

Long Lake Conservation Center:

Management Plan To Meet FSC Standards

Landowner: Long Lake Conservation Center
Aitkin County Land Dept.
28952 438th Lane
Palisade, MN 56469

Telephone: 800-450-5522 or 218-927-7364

Date: December 15, 2006

Property Location: All of Section 13, T.48N-R25W &
E1/2, NE1/4: S.14, T.48N-R25W &
NESE: S.14, T.48N-R25W
Aitkin County, MN

Plan Acres: 749

Total acres: 760

Property Description:

The Long Lake Conservation Center (LLCC) is located approximately five miles south of Palisade MN and is owned and managed by the Aitkin County Land Department (ACLD), in cooperation with the staff from LLCC. Current access to the property is from the west via County Highway 5.

There are a wide variety of cover types and habitats on the LLCC property with lowland conifers, upland hardwoods, and grass and shrub wetlands the most common types. Approximately 30% is in lowland conifers, 25% in upland hardwoods, and 20% in wetlands. The remaining areas contain open water, riparian areas, the main campus, and small amounts of upland conifers. In addition, significant portions of the forestlands near the campus are designated as learning areas.

This management plan and the accompanying maps will supplement previous management plans and inventories of the property, and also provide the basis for special management approaches given the educational and recreational goals of the Center.

Prepared By:

Peter P. Bundy
Masconomo Forestry
PO Box 129
Crosby, MN 56441

218-546-7626

Beth Jacquain
Asst. Land Commissioner
209 2nd St. NW
Aitkin, MN 46431

218-327-4965

Landowners goals:

The outstanding goals of LLCC forest management are to integrate educational and recreational activities with active forest management. In addition, this plan should help the Center meet Forest Stewardship Council (FSC) criteria for a well managed forest and provide for demonstration sites for outdoor education classes and for forest management activities.

With this in mind, more specific goals have been identified by the leadership at LLCC as priorities for management of the property.

- To provide **educational opportunities** for the many students who visit LLCC each year. More specifically, management should enhance outdoor environments for classes, including 1) bog walk, 2) orienteering, 3) wilderness meal, 4) Alpha wolf, 5) Woodcock habitat and mating and 6) the Thicket class.
 - To provide “working forest” **demonstration sites** for a variety of forest management activities, including 1) Red pine management 2) Aspen management 3) White pine restoration 4) Oak and northern hardwood stand improvements.
 - To provide **recreational opportunities** for guests to the county park. This includes 1) Maintained hiking and ski trails and 2) Signed nature walks.
 - To enhance the **native wildlife habitat** on the property.
 - To provide a **model** for observing “sustainable forestry” implemented on the ground.
 - To protect the **aquatic zone** of Long Lake for aesthetics, avian and mammalian habitat, classes on lake bottom organisms and other wildlife and water quality benefits.
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Background of Regional Ecology

Landscape Region:

Landscape regions are distinctive areas of the state with similar combinations of ecological and geological characteristics that set them apart from other areas. This property is located in both the St. Louis Moraines and Tamarack Lowlands landscape subsections. (see Map I)

St. Louis Moraines:

End moraines are the dominant landform in this subsection. Glacial drift ranges from 100-200 feet in depth. Loamy calcareous soils make up about 75 percent of the soils. White pine and red pine covered large portions of the moraines. Along the eastern outwash edges of the subsection, there was a mixture of northern hardwoods, pines and aspen cover types. Conifer swamps and bogs were scattered throughout.

Tamarack Lowlands:

The boundaries of the Tamarack lowlands coincide with the landform boundaries of Glacial Lake Upham and the Aurora till plain. Level to gently rolling topography is characteristic with the largest landform consisting of the old lake plain. Lowland conifers (black spruce, tamarack and white cedar) dominated pre-settlement vegetation. Sedge meadows were also extensive. Uplands supported aspen and birch and pines were located on the ground moraine at the edge of the lake plain but were not extensive. Soils include extensive areas of histosols (peats) over lacustrine deposits.

Surrounding area characteristics:

The climate in Aitkin County is characterized as sub-humid continental with severe winters. Annual precipitation averages 28". Two in ten years will have less than 22" and two in ten years will have more than 33".

The surrounding area is 40-60% wooded, 10-20% agricultural and 20-30% wetlands. The remainder of the landscape is rural residential or water. The area is rural in character with a growing summer recreational population. Agricultural land use has declined slightly in recent years, while summer residencies on nearby lakes have increased.

Soils:

The upland soils are primarily Branstad loams, formed from glacial till. These soils are deep and well suited to forestry. The wetland and lowland conifer soils are primarily Greenwood peats, which are fragile and very susceptible to equipment damage.

Additional soils from the local soil maps (see Appendix III) include Alstad loams, Cushing-Mahdomedi complex sandy loams, and Loxley peats.

Natural Heritage Database:

The MN Natural Heritage Database (NHD) contains listings of the threatened or endangered species which have been found and documented on the LLCC property.

These include Robin's Spike Rush, Slender Naiad, Snailseed Pondweed, and Humped Bladderwort. Bald Eagles have also been spotted in the area although no known nests occur on the LLCC. The locations of the plant species have been identified by the center, and will be monitored prior to any forest management activities.

Trail planning and management will consider the protection of all known locations of rare, threatened, and endangered plants identified through the NHD.

While the NHD is a reliable indicator of rare, threatened and endangered species, it is also incomplete. For this reason we encourage LLCC to continue to monitor for uncommon plant and wildlife species.

Cultural Resources:

The State Archeologist does not have any records of documented historical sites on this property. There was an old farmstead on the property in the early to mid 20th century. It is not known if tribal artifacts have been found near the lakeshore.

Native Plant Communities

Most of the woodland areas of LLCC are in fire dependent communities. Aitkin County Land Department is in the process of training its resource managers in Native Plant Community (NPC) classification. When this training is complete LLCC should be able to include NPC information on its inventory and use this to facilitate management decisions.

History of the Center:

In 1963 Aitkin County accepted the donation of 200 acres of land from the Southwest Minneapolis Kiwanis Club. The goals of the club were to help establish an environmental learning center on the property.

In 1965 Long Lake Conservation Center inaugurated the Conservation Leadership School summer camp. This was one of the first residential environmental learning programs in the state for K-12 boys and girls.

With funding from the Blandin Foundation, the facilities were expanded in the early 1970's and LLCC initiated a school year program entitled "The Long Lake Experience". Seventy three sixth graders from Earle Browns Elementary school were the first to attend in 1972.

By the early 1980's, the LLCC programs were accredited as a Special Function School and the Long Lake Conservation Foundation was chartered. In 1992 Long Lake's 100,000th student visited the center.

In the late 1990's the school facilities again expanded. A new dining hall and the North Star Lodge dormitory were built. Executive director Bob Schwaderer celebrated his 25th year as leader of the Long Lake programs.

In 2003 Mr. Schwaderer retired after 29 years with Long Lake. Todd Roggenkamp was selected to become the second director of the camp.

Photo of the Center

CAMPUS

Type: C

Acres: 11

Type description:

This is the main campus for Long Lake Conservation Center. The area contains 6 principal buildings, including a dormitory, dining hall, administration building, staff housing, power plant, and a classroom building. There are three parking lot areas and a beach area along the lake with recreational facilities for canoeing and other aquatic activities.

The campus is located in an Oak Type forested area, with significant mature red oaks, particularly on the northern half of the campus. There are also a couple of wetlands located inside the campus area, the largest of which is west of the dormitory.

Desired Future Condition:

Maintain as the main campus.

