

# **The Natural Values of the Echo Lake Tract**

## **Prepared by Dean and Kent Premo, White Water Associates**

The Echo Lake tract, including Echo Lake, Harlow Creek headwaters, Little Garlic River headwaters, Little Garlic Pond, and several high rock pocket ponds and the 480 acres of surrounding land owned by Ray Johnson, is a beautiful and biologically rich tract located just minutes from the Upper Peninsula's largest city, Marquette. The great biological diversity, recreational value, and natural beauty are based on a broad assemblage of natural features combined with "value-added" projects that Mr. Johnson has instituted on the tract.

### **Natural Features**

The central focus of the tract is Echo Lake. This twenty-five acre lake is surrounded by a landscape of dramatic relief with high bluffs of exposed bedrock. A shear wall of rock juts out of the southwest arm of the lake and gives the impression of a deep canyon. The riparian forest that surrounds the lake is mixed deciduous and conifer and includes some large trees that miraculously cling to rock outcrop. The shoreline contour is relatively complex with bays and points and is slightly more than one mile in length. There is good quantity of large woody material (logs and trees) in the lake forming excellent fish cover. Rock and rooted aquatic vegetation form other high quality fish habitat features.

Echo Lake has characteristics of both oligotrophic and mesotrophic lakes, but is low in nutrients and therefore free from algal blooms and nuisance vegetation. No invasive aquatic species have been identified in the lake. Echo Lake has a very good depth structure and runs off from shore quickly in most parts of the lake. Maximum depth approaches or exceeds fifty feet. There is a good population of largemouth bass and bluegills with some large individual fish. Echo Lake is quite clear and allows fairly deep sunlight penetration. This condition allows rooted vegetation in fairly deep water and results in good fish habitat.

In addition to Echo Lake, this tract has several other water features that have great biological value and add significantly to the natural beauty of the area. About one-half

mile south and west of the Echo Lake is a large pond that forms the headwaters of the south-most branch of the Little Garlic River (a high quality trout stream). This several acre pond is productive of aquatic vegetation and provides excellent habitat for a variety of water-dependant animals. It is surrounded by rock outcrop that is vegetated with oak and other hardwoods.

Harlow Creek has its headwaters on the Echo Lake tract. Harlow Creek flows west into Lake Superior and is scored as “excellent” quality as measured by the Michigan Department of Environmental Quality Rapid Bioassessment Protocol. This indicates it has a diverse and robust community of aquatic invertebrates (good fish food).

A unique water feature of the Echo Lake tract are three high rock ponds that appear to permanently hold water and support thriving aquatic ecosystems. These ponds are formed by large depressions in the bedrock that collect and hold water. Amphibians, birds, and mammals (including beaver) inhabit these wet oases that offer aquatic habitat in the otherwise harsh and dry rock outcrop.

The forests of the Echo Lake tract are diverse and old. There is a mix of hardwood stands (generally dominated by red oak and sugar maple) and conifer stands. Two areas of conifer offer unique attributes and wildlife values. One is a stand of very large and dense eastern hemlock. Stands of these trees are rare in the Upper Peninsula having been over-harvested in the past with subsequent poor regeneration. Hemlock trees provide crucial “thermal cover” for large mammals (white tailed deer and moose) in the harsh U.P. winters. Eastern hemlock is a species for which the Michigan Department of Natural Resources provides special management attention in an attempt to increase its distribution and abundance in the U.P. Given the deep snow and cold winters along Lake Superior, the presence of this large stand of hemlock on the Echo Lake tract has exceptional wildlife value.

The other exceptional conifer forest is a fifty-acre stand of very large northern white cedar. These provide some of the same wildlife values as eastern hemlock and are also an important browse species for white tailed deer. Several species of Neotropical migrant warblers (for example, the beautiful Blackburnian warbler) use this kind of cedar habitat for nesting. Both the hemlock and the cedar stands are old-growth ecosystems.

Echo Lake is within the riparian corridor of Lake Superior. Migrating birds move along the lakeshore and riparian corridor of the lake. The habitat provided by Echo Lake and its unique forest types and wetlands provide refuge and food for the spring and fall bird migrants.

Perhaps the most remarkable natural feature of the Echo Lake tract is its dramatic topography. From high points of the tract, Echo Lake is visible almost as if one were in a low flying plane. A bit further out in the viewscape of these highpoints is the sparkling water of Lake Superior. These vistas are well worth the effort exerted to climb to the peaks of the Echo Lake tract.

