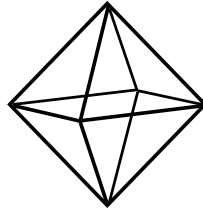


Kennecott Eagle Minerals Company  
1004 Harbor Hill Drive  
Suite 103  
Marquette, Michigan 49855  
Phone: 906-225-5791



# Kennecott Eagle Minerals

---

March 27, 2008

TO: Jon Cherry, KEMC

FR: John Meier, KEMC

CC: Steve Donohue, Foth Infrastructure & Environment

RE: 2007 Narrow-Leaved Gentian Survey

The 2007 update report for the Narrow-leaved Gentian investigation is attached for your information and files.

## 1. Introduction

Several Narrow-leaved Gentian (NLG) (*Gentiana linearis*) plants were found along the Salmon Trout River in the vicinity of the Eagle Project during the T & E baseline investigation in 2004 (WCR, 2005). The purpose of the original study in 2005 (Meier, 2005) was to determine the approximate distribution and populations of NLG in the general project area and adjacent areas of northern Marquette County. NLG is listed as a "facultative wetland" species in the State of Michigan, meaning that it can survive in wetland or upland conditions. In this investigation NLG plants were found in very wet conditions along streams and also in dryer conditions on the upper fringe of wetlands. The Michigan Natural Features Inventory (MNFI) considers the NLG a species of "threatened" status.

The investigation and this report are intended to document where NLG were observed in 2007 and a general assessment of the numbers of plants found. This was not an exhaustive investigation and the lack of a sighting in any particular area is not intended to infer that NLG do not exist in that area.

## 2. Study Area

The study area included the fringe areas along the Yellow Dog River, the Main Branch Salmon Trout River, and several streams to the west of the Eagle Project area to the Peshekee River (Figures 1, 2, and 3). Areas adjacent to the Triple A Road, West Branch Huron River Road, and Peshekee Grade were investigated. Also included in the investigation area was the area around Harvey Lake (Section 31, T47N-R25W), located on the Sands Plain south of the City of Marquette approximately 30 miles south of the Eagle Project site.

## 3. Results of Investigation

It should be noted that the hydrologic conditions during the summer of 2007 have been very dry after a dry 2006. Precipitation amounts have been below average. The Yellow Dog River at County Road AAR, the Middle Branch Escanaba River at Humboldt, and Peshekee River near Champion flow gages have all recorded record low flows during the months of July and August 2007.

### **Yellow Dog River**

Flowering NLG plants (Figures 5 and 6) were found in all areas investigated along the Yellow Dog River. This included areas from 0.7 miles downstream to 0.6 miles upstream of the Trail 5 bridge on the left (north) side of the river (Figure 2). The survey along the Yellow Dog River was conducted on August 13 and 14, 2007. Flowering NLG were observed in very wet areas in heavy organic soil along the Yellow Dog River and in the drier fringe areas in sandy soils several hundred feet from the river (Sections 13 and 14, T50N-R29W) (Figure 2). Additional flowering plants were observed in Section 24, T50N-R29W, south of the Yellow Dog River at the edge of the wetland near a bedrock outcrop (see Figure 2). There appeared to be fewer flowering NLG in 2007 than in 2005 and 2006 in the drier fringe areas surveyed. In the areas further from wetlands the NLG plants were smaller in 2007. Even though the survey was conducted during the middle of the flowering period reported by Chadde in the *"Field Guide to the Endangered and Threatened Plants of Michigan's Upper Peninsula"* (August and September), many flowers were brown and dried.

### **Salmon Trout River**

NLG were found along the Salmon Trout River on August 14, 2007, in approximately the same areas where they were recorded by Wetland and Coastal Resources in 2004 (WCR, 2005) and also observed in the 2005 and 2006 surveys (Meier, 2005 and 2006) (Figure 4). This area included the right side (north and east) of the Salmon Trout River from upstream of the ore body to a point just upstream (south) of the County Road IAA (Triple A Road) in Section 11, T50N-R29W. The number of plants observed several hundred in 2007 was about the same as in 2005 and 2006 (Meier, 2005 and 2006).

### **Area to the West of the Eagle Project**

The investigation continued west of the Eagle Project area along the Triple A Road to the West Branch Huron River Road and then on to the Peshekee Grade. These roads traverse western Marquette County, eastern Baraga County and then return to Marquette County at the Peshekee Grade (Figure 3). Flowering NLG were observed on August 14, 2007, at nearly all stream crossings along the road rights-of-way. They were observed in small borrow pits near the roads, sometimes in very dry perched areas in sand and gravel soils. At most locations at least fifty flowering plants were observed and sometimes several hundred plants were observed at single locations. The number of flowering NLG plants was approximately the same as in 2005 and 2006 (Meier, 2005 and 2006).