Recommendations:

While the main campus does not figure directly into this management plan, and will be managed primarily by the LLCC staff, there are a couple of considerations which should be noted. Of greatest importance, is the presence of a number of hazard trees on the campus itself. All hazard trees should be marked and removed as quickly as possible to avoid possible injury and liability issues for visitors.

In addition, some consideration should be given to the health of the wetland areas within the campus. Staff and local expertise may be helpful in determining the best approach to wetland protection and enhancement. Future management might consider such protective actions as kiosks, enhanced buffer areas, or wildlife plantings.

Area for photograph

Learning Areas

Surrounding the main campus of LLCC are a series of learning areas where student educational activities are a high priority for the center. These have been designated as

- Learning Area North
- Learning Area South
- Learning Area West

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LEARNING AREA NORTH: Type: LAN Acres: 87

Inventory # : 13/3; 13/5; 13/9; 13/10;13/30;14/8; 14/9

Type descriptions:

This area contains a number of cover types, including an old field, a mature oak woodland, a young white pine planting and a spruce-tamarack bog. A public Road also bisects this area.

Important educational activities which occur in this area include the bog walk, Woodcock habitat demonstrations and naturalist demonstrations of red pine Management.

Management Objectives & Desired Future Condition:

Old field: Maintain in woodcock mating habitat through periodic burns.

Red Pine: Establish a variety of thinning harvest for forest management demonstrations.

Black Spruce: Maintain the health of the spruce-tamarack bog for classes.

Road: Reduce off campus traffic levels and speeds for student safety.

Recommendations:

Old Field: (#13/10)

This area is currently listed as type 13/10 UG. It contains both grasses and small shrubs; including raspberries, willow, dogwood and sumac. Recommendations are to formalize a biannual burning program in collaboration with ACLD personnel to maintain a certain percentage of open, prairie like conditions. The burning program should employ trained personnel and include established protocol for fire breaks, back-up safety equipment, and burn windows. A burning prescription should be developed in writing before each burn.

Red Pine Planting: (#13/30)

This area is currently listed as type 13/30 NP45. It contains 40 year old red pine planted on an old field, with current stocking levels very high. During a site inspection with ACLD and LLCC staff, it was recommended that this plantation be turned into a demonstration area for three levels of red pine thinning. One portion of this area should be thinned to an optimum stocking for increasing growth of the red pine. One portion should be thinned to increase biodiversity in the understory. And one area should be left un-thinned to observe natural changes in planting sites.

Black Spruce: (#13/3; 13/5; 14/8; 14/9)

This area is currently listed as type 13/3 BSL12 and 13/5 BSL 41. It contains a black spruce and tamarack bog with a variety of size and age classes. Since this area represents one of the highlight features of the Center, the board walk should be maintained in a level and safe condition. Recommendations include replacement of rotting portions of the walkway and maintenance to improve general public and student access for those with mobility handicaps. In addition, it may be necessary to protect certain areas of the bog near the walkway from habitat degradation due to overuse. Railings and signs are two possible suggestions for maintaining bog health by limiting human compaction.

Roadway:

Currently this is a public roadway which provides access to a number of lakeshore cabins to the east of LLCC property. There are concerns about the safety of the children due to increases in the level of traffic and the speed of motorized travel, especially during times of high student activity in this area. Recommendations for this area are to continue to explore methods to reduce traffic levels. Options may include providing alternative access for cabin owners, posting and enforcing strict speed limits, and maintaining newly placed speed bumps for oversized vehicles. This plan suggests that the decision making for these alternatives involve a transparent public process.

LEARNING AREA SOUTH:

Type: LAS

Acres: 66

**Inventory # : 14/3; 14/12; 14/13; 14/14; 14/16; 14/17; 14/18
Part of 13/33; 13/35**

Type descriptions:

This area is located south of the main campus and contains aspen and birch cover types of a variety of age classes, along with mixed hardwoods, oak, and a small residual stand of legacy red pine. Many recreational trails occur in the area.

In the late 1970's approximately 10 small patches for wildlife openings were created in Section 14 of this area. These patches have also served as locations for a variety of outdoor classroom activities. More recently, fuel wood thinning harvests have occurred on the eastern portion of this site.

Important educational activities which occur in this area include the orienteering course, and both the Thicket and Alpha Wolf classes.

Management Objectives & Desired Future Conditions:

<u>Legacy Red Pine:</u>	Retain as High Conservation Value Area
<u>Birch & NH</u>	Reserve for classes in orienteering and thickets. Potential demonstration area for crop tree release.
<u>Trails:</u>	Improve for better ski trails and public access
<u>Oak:</u>	Prioritize white pine management zones.
<u>Mature Aspen:</u>	(14/12) Actively manage for classroom habitat (thicket class) (14/18) Perform forest stand improvements for hardwoods.

Recommendations:

Legacy Red Pine: (#14/13)

Acres: 2

This is a small patch of approximately 1-2 acres in the southwestern corner of the LLCC property. It contains large diameter red pines with estimated ages of approximately 90-100 years. Since this is one of the only areas on LLCC with large diameter older pines, the principal recommendation is to manage this area as a High Conservation Value Area (HCVF).

An additional recommendation is to improve the trail access from the north and to maintain the trails for public non-motorized recreational use such as hiking and cross country skiing.

Birch &

Northern Hardwoods: (#14/14; 14/3)

Acres: 22

The sapling birch stand was part of the earlier management to create wildlife openings at the Center. Both it and the northern hardwoods are heavily used for educational activities, including the Thicket class and Alpha Wolf classes. We recommend reserving this area for current uses.

One option for management in this area would be to conduct demonstration crop tree release thinning. This would provide students with the opportunity to see and experience the benefits of forest stand improvement projects in native hardwoods.

Trails:

This area of the forest contains many woodland trails. Most of these are used by staff and students throughout the school year. There is the potential to expand the trail system to connect with the access road into the center. This would provide additional recreational opportunities for the public while maintaining the privacy and safety of the main campus.

One trail that has been proposed would tie into the existing trail in the legacy red pine stand and travel north to the access road. This trail would be used for non-motorized recreational activities, and would also require a small parking lot to be constructed near the entrance to the Center property.

Aspen:

(#14/12; 14/16; 14/17; 14/18; 13/35)

Acres: 12

There are a number of aspen cover types in this area. Three of them (14/16;14/17;13/35) are small sapling stands which result from earlier management to increase stand age class diversity for wildlife habitat. There are also two mature aspen types (14/12; 14/18).

Since this area is the focus of many classroom educational activities, management should prioritize educational opportunities. We recommend reserving the sapling-

pole timber areas for the present time. At least one of the mature aspen stands could be harvested to provide additional demonstration area for the Thicket Class and for age class diversity.

Oak:

(Part of #13/33)

Acres: 30

This area is currently part of a larger type (13/33) which extends along the Ridge between Long Lake and the Tamarack lowlands to the south. The recommendation is to split this portion of the oak type (which lays to the south of the campus and is used for educational activities) and include it as part of this new learning area for management purposes.

There are two high priorities for this area. One is to provide habitat for the outdoor classroom activities, including Wilderness Meal, Orienteering and the Alpha Wolf classes. The other is to begin white pine restoration to bring young white pine back to an area where they were once common. These management priorities are not mutually exclusive, however, active management in this area should be informed and coordinated between the Center and forestry personnel for ACLD.

The first step in this process will be to locate and ribbon potential high priority white pine management areas. With consultation from LLCC, final sites may be selected which do not impair current educational efforts. In the long run, the white pine management areas will provide additional demonstration sites for visitors and students, as well as help restore white pine to its ecological niche in the local landscape.