The great mix of ecosystems (lake, ponds, streams, conifer forest, hardwoods, open wetlands, and bare rock) provides myriad habitats for plants and animals. The previous landowner cataloged over one hundred plants, but this is likely less than twenty percent of the plant species present on the tract. Gray wolf sign was observed on a 2006 visit to the lake. Black bear, white tailed deer, coyote, red fox, bobcat, fisher, river otter, mink, beaver, and snowshoe hare are but a few of the other residents on this tract. Birds have not been studied on the site, but certainly will number well over one hundred species. Amphibians such as northern leopard frog, green frog, mink frog, spring peeper, gray tree frog, American toad, blue-spotted salamander, and spotted salamander all make use of the Echo Lake tract wetlands for breeding.

The large Echo Lake tract is surrounded by State of Michigan and extensive land owned by Forestland Group, LLC. These well-managed and relatively protected lands serve as a large buffer zone that protects and enhances the high quality of the Echo Lake tract. Collectively they represent a large unbroken landscape of high quality habitat for large and small animals.

### **Value Added to Natural Assets**

At the very beginning of Ray Johnson's tenure as owner of the Echo Lake tract, he engaged the services of a professional ecological consulting firm (White Water Associates) to assist in discovering and describing the natural assets described in the preceding section as well as recommending various "value added" projects that would complement and enhance the intrinsic value of the tract. Mr. Johnson also secured the

services of a professional forestry group (Cold Springs Forestry) for timber and forest habitat assessment and a top-notch heavy equipment operator (DZ Contracting) for roadwork and site restoration actions. Projects on the Echo Lake tract have been carried out in close collaboration between Mr. Johnson and White Water scientist, Dr. Dean Premo. In this section, we describe these projects.

The previous owner of the Echo Lake tract conducted limnological studies on Echo Lake to understand water chemistry, temperature and dissolved oxygen, algae, and aquatic plants. This work forms a valuable baseline data set for the lake. This kind of information is crucial to understand long-term health of the lake and is generally absent for most U.P. lakes. White Water Associates has conducted some follow up work on the lake and plans are in place for additional study of the fish, aquatic invertebrates, aquatic plants, and water chemistry.

One of the first projects under Mr. Johnson's ownership was restoration and improvement of the road system for the Echo Lake tract. This included careful installation of wetland crossings and stabilization of road banks. Annual rye and native plant seed was sewn on the road banks to ensure rapid vegetative stability. The road was stabilized to prevent erosion and protect downstream water quality.

Another restoration project undertaken on the Echo Lake tract was the removal of an old travel trailer and removal of the concrete pad on which this trailer was permanently parked. The trailer, trash, and impervious surface were removed from this lakeside site and the area was graded and topsoil added. Ground stabilizing annual rye and native seed was sewn to establish vegetation and prevent erosion into the lake. A nearby eroding bank that was historically used as a boat launch, was armored with protective crush rock, dusted with top soil, and planted with stabilizing plants in order to protect Echo Lake water quality.

Another large undertaking for the Echo Lake tract was a professional timber and forest habitat inventory that was carried out during September of 2007. The results from this work not only indicate timber value, but also allow mapping of major habitat types in the tract. This information will be valuable in future wildlife studies and management projects. Crucial microhabitats and monarch trees were also identified and mapped as part of the forest inventory.

Much of the restoration efforts and forest inventory data on the Echo Lake tract have been documented into a Geographic Information System (GIS) so that accurate maps of roads, trails, and forest types other features can be produced. This high tech application assists in the overall effort on the Echo Lake tract and adds great value to understanding, management, and enjoyment of the tract.

Ray Johnson has assumed a “Do No Harm” approach when it comes to management of the Echo Lake natural assets. He has proceeded with management projects only after information has been gathered and broad consideration given to likely outcomes (and unanticipated consequences) of any action on the land or water. His approach is to protect what is healthy and well functioning on the tract and restore any of those assets that have been degraded by human activity. This is an ongoing process with additional project on the planning board. Hiking and interpretive trails, lake and fisheries management, aquatic and terrestrial studies will soon be developed.