Approximately fifty NLG were also observed south of Lake Arfelin in Sections 21 and 22, T49N-R30W (Figure 3). The habitat in this location was a relatively dry bog adjacent to a small stream.

### **Harvey Lake**

NLG (several hundred) were observed along the southern shore of Harvey Lake (Section 31, T47N-R25W) in dry sandy soils. This year the plants were fewer in number and much smaller than in 2005 and 2006. Harvey Lake had no standing water in it this year.

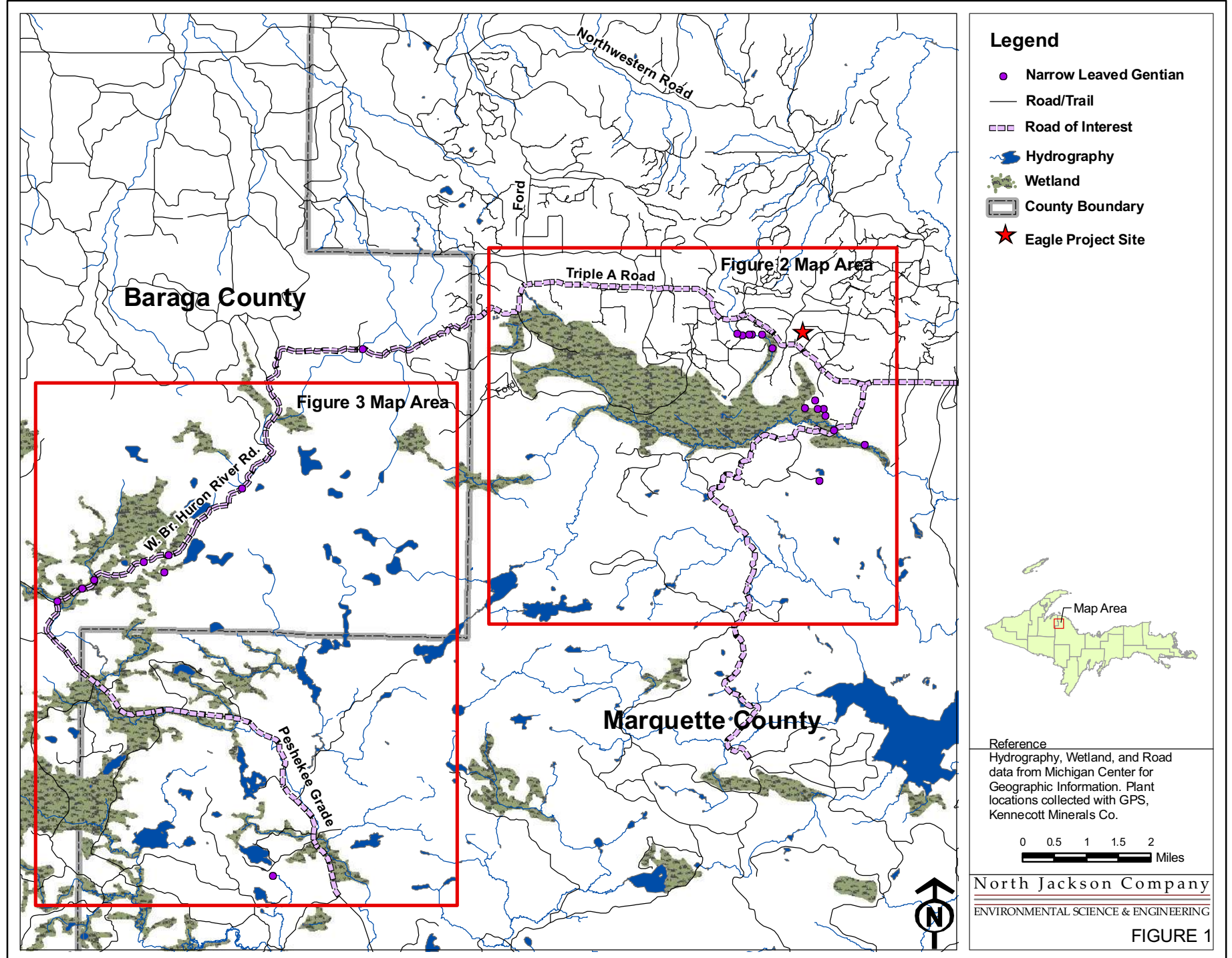
## **4. Conclusion**

Flowering Narrow-leaved Gentian plants proliferate in northern Marquette County and northeastern Baraga County. NLG were consistently found along and near streams in both wet organic soil and dry sand and gravel again during the 2007 investigation. NLG occur in the Eagle Project area as well as other areas in the region not near the Eagle Project.