Photograph of current oak type

LEARNING AREA WEST:

Type: LAW

Acres: 53

Inventory # : 14/4; 14/6; 14/7; 14/10; 14/11; 14/15; 14/19;

Type descriptions:

This area is located west of the main campus and contains aspen and oak upland cover types and ash, tamarack and black spruce lowlands. The uplands contain many mixed hardwoods along the aspen and oak(?), with birch and maple the most common. The access road and recreational trails cross the area.

Management Objectives & Desired Future Conditions:

<u>Trails:</u>	Maintain and improve trails for recreation and education.
<u>Oak:</u>	Reserve for classroom area and update inventory.
<u>Aspen & Birch</u>	Conduct demonstration harvests for regeneration.
	Protect and reserve areas on trails or near wetlands.
<u>Lowland Conifers:</u>	Reserve for wildlife habitat and protection of nearby Lakeshore.

Recommendations:

Trails:

There are currently more than four miles of trails at LLCC. Two of these trails are all weather roads which are used by motorized traffic. The remainder of the trails is for non-motorized use only.

Some of the non-motorized trails are in need of maintenance and repair. In particular, the bog-walk has an unsafe surface in a number of spots, and repair of the wooden walkway should be a high priority. Repair of the bog walk should also take into consideration whether expansion of the current surface is appropriate or cost effective. There is some concern that levels of student traffic may be affecting the quality of the bog habitat. As a result, it may be necessary to limit foot traffic in certain areas to the walkway itself, and to place low railings on portions of the walkway.

In addition, a few of the walking trails near campus are muddy and slippery following rain events. These trails could be improved with gravel or a wood chip surface and with improved drainage.

Trails (cont)**Type: LAW**

Finally, there is an interest in expanding the current ski trail system. One proposed expansion would link the trails in Learning area South with a new parking lot near the entrance to the center. Another proposal would expand winter grooming from the current one trail to two trails. The addition trail would require an upgrade prior to grooming. Signage would also be recommended for the ski trails.

Oak:**(#14/15)****Acres: 10**

This area of oak and mixed hardwoods is directly west of the campus. While red oak is the dominant species, aspen, birch and red maple are also common canopy trees. The understory is variable with hazel, ironwood and maple saplings. Common buckthorn has been spotted near the roadway.

Since this area is close to the campus and is used for a variety of field classes, we recommend reserving the area from intensive management at this time. An activity which is recommended is removal of the invasive buckthorn before it becomes more widespread in the area.

Aspen:**(#14/6; 14/11; 14/19)****Acres: 33**

These three aspen cover types contain a significant component of mature and very mature, declining aspen. Paper birch is also very common, and certain inclusions are almost pure birch.

While the area is part of the learning area, it may be feasible to set up a number of small “patch cuts” of aspen and birch. These could serve as demonstrations of even-age management and could also improve wildlife habitat for species such as ruffed grouse. Finally, these harvests may be designed to assist in expanding the “Thicket class” habitat in the future.

Any harvesting activities should be closely coordinated between ACLD foresters and LLCC personnel.

Another option in this area would be to include a portion of the type in white pine restoration efforts. It appears that this is a fire dependent habitat and one possible treatment would involve white pine underplanting with the construction of a “deer enclosure” fencing near the loop trail. This would provide an educational demonstration near the campus of deer management to restore native habitat.

Lowland Areas: (#14/4;14/7; 14/10)

Acres: 10

These are two lowland areas which are situated between the upland ridges and near the east end of Jenkins Lake. Tamarack, black spruce, black ash, and lowland shrubs including alder and willow are present.

These areas should be reserved and protected. Minnesota Site Level Guidelines note that riparian areas are “among the most important parts of forest ecosystems”. Protections of water quality and wildlife habitat are two of the primary benefits these areas provide.

* * *

(Photographs of bogwalk area and lowlands)

COVER TYPES ON THE REMAINDER OF THE CENTER

OAK & MIXED HARDWOODS

Acres: 108

Type: #13/33; 13/37; 13/39; 13/40; 13/41; 13/42; 13/43; 13/44

Age: 80-90 years
Stocking: Medium: Basal area 70-100
Site Quality: Fair (SI: 50- 55)
Size class: Small sawtimber: (11-15")
Health: Mortality and windthrow present
Volumes: 15-20 cds/acre

Type Description:

This area consists of several upland types is located south of Long Lake along a glacial moraine between two lowland areas. Red oak is the dominant overstory species in this area. Other canopy trees include red maple, paper birch, basswood, green ash, and scattered super-canopy white and red pines.

The understory is highly variable. Common understory species include red maple, hazel and ironwood. Stocking levels vary, depending upon past disturbance regimes. It appears that white pine were more common on this type in the past and fire has also had an impact on the regeneration in the area..

A woodland trail and a couple of walking trails cross the type from east to west which can be maintained for continued non-motorized use.

Desired Future Condition:

Maintain the oak cover type and increase the white pine component

Recommendations:

One of the highest priorities for LLCC and ACLD is to create white pine demonstration areas. The design and location of the restoration sites has yet to be determined, however, it is likely that this type will be split into multiple types once future management priorities and sites are identified. Therefore, one recommendation is to establish the locations and treatment prescriptions for white pine within this type.

(cont)

Oak (#13/33) cont.

Another recommendation, given the proximity of this area to the learning areas, is to maintain or improve the trail system in this area for recreational and educational purposes. Trail signs could help skiers or other parties to follow the trails, and it may be feasible to design and construct additional trails in the area.

ACLD has also begun a series of small woodland improvement harvests in portions of this type south of the woodland trail. These harvests open the canopy for regeneration, provide fuelwood for the center, and also provide a diversity of forest stand age classes for wildlife and management purposes. Recommendations would be to continue these small scale improvement operations, giving special attention to the potential for white pine release or shelterwood regeneration for the red oak. Shelterwood is a system widely employed in Europe to regenerate oak species. Good seed trees are selected and retained in the canopy.

In a good acorn crop year, the soils underneath the oaks should then be scarified or treated with herbicides. This will provide a seedbed and sufficient light for the oaks to regenerate. Ironwood would need to be removed or treated at this time. The landowner may also choose to supplement the natural regeneration of oak with planting, depending upon stocking levels.

A shelterwood harvest removes the other species and opens up the site to light. Scarification provides a seedbed for oak regeneration. Once the oaks are breast height, the residual oaks are removed from the site.

Another option is to permit this area to continue to slowly mature. If this occurs, the red oak component will slowly decrease as mortality takes place. Red maple and bur oak will become more important species in the canopy, and eventually the area will convert to these species. Without active management, the landowner will slowly lose the oak overstory and the benefits it produces.

Small photograph of oak type woodlands

RED PINE

Types: #13/32 & Inclusion

Acres: 2

Age: 90-95
Site Index: From inventory: 56
Stocking: Basal area from inventory: 103 Sq. Ft.
Size class: Sawtimber
Health: Generally good vigor
Volume: 6-12 MBF / acre

Type description:

These are two small areas on the eastern side of the Center with high quality ninety year old stands of red pine. One site is accessible from the south trail, and the other site is on the east end of Long Lake.

Desired Future Condition:

Reserve for future high conservation value forest (HCVF)

Recommendations:

With a goal of restoring more mature pine to the Center, these two areas provide baseline opportunities for high conservation value forests. Both areas have significant aesthetic appeal in addition to their uncommon status as mature pine types. Manage to retain both types.

Another option for these areas is to consider periodic thinning operations to encourage growth of the large pines. Silvicultural treatments would remove competing species such as aspen, and other short lived hardwoods, along with pines of poor form and growth. Thinning would also lower the fire hazard and improve the appearance of the remaining type.

A final option for this type is to improve access to the stand that lays at the east end of Long Lake.

