE compartment planning process surrounding each bog to serve as a forested buffer. Also include a smaller bog (compartment 61061, stand 13) for protection within the SCA surrounding the NLLB. Use a combination of existing roads, slope breaks, and stand boundaries to define these SCAs. Buffer width should be at least 100 feet where possible, although some established roads and trails are less than that distance from the bog edges. Apply a site condition to these areas to exclude them from consideration for logging.
- Add appropriate information to wildfire plans and maps to inform wildland firefighters of the desire to leave unsuppressed any fires within the bogs.
- Eliminate any invasive plants found using appropriate control methods for the species to be removed.
- Work with the DNR Law Enforcement Division to regularly patrol for illegal ORV activity and to enforce state land use rules.
- Work with MNFI and other experts to update the element occurrence inventory information periodically.

Monitoring

- Monitor periodically for invasive species and ORV abuse:
 - Inspect the periphery of the bogs during compartment review on a 10-year cycle.
 - Check for signs of illegal activity when setting up and administering timber sales in nearby stands (compartment 61011 or 61061).
 - Encourage local botanists who visit the bog frequently for study/teaching purposes to report any invasive species presence or ORV damage observed:
 - Liana May, Borealis Botanical Consulting, Traverse City, 231-835-0636, borealisbotanicals@gmail.com
 - Jenna Scheub, Interlochen Arts Academy, 231-276-4767, jenna.scheub@interlochen.org

Signatures & Approval Date:

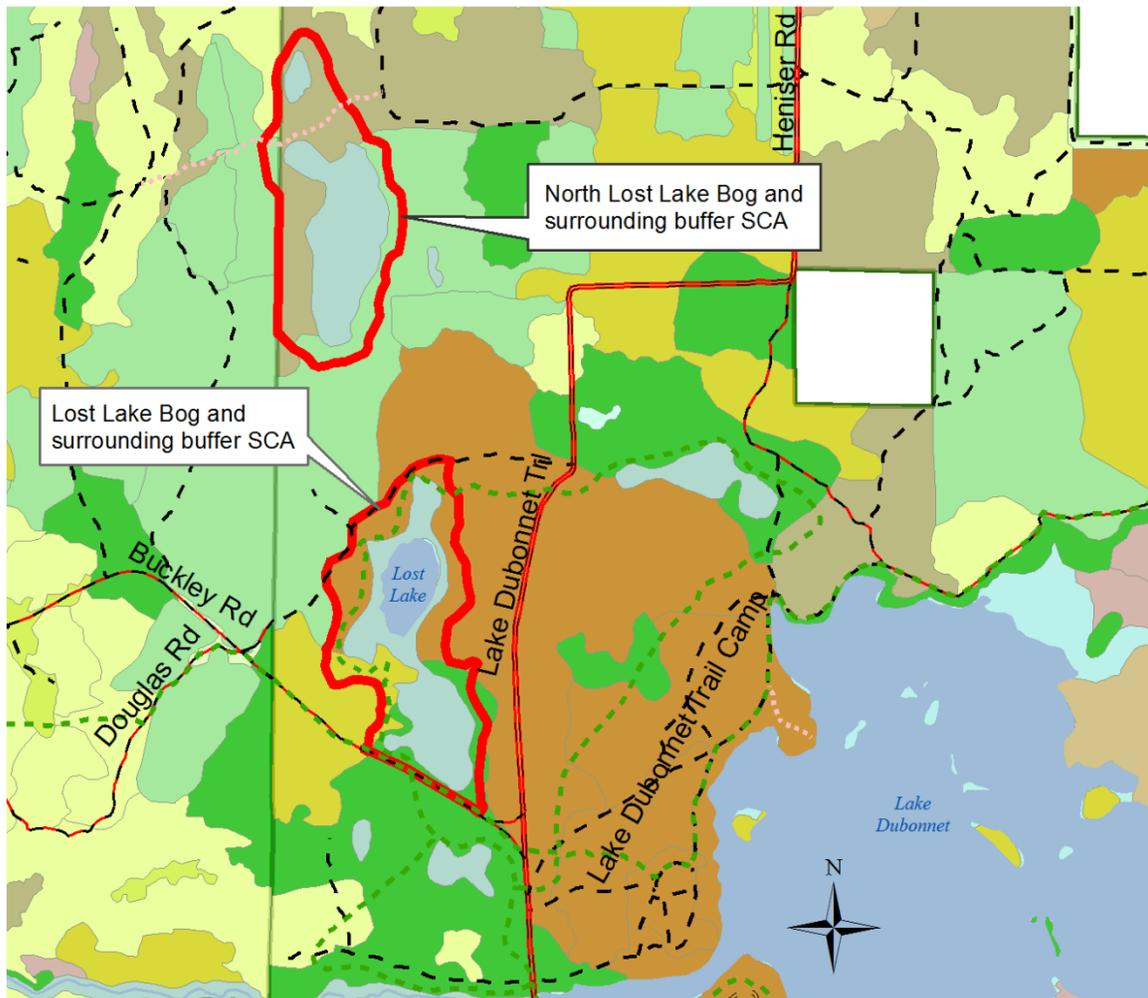
- Each plan will require formal approval from all relevant resource divisions
- Date of final approval



Figure 1. North Lost Lake Bog

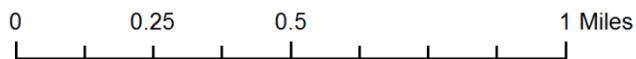


Figure 2. Lost Lake Bog



Legend

- SCA/ERA boundary
- Designated Hiking Trails



Stand Covertype

Forest Covertype

- 411 - Northern Hardwood
- 412 - Oak Types
- 413 - Aspen Types
- 419 - Mixed Upland Deciduous
- 421 - Planted Pines
- 422 - Natural Pines
- 430 - Upland Mixed Fores
- 612 - Lowland Coniferous Forest

Non-Forest Covertype

- 310 - Herbaceous Openland
- 330 - Low Density Trees
- 500 - Water
- 622 - Lowland Shrub
- 623 - Emergent Wetland