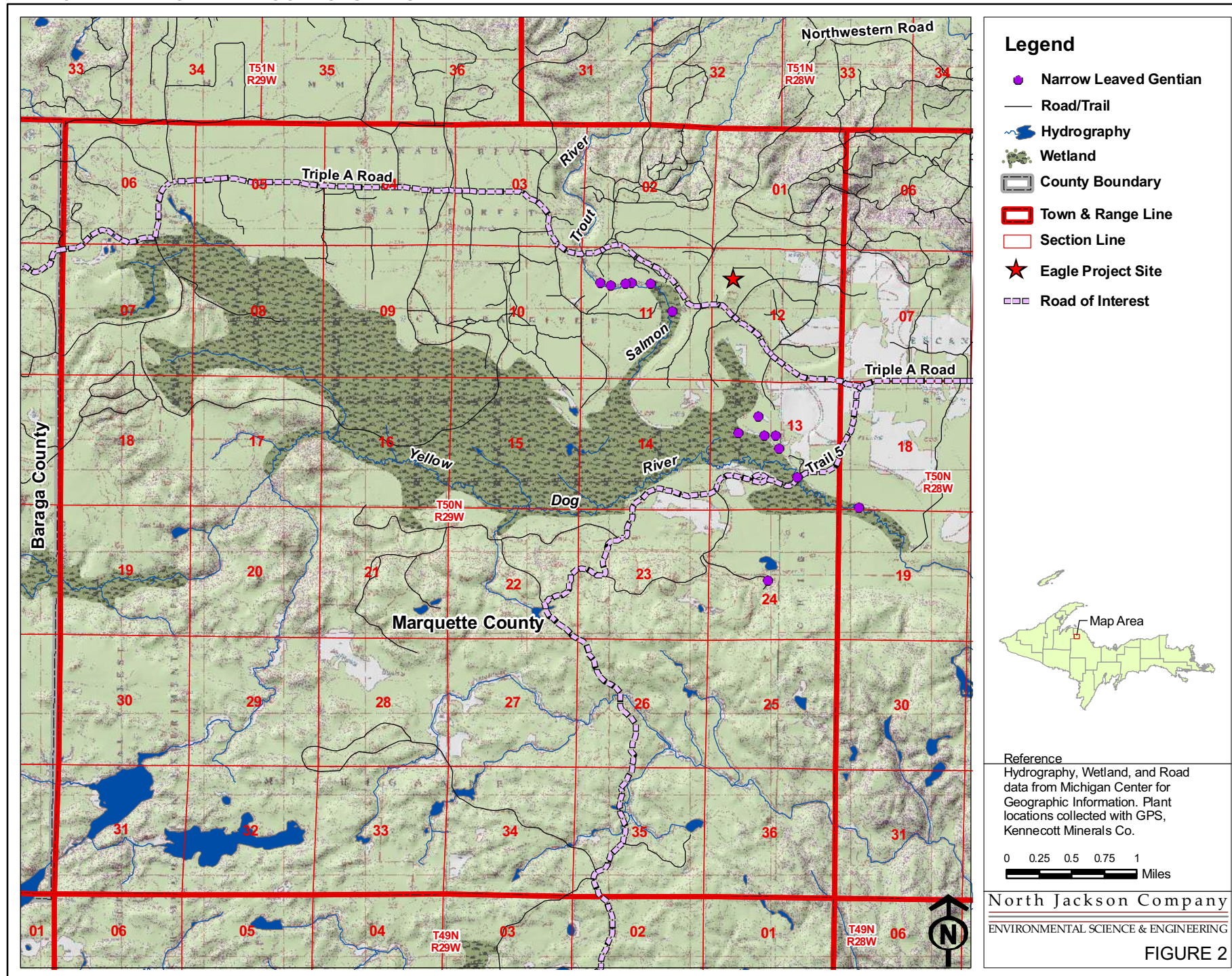
## 5. References

- Meier, John G., 2005. Narrow-leaved Gentian. Eagle Project Mining Permit Application, Volume IIF, Environmental Impact Assessment, Appendix F-2.
- Meier, John G., and North Jackson Company. 2006. Narrow-leaved Gentian Study – 2006 Update, Marquette and Baraga Counties, Michigan.
- Wetland and Coastal Resources (WCR). 2005. Threatened and Endangered Species Assessment. Eagle Project Mining Permit Application, Volume IIF, Environmental Impact Assessment, Appendix F-1.