MATURE ASPEN

Types: #13/25; 13/28; 13/34;

Acres: 63

Age: 50-75
Stocking: Medium (basal area 75-100)
Site Index: Good (70-78)
Volumes: 12-20 cds /acre
Health: Aspen has Hypoxylon infections

Type description:

These are three aspen cover types located on the southern part of the center property. All three contain mature and very mature, declining aspen along with smaller amounts of northern hardwoods. Access to two of the sites (13/25 & 13/34) is restricted to the frozen season due to wetlands.

Desired Future Condition:

Regenerate to even-age aspen type retaining hardwood component.

Recommendations:

These areas are among the most remote on the center. Recommendations are to conduct traditional even-age management for aspen, reserving high wildlife value species such as bur oak and conifers.

Harvesting activities should be restricted to winter months due to the large wetland areas and for access. In addition, it will be important to follow site level guidelines with regard to buffer strips, filter strips, and coarse woody debris for wildlife (such as large drumming logs for grouse).

The design of the logging trails should take into consideration future uses for recreational activities, such as cross-country skiing.

One management option would also be to reserve the portion of the type which contains the greatest diversity of hardwoods from recent harvest and to use this area as a demonstration area for aspen succession to hardwoods.

REGENERATING ASPEN

Types: # 13/27; 13/29; 13/36;

Acres: 46

Age: 5-30
Stocking: Good
Site Index: Good (64-75)
Volumes: Premerchantable
Health: Good

Type description:

These are three aspen cover types in various stages of regeneration following disturbances. Quaking aspen is the dominant species in these types. However, in one type birch is also present in significant numbers where birch regenerated after the site was used as a firebreak. (#13/29).

Desired Future Condition:

Manage for aspen forest products, reserving areas in riparian areas.

Recommendations:

These are productive sites for aspen and the regeneration is adequate to good on all three sites. The priority option for management is to grow the aspen to maturity (45-60 years) while reserving riparian areas. Area 13/36 should be field checked in ten years to determine whether an aspen thinning harvest would be appropriate. Thinning aspen is a relatively new management option which produces early income, helps increase growth, may extend the rotation age of the residual stand, and opens the stand which may encourage greater stand plant diversity. Thinning is not viable in all aspen types due to operability and disease constraints.

Area 13/29, which is located in a riparian area between the lowland conifers on the northern ridge, may be candidate for reserving from intensive forest management. This area should be field checked in five years.

These sapling stands also provide excellent nesting cover for a variety of woodland species including grouse and many songbirds.

OAK & Hardwoods

Types: #13/8; 13/14; 13/17; 13/31

Acres: 46

Age: 70-80
Stocking: Medium: Basal area 75-110
Site Quality: Fair (SI: 55- 60)
Size class: Small sawtimber: (11-15")
Health: Mortality and windthrow present
Volumes: 10-20 cds/acre

Type Description:

These oak and hardwood types occur on the northern upland ridge to the east of campus. Red oak is the dominant overstory species with aspen, bur oak, red maple and paper birch also common. The red oak appears to have a higher site quality than in type 13/33, which may be due to the north facing slopes in the area or to a change in soil conditions along the edge of the moraine.

The understory is highly variable. Common understory species include sugar maple and hazel. Stocking levels vary, depending upon past disturbance regimes.

Access is good via the main east-west, year-round road on the Center.

Desired Future Condition:

Maintain the oak cover type for high quality products and wildlife mast.

Recommendations:

This area is not a high priority area for management at this time. The most pressing concern in this area is the current use of the road by cabin owners to the east. Due to high traffic levels, and concerns with children in the field, LLCC should explore other options for neighbor access on the east side of the center.

There are opportunities in the future for shelterwood oak regeneration management in this area. A shelterwood harvest removes the other species and opens up the site to light. Scarification provides a seedbed for oak regeneration. Once the oaks are breast height, the residual oaks are removed from the site.

Another option is to permit this area to continue to slowly mature. If this occurs, the red oak component will slowly decrease as mortality takes place. Red maple and bur oak will become more important species in the canopy, and eventually the area will succeed to these species. Without active management, the landowner will slowly lose the oak overstory and the benefits it produces.

TAMARACK: **Types: # 13/1; 13/2; 13/13; 13/20; 13/22; 13/23; 14/2** **Acres: 71**

Age: Uneven aged
Site Index: 20-50 (Tamarack)
Stocking: Variable
Size class: 2-9". Sapling-poletimber
Health:
Volume: 1-10 CDs / acre

Type description:

These are a series of uneven aged tamaracks stands, the largest of which is located south of the oak moraine. The ages and stocking of these types varies from stagnant tamarack in the northern border area, to better quality tamarack in types 22 and 23.

The understory contains black spruce with a components of alder, dogwood and wetland sedges.

Desired Future Condition:

Maintain the tamarack for water quality and begin to manage the better sites.

Recommendations:

This lowland conifer type serves as an important hydrological filter. The type traps and filters sediments and nutrients flowing through the adjacent stream system. This provides cleaner water for the Long Lake and the downstream watersheds.

A seed tree wood sale has been set up in type 13/22. The trees to be removed have been marked. This sale would be harvested in the winter months and would be sold for "local use", including fuelwood for the center.

The areas should also be monitored for high or low water levels and for the presence of any tamarack dieback.

RIPARIAN FOREST**Types: #13/12; 13/18; 13/37****Acres: 33****Type description:**

These three inventory types adjoin the Long Lake water basin and the large tamarack wetland south of the oak ridge. Two of the areas are typed as muskegs (13/12; 13/18) and the third as an aspen type (13/37). All of them function as riparian areas between the highland moraine and lowland or water basins.

Desired Future Condition:

Retain for wildlife habitat, water quality protection and scenic beauty.

Recommendations:

Riparian forests exist in the interface between water bodies and upland forests. They are sensitive ecological zones, due primarily to their role in water filtration and to their important wildlife habitat.

This type provides recreational and aesthetic benefits to the LLCC. We recommend that this area be reserved from all forest management and that the corridor be protected from development, including trails. Beaver and many waterfowl are active in these areas.

Alternative:

Underplanting white pine seedlings may enhance the diversity of Type 13/37. To increase the likelihood of successful planting proper site preparation and planting in areas of low brush levels should be undertaken.

* * *

LONG LAKE:

Acres: 38

Recommendation:

Not enough information on lake. Would a naturalist like to write this section? (foresters don't know water very well)

BLACK SPRUCE:

Types: #13/4; 13/6; 13/7;

Acres: 40

Age: 35-55
Site Index: 20-40 (Black Spruce)
Stocking: Variable
Size class: 2- 9"
Health: Fair to good
Volume: 4-8 CDs / acre

Type description:

These are a series of black spruce stands located on the northern tier of the Center. Most black spruce stands in the Lake States originated after wildfires and so are, or once were, even-aged. In areas having no disturbance for a long period of time, these stands tend to become uneven-aged.

The understory contains black spruce with a component of tamarack, Labrador tea and other bog ephemeral plant species.

Desired Future Condition:

Manage for wildlife habitat, water quality protection and forest products.

Recommendations:

The usual objective in managing black spruce areas is to produce a sustained yield of pulpwood without adversely affecting water quality and wildlife habitat. In this area the manager recommends strip harvesting, once the spruce reach maturity, to regenerate black spruce.

Another option is to utilize at least a portion of the area for spruce tip harvests. Spruce tips are a growing niche market and one that represents a valuable use of the resource.

A final option is to reserve portions of the area from active management.

LOWLAND BRUSH & Grasses: Types: #13/24; 13/26; 13/21; 14/1

Acres: 96

Type description:

These are a series of wetland areas where the soils are organic and are saturated all year.