**Below:** Blueberry plant nestled amongst lichen on the Echo Lake tract.







**Top:** View looking west toward a point between the narrowing bays of Echo Lake.

**Bottom:** Sheer rock cliffs drop precipitously along a narrow canyon bay.







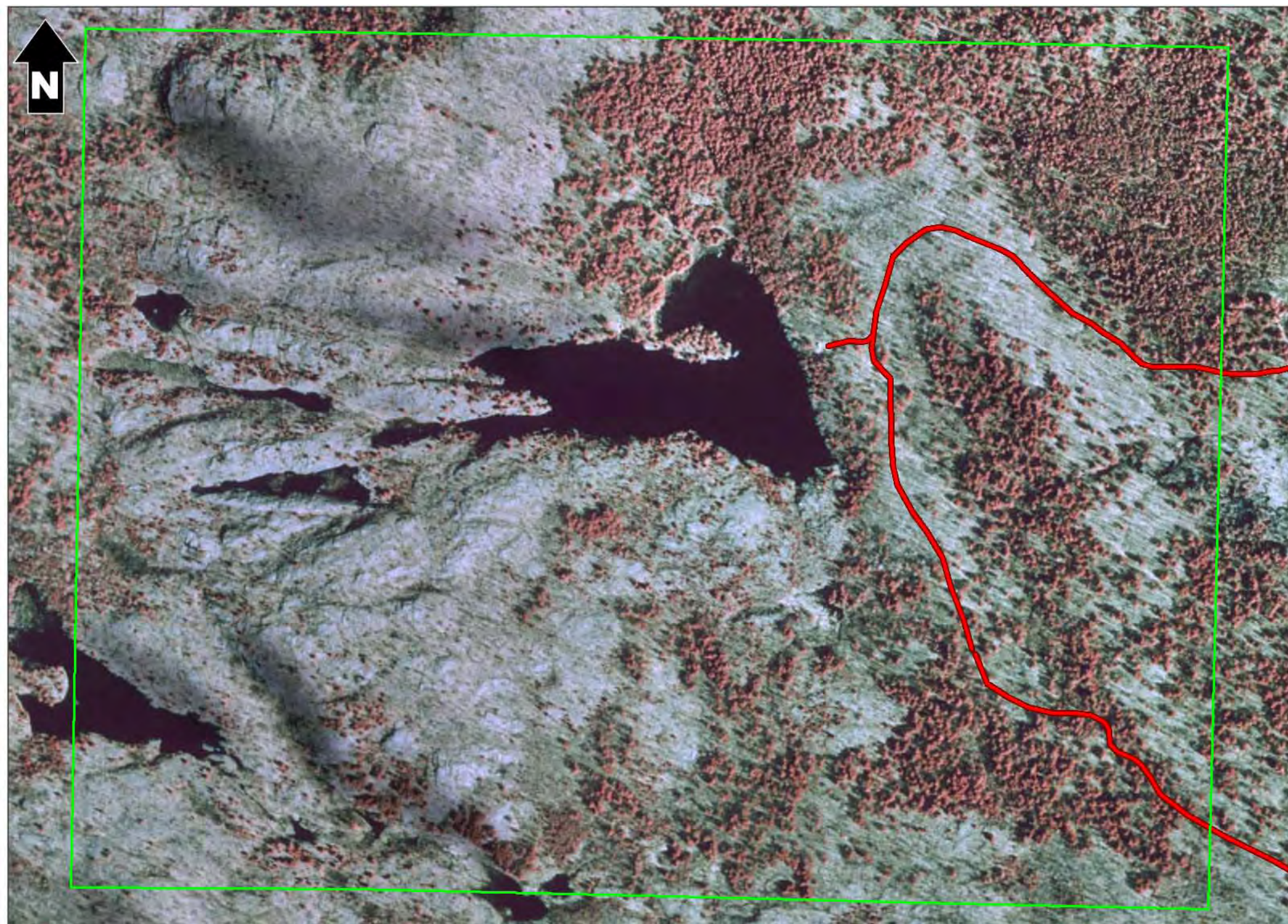
**Top:** View looking east from a high point at the main body of Echo Lake.