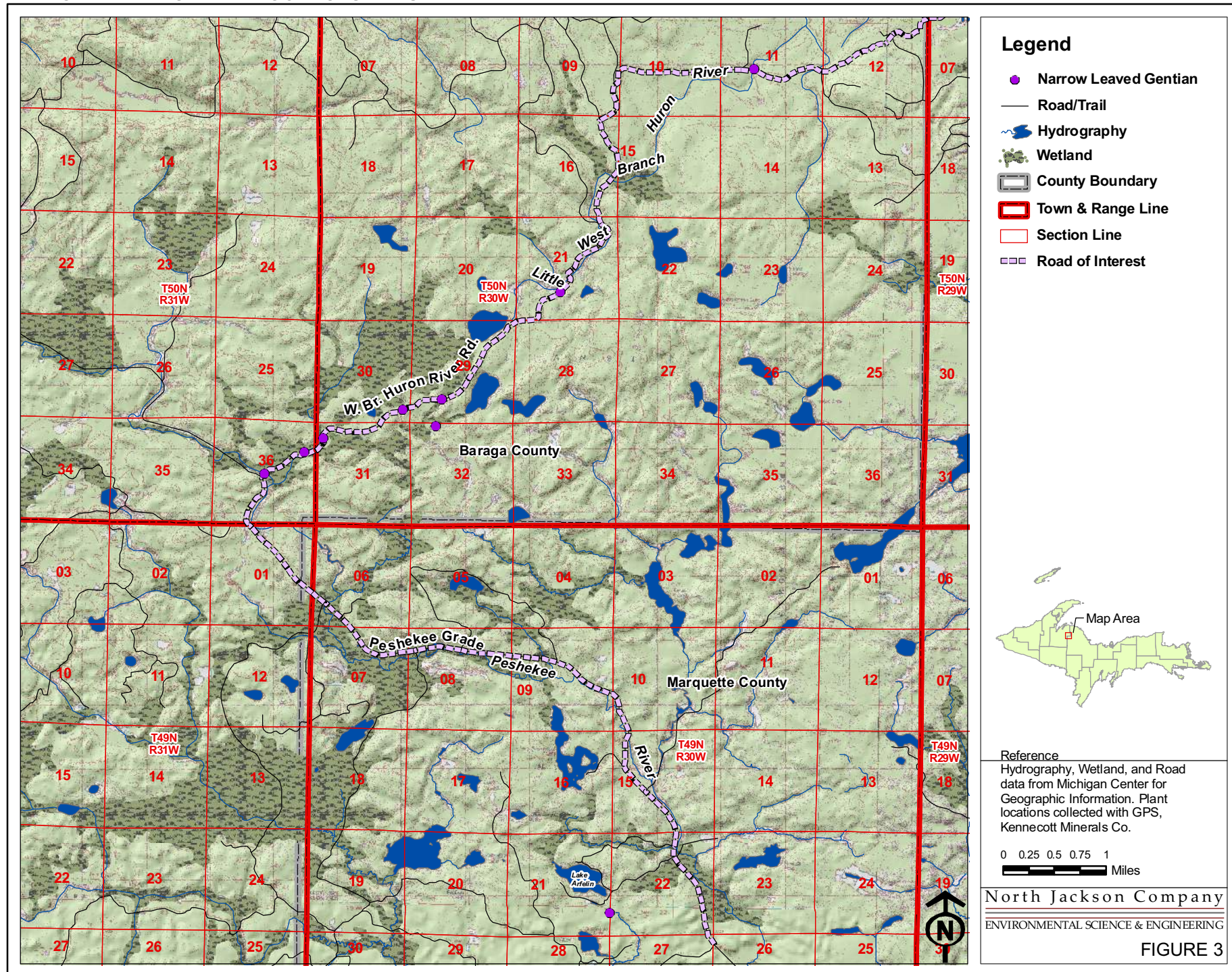
# NARROW LEAVED GENTIAN LOCATIONS-REGIONAL VIEW



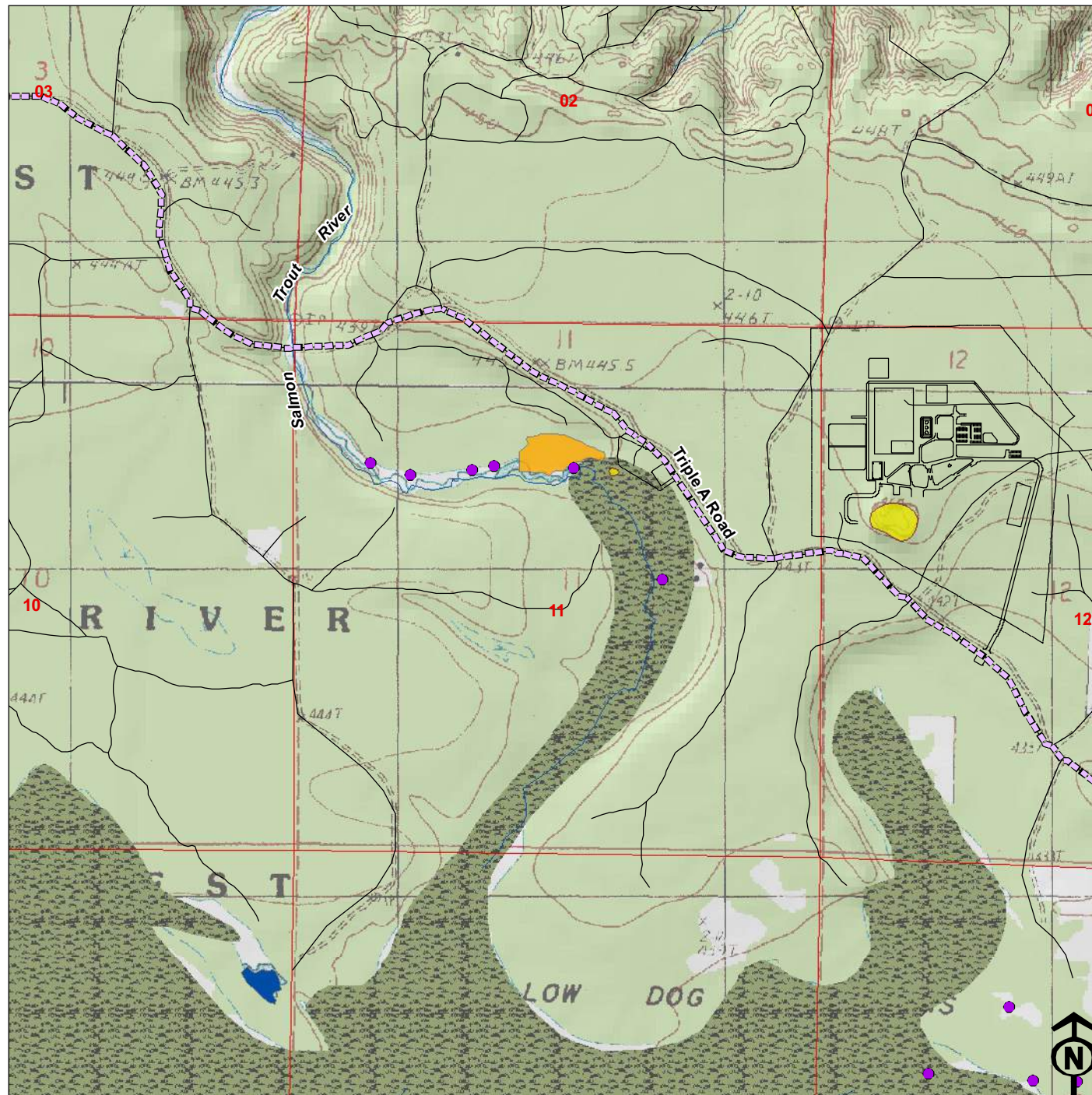
# NARROW LEAVED GENTIAN LOCATIONS - EAST



# NARROW LEAVED GENTIAN LOCATIONS - WEST



# NARROW LEAVED GENTIAN LOCATIONS - PROPOSED MINE AREA (T50N - R29W)



## Legend

- Narrow Leaved Gentian
- Road/Trail
- ~ Hydrography
- Wetland
- - - Section Line
- Ore Body
- Outcrop
- Eagle Project Site
- - - Road of Interest



## Reference

Hydrography, Wetland, and Road data from Michigan Center for Geographic Information. Plant locations collected with GPS, Kennecott Minerals Co.

0 500 1,000 1,500 Feet

North Jackson Company

ENVIRONMENTAL SCIENCE & ENGINEERING

FIGURE 4



Figure 5



Figure 6