The most common species are alder and willow, with scattered tamarack, birch and spruce. A portion of type 13/26 is primarily in wetland sedges.

Management Objective: Reserve for wildlife habitat, water quality and scenic beauty.

Stewardship Recommendations:

The most important consideration for this type is to maintain it. Wetland areas are very important as habitat for wildlife and as filter systems. Wetland plants absorb nutrients from non-point source pollution. This means cleaner water leaving the watershed.

Wetland areas provide important habitat for a number of wildlife species, including insects, amphibians, songbirds, and waterfowl. Furbearers such as mink and raccoon and other predators like fox will also utilize the wetlands for foraging.

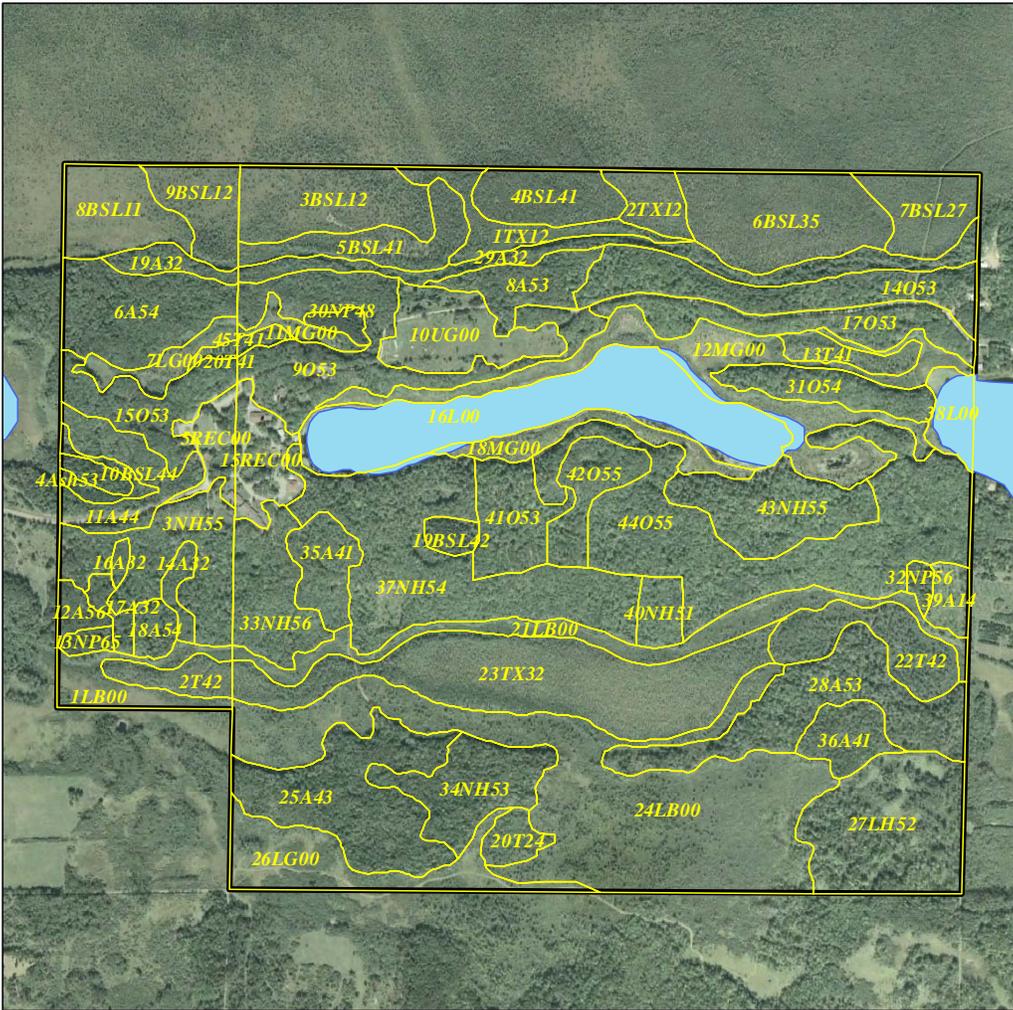
Among birds found in riparian zones are the barred-owl, great blue heron, broad-winged hawk, spotted sandpiper, pileated woodpecker, belted kingfisher, red-shouldered hawk, wood duck, common goldeneye and hooded merganser. Typical mammals are the black bear, fisher, otter, mink, beaver, and raccoon.

In addition, wetlands adjacent to river systems can serve to augment low flows, reducing negative impacts of short term precipitation deficiencies in rivers.

Plan Implementation:

Based on the recommendations contained in this plan, we have prioritized the following implementation activities for the Center.

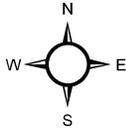
<u>Activity</u>	<u>Time Line</u>	<u>Personnel</u>
Complete an updated inventory with new mapping units for LLCC	Winter 2005/6	Forester and Inventory Specialist
Begin to resolve road access issues with neighborhood property owners	Summer 2006	ACLD & LLCC Staff
Mark pole red pine for thinning And set aside demonstrations.	Fall/Winter 2006	Forester
Remove all hazard trees from LLCC Campus	2006	LLCC Staff & Contractor
Design public trails for improved Recreational activities	Spring/Summer 2006	ACLD & LLCC Staff
Thin red pine plantings.	Winter 2006-07	Forester/Logger
Design and Site Prep areas for Additional white pine restoration	2006-07	Asst. Land Commissioner & Forester
Set up harvest for aspen thicket Learning area.	Fall 2006	Forester
Rehabilitate Bog walk boardwalk	Spring 2006	LLCC & Contractor
Prescribed burning of Learning area For Woodcock habitat	Ongoing	Foresters & Trained Staff
Conduct forest management And naturalist classes for adults	Ongoing	LLCC and ACLD Staff
Implement ECS classification & Training for all upland forests at LLCC	Summer 2007	Staff & Outside Experts
Forest Stand Improvement Thinning In designated hardwood areas	Ongoing	Forester & Loggers
Woodland & Learning Center Trail Improvements	Ongoing	LLCC & Contractor
Resolution of road access for neighbors (includes possible new road construction)	Summer 2008	Staff & Contractors
Implement white pine restoration areas	Ongoing	Staff & Contractors.