**Bottom:** The property's road banks have been stabilized through seeding.



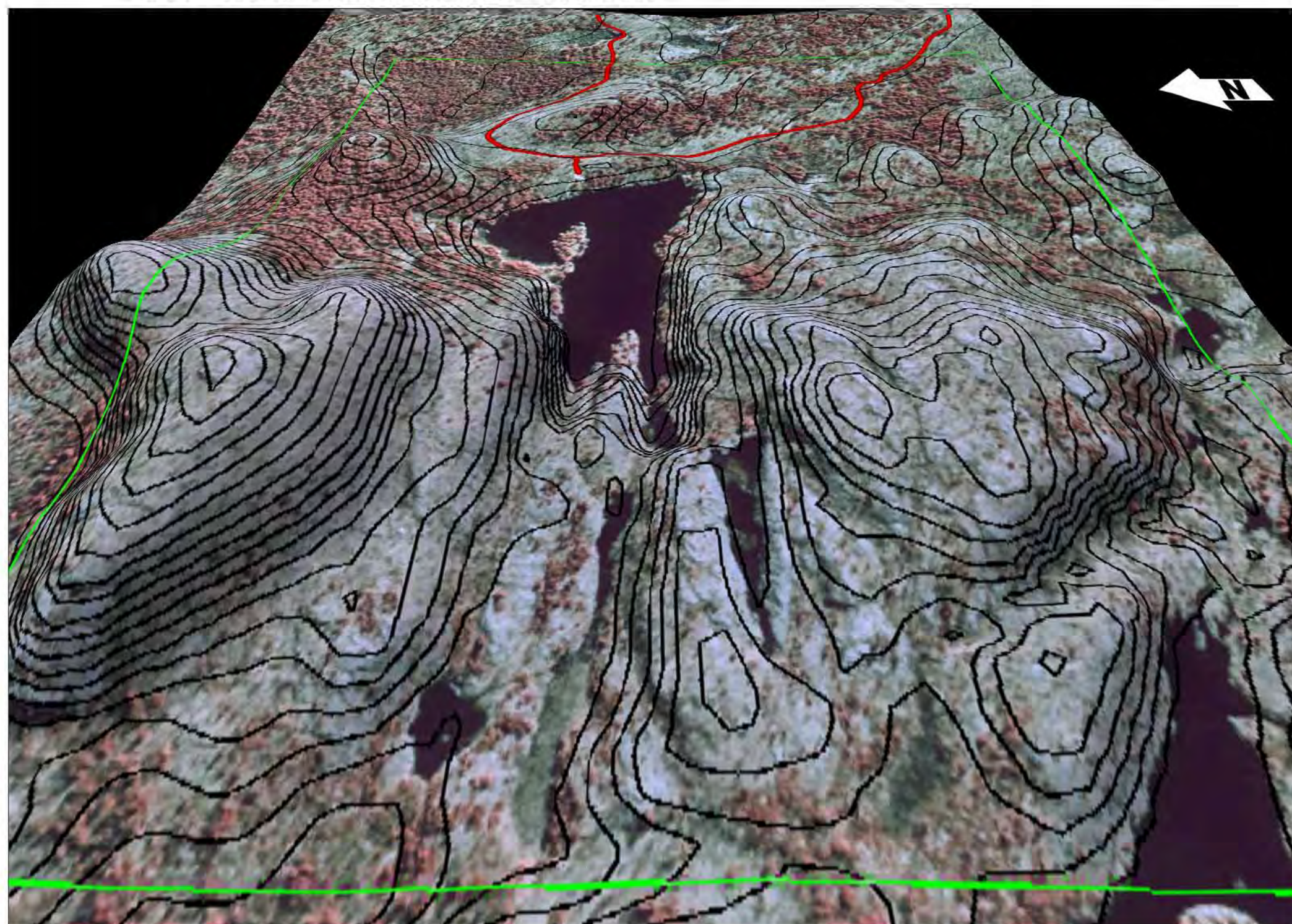


Echo Lake tract from 1998 color infrared aerial photo series using hill-shading effect. Green line is property boundary, and red lines represent roads. Reddish color is coniferous cover, while light green color tends to be deciduous cover.