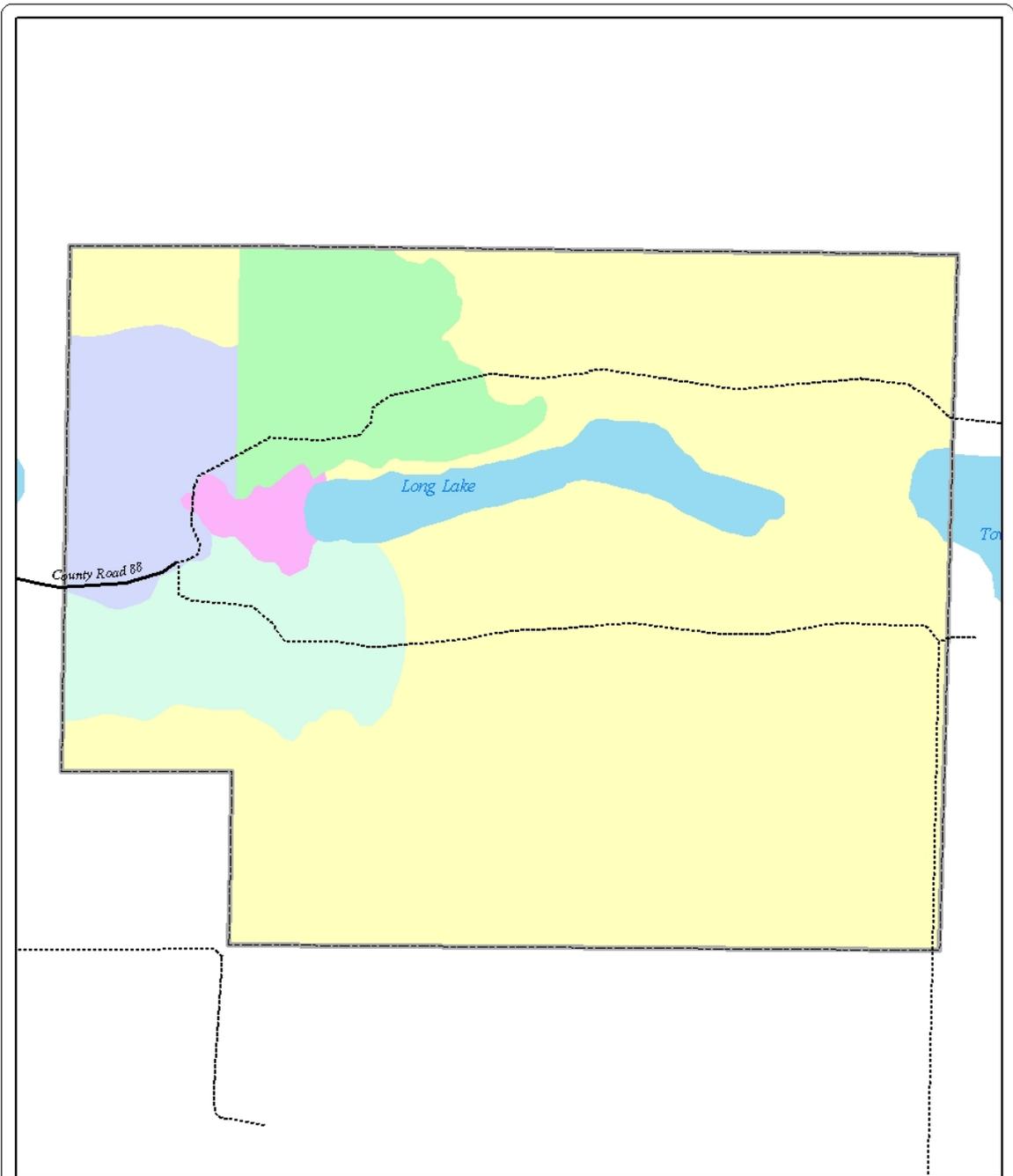


Legend

- Forest Stand
- Lake
- LLCC Boundary

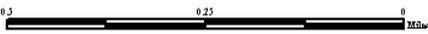
**Long Lake Conservation Center
Aitkin County, MN**



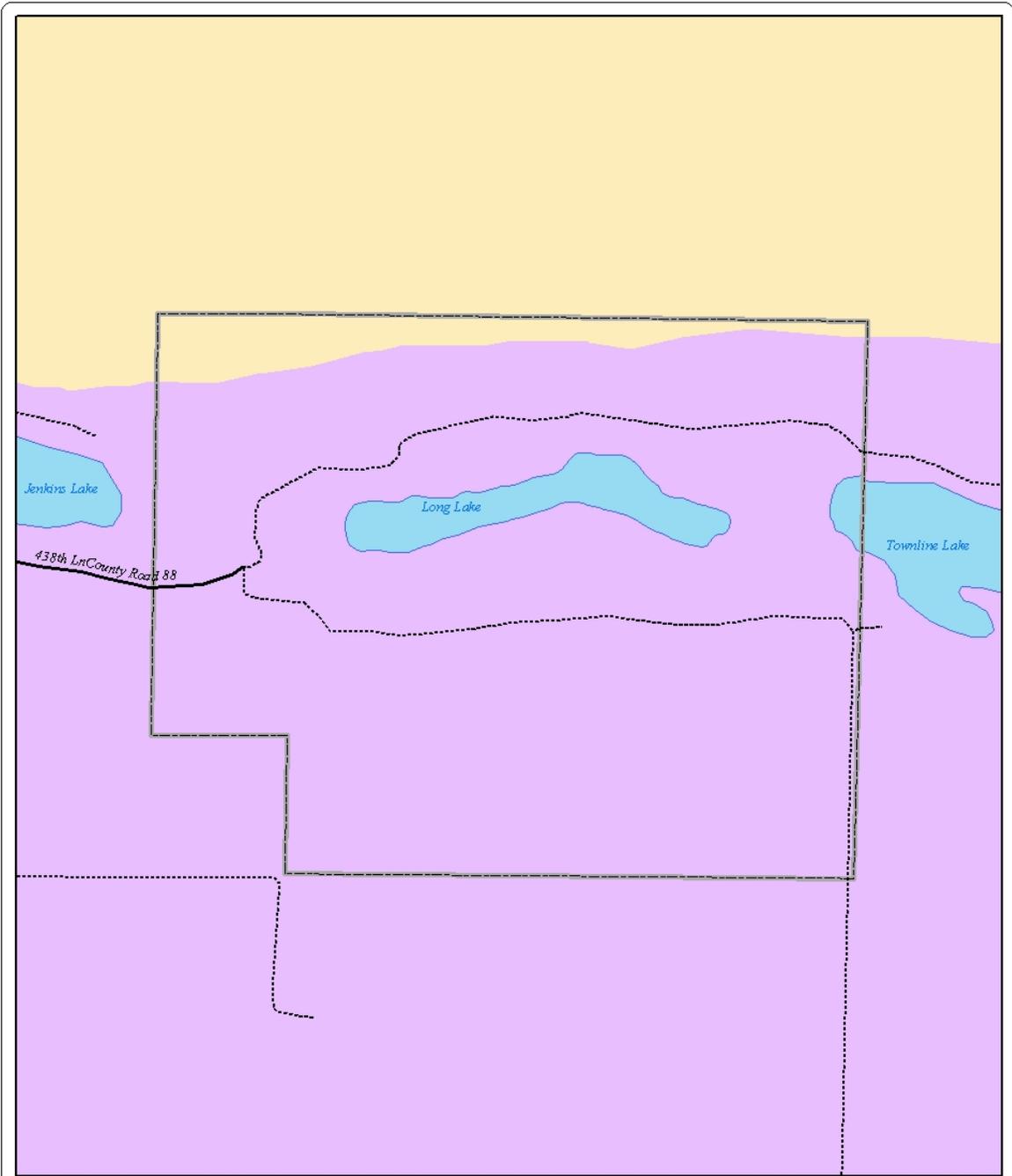


Legend	
— County Road	LAND_USE
- - - Other Road	Learning Area North
▭ LLCC Boundary	Campus
▭ Lake	Learning Area South
	Forest Mgt. Demo Area
	Learning Area West
	Long Lake

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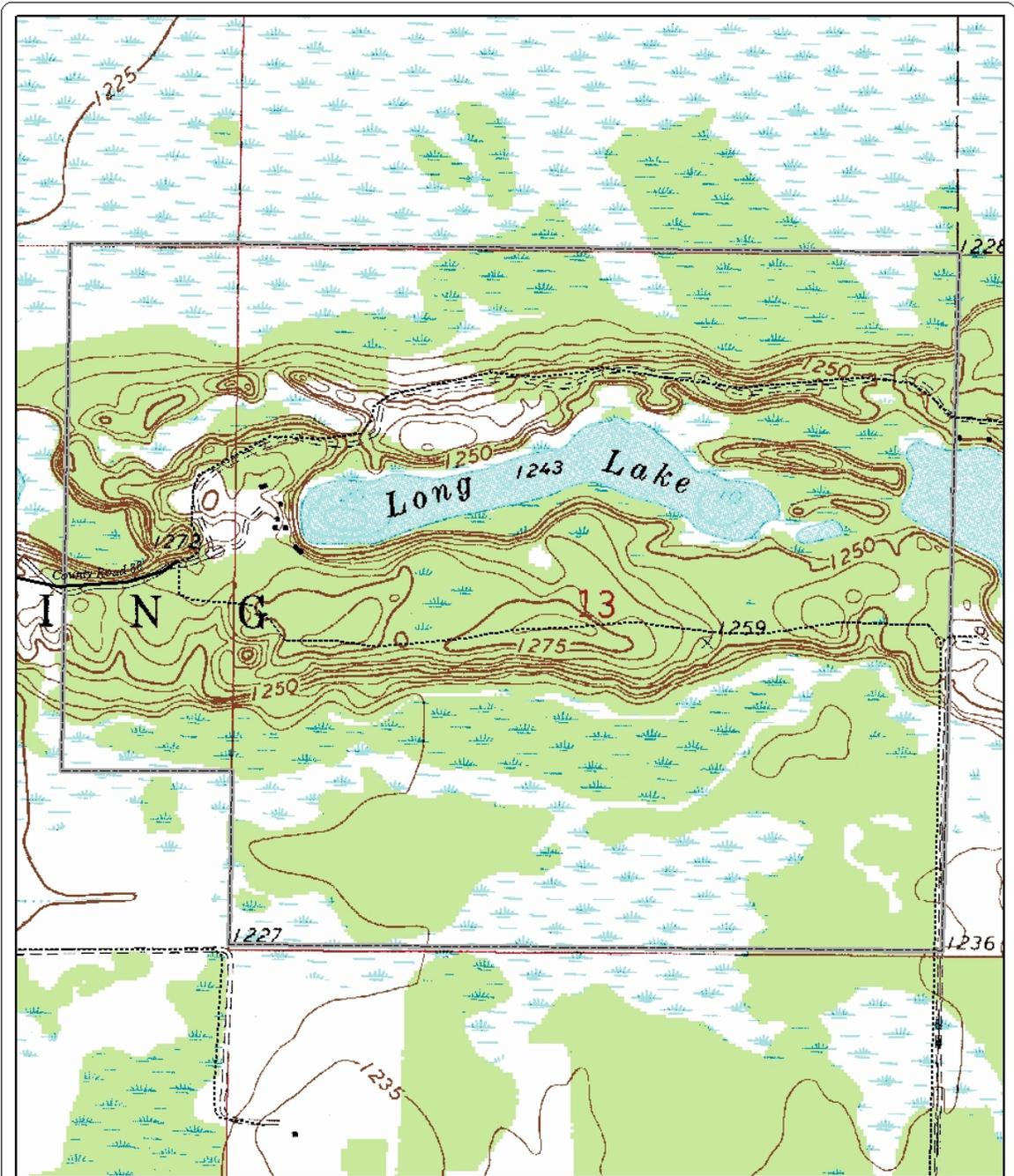
Legend	
	County Road
	Other Road
	LLCC Boundary
	Lake
	LTA St. Louis Moraines
	Tamarack Lowlands

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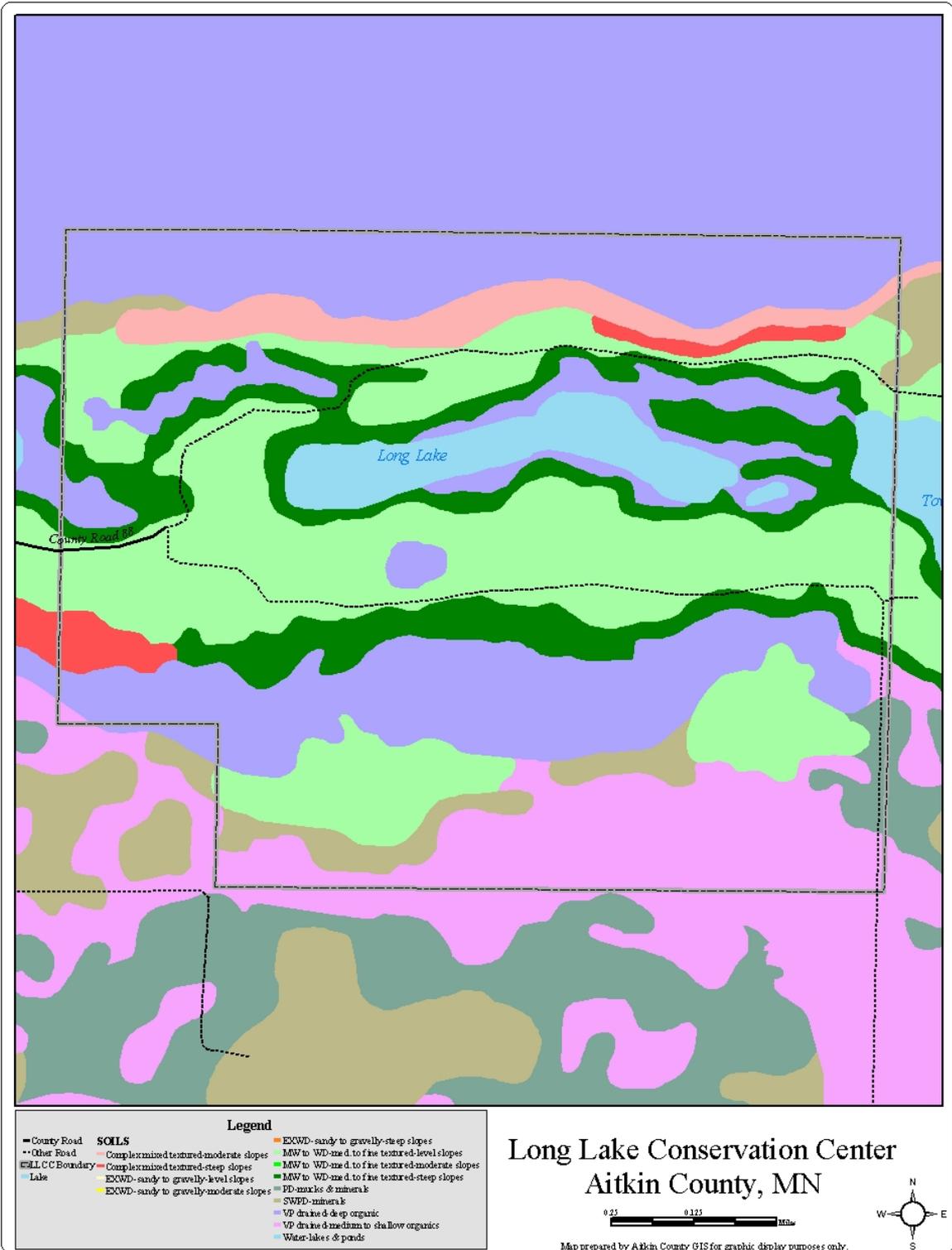
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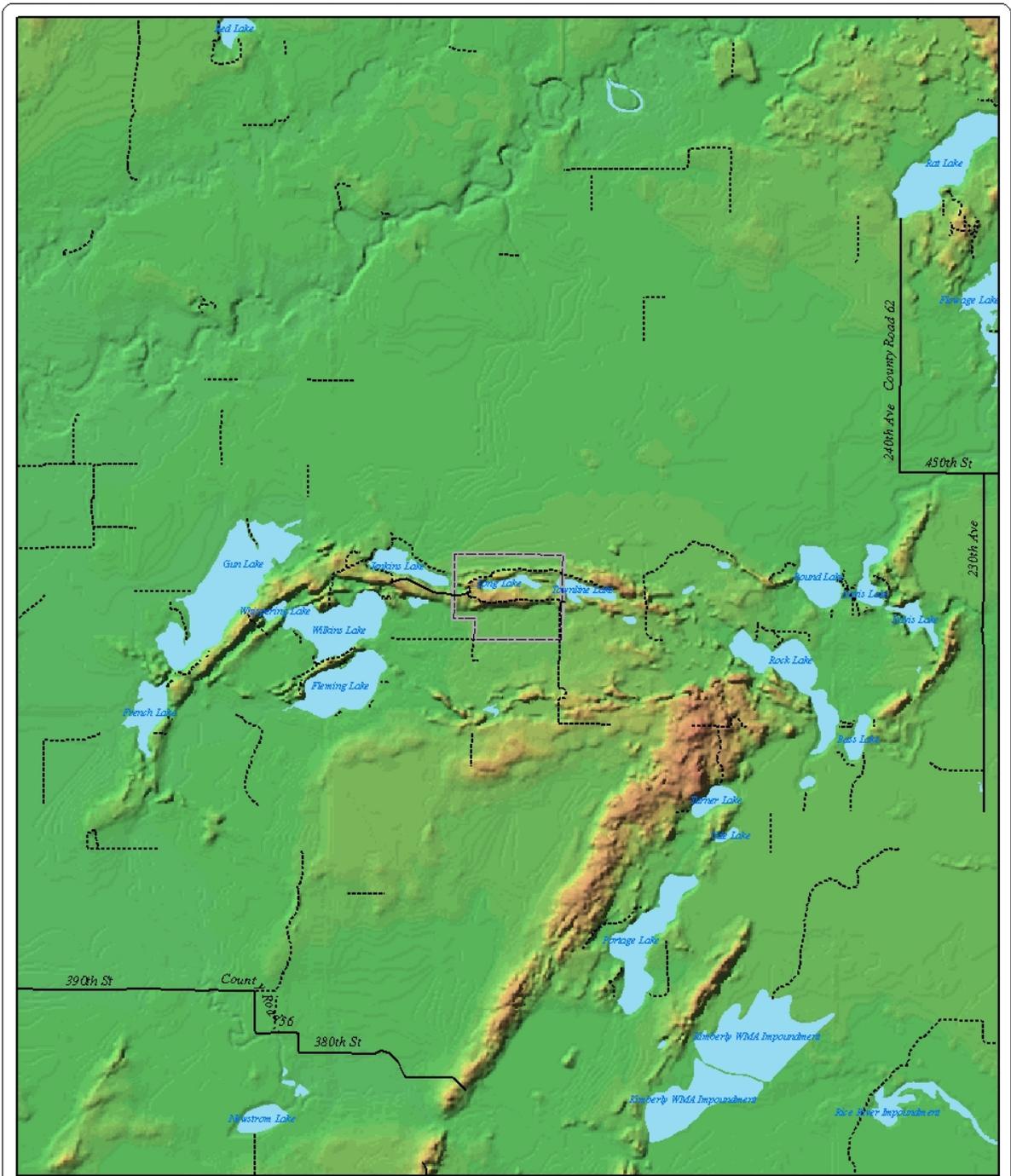
- County Road
- Other Road
- LLCC Boundary