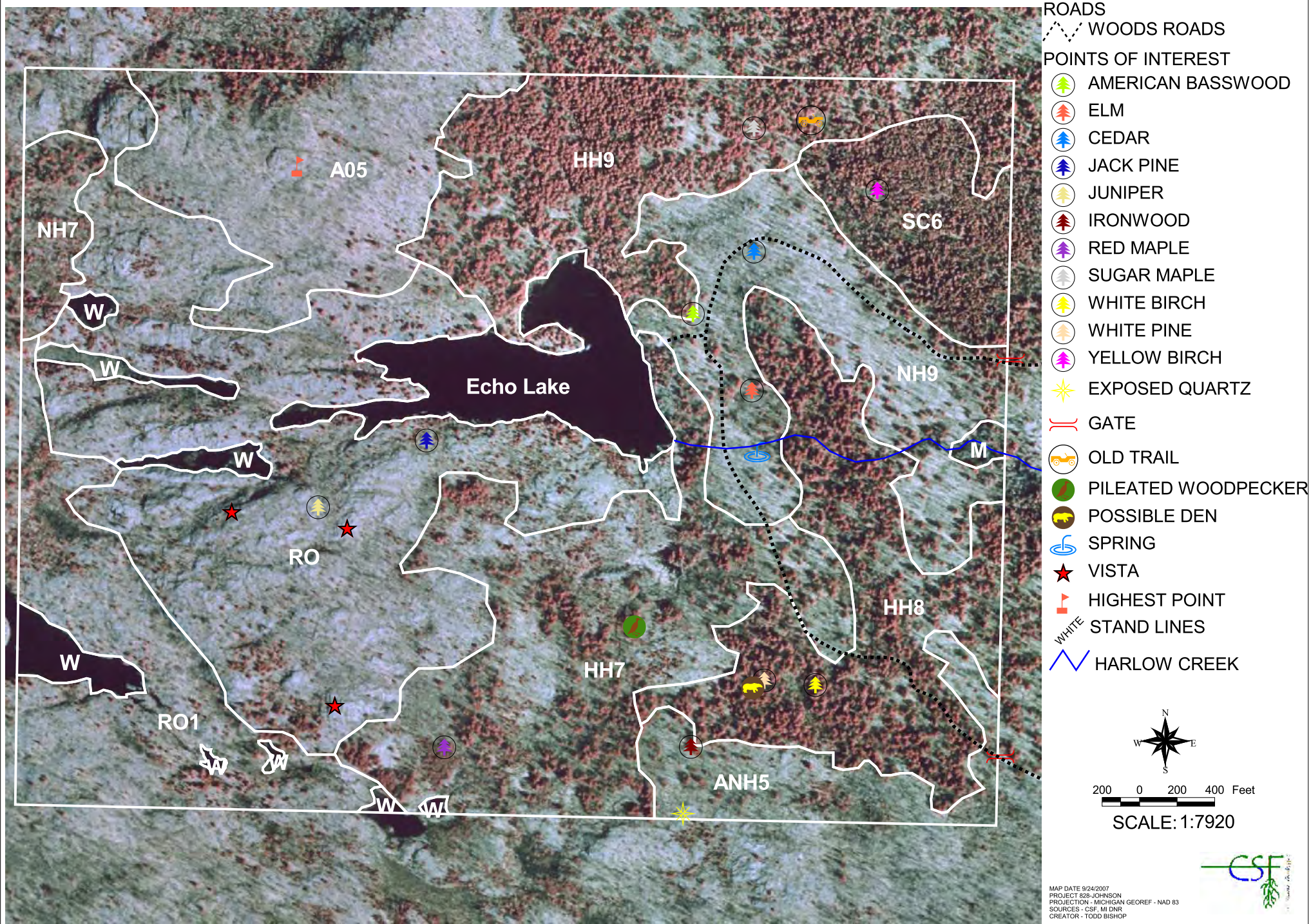
Echo Lake tract from 1998 color infrared aerial photo series using a three-dimensional viewpoint (2X vertical exaggeration). Black lines are generated contour lines at 5-foot intervals.