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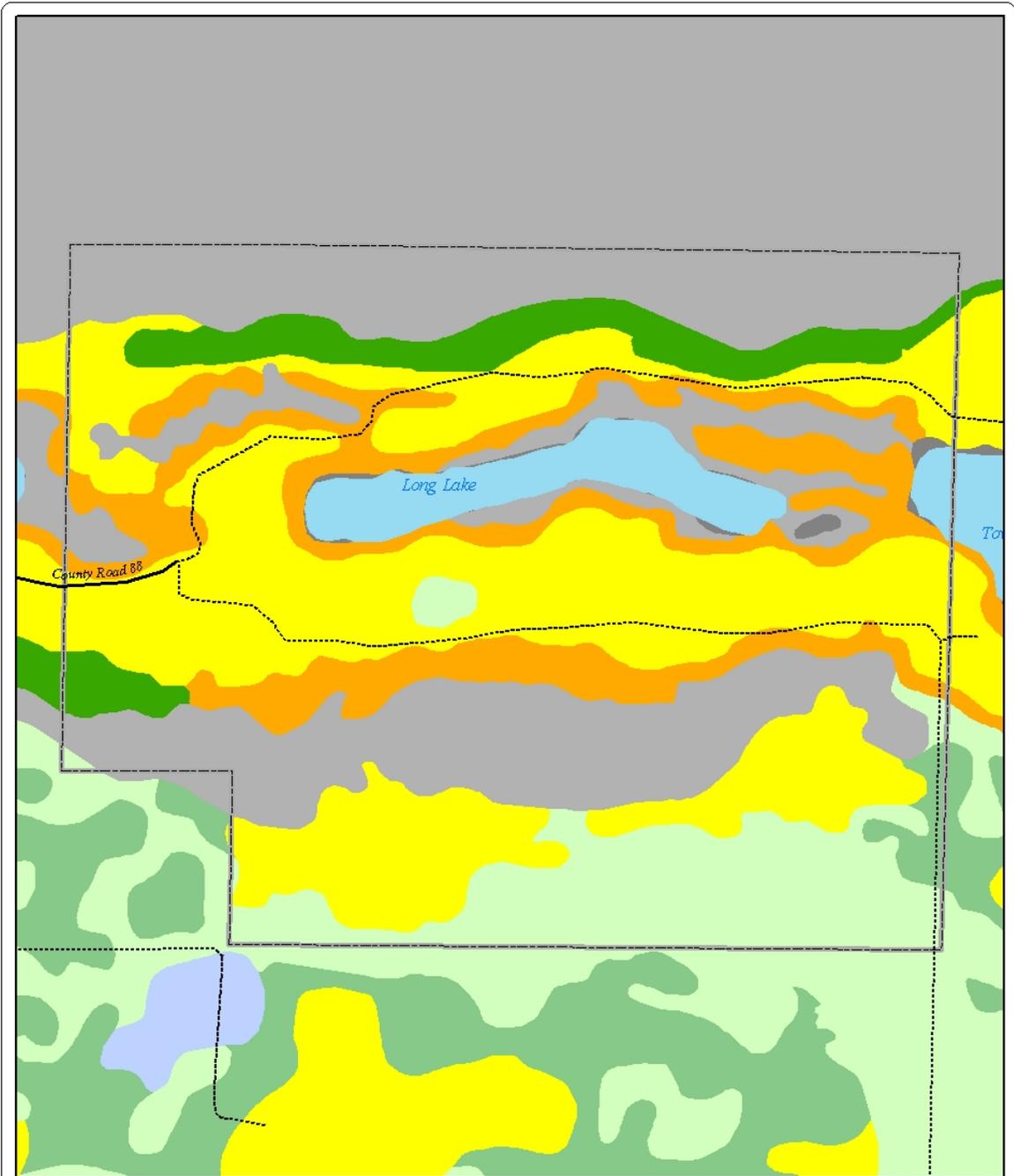
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Legend

- County Road
- - - Other Road
- LLCC Boundary
- Lake

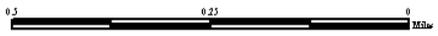


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Legend	
— County Road	FES
- - - Other Road	Not Classified
⌈⌋ LLC Boundary	Dry Mesic-Hwd/Conifer
⬢ Lake	Dry Mesic-Conifer
	Mesic-Mixed Hwd
	Mesic-Northern Hwd
	Wet Mesic-Boreal Hwd/Conifer
	Wet Mesic-Lowland Hwd
	Wet Mesic-Hwd
	Organic-Hwd Conifer
	Organic-Lowland Conifer

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