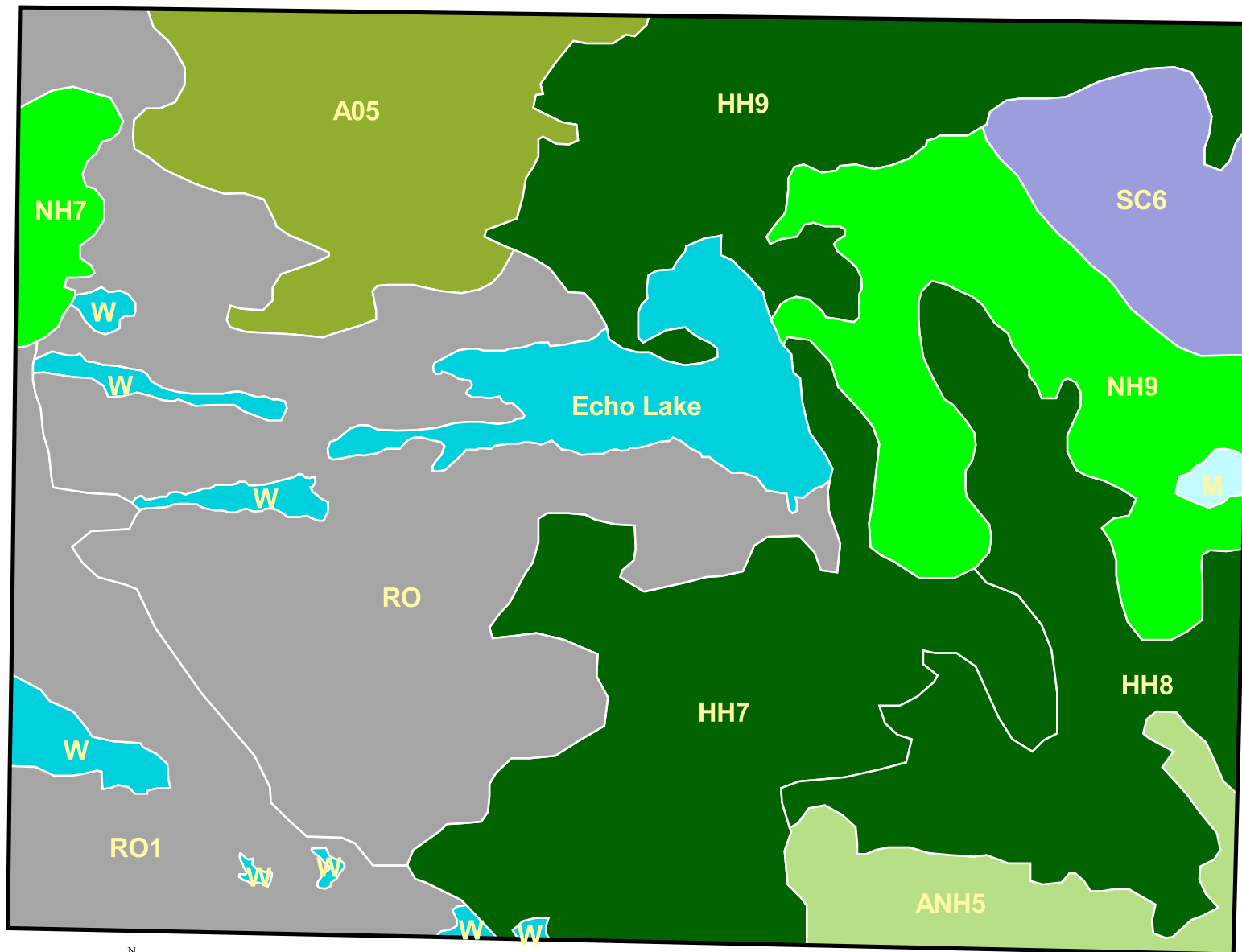
# ECHO LAKE

## 1998 IR COLOR AIR PHOTO WITH POINTS OF INTEREST





# ECHO LAKE COVERTYPE MAP - PHOTO AND GPS INTERPRETED



- PROPERTY BOUNDARY
- COVER TYPES
- ASPEN/OAK
  - ASPEN/NORTHERN HARDWOOD
  - ECHO LAKE
  - HEMLOCK HARDWOOD
  - NORTHERN HARDWOOD
  - ROCK OUTCROP
  - SWAMP CONIFER
  - WATER
  - MARSH

COVER TYPES	ACRES
ASPEN /OAK	41.2
ASPEN/NORTHERN HARDWOOD	17.6
ECHO LAKE/OTHER WATER	30.2
HEMLOCK /HARDWOOD	165.3
MARSH	1.2
NORTHERN HARDWOOD	52.5
ROCK OUTCROP	151.7
SWAMP CONIFER	20.3
TOTAL	480.0



200 0 200 400 Feet

SCALE: 1:7920

MAP DATE 9/24/2007  
PROJECT 628-JOHNSON  
PROJECTION - MICHIGAN GEOREF - NAD 83  
SOURCES - CSF, MI DNR  
CREATOR - TODD BISHOP

