

# *Lake County Fiber Optic Network*

## *Environmental Assessment*

USDA Forest Service  
Superior National Forest  
Laurentian, Kawishiwi, and Tofte Ranger Districts  
Lake and St. Louis Counties, Minnesota

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## CHAPTER 1 PURPOSE AND NEED

### 1.1 Document Structure

The Superior National Forest (SNF) has prepared this Environmental Assessment (EA) in compliance with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations. This EA discloses the direct, indirect, and cumulative impacts that could result from the proposed action and alternatives. The document is organized into four chapters:

*Chapter 1. Purpose and Need for Action:* The chapter includes information on the history of the project proposal, the purpose of and need for the project, the agency's proposal for achieving that purpose and need and the decision framework.

*Chapter 2. Alternatives, including the Proposed Action:* This chapter provides a more detailed description of the agency's proposed action as well as the no action alternative. This discussion also includes mitigation measures. Finally, this section provides a summary table of the environmental consequences associated with each alternative.

*Chapter 3. Affected Environment and Environmental Consequences:* This chapter describes the environmental effects of implementing the proposed action and other alternatives. This analysis is organized by issue and resource.

*Chapter 4. Consultation and Coordination, and References:* This chapter provides a list of preparers and agencies consulted during the development of the EA and a list of references used in the EA.

*Appendices:* The appendices provide more detailed information to support the analyses presented in the EA.

*Appendix A:* Stipulations

*Appendix B:* Cumulative Actions

*Appendix C:* Biological Assessment and Evaluation

*Appendix D:* Maps and Land List

Additional supporting documentation may be found in the project planning record located at the Supervisor's Office, Duluth, MN and on the SNF website. The project record is considered an unpublished appendix to the Environmental Assessment.

### 1.2 Introduction

Chapter 1 describes the purpose and need for the proposed Special-Use application for installation of fiber optic cable in Lake and parts of St. Louis Counties. Chapter 1 also describes

the proposed action, Forest Plan direction for the special-use authorization, and an outline of issues related to the project identified through scoping.

Analysis of the project, initiated through the NEPA, provides the framework for determining the effects of the proposed developments. The analysis in this EA will consider potential direct, indirect, and cumulative environmental impacts associated with the proposed activities. The Lake County Fiber Optic Network project would occur on three ranger districts of the SNF, and the deciding official will be the Forest Supervisor.

### **1.3 Purpose and Need**

The purpose is to evaluate and consider approving a Special-Use Authorization to allow Lake County to install, operate, and maintain fiber optic cable, both buried and aerial on existing utility poles, which is intended to increase the rural broadband utility services in the area. This would help meet Forest Plan Objective O-SU-2: “Attempt to meet demand for special use activities when consistent with the Forest Plan direction and when the proposed use cannot be accommodated on non-NFS land.”

Lake County received a loan and grant from Rural Utility Service (RUS) Broadband Initiatives Program (BIP) and American Recovery Reinvestment Act (ARRA) of 2009, for the purpose of installing and operating a fiber optic cable. The RUS number assigned to this project is MN1118-B40. The RUS project is needed to address the lack of broadband service for rural and un-served establishments within all of Lake County and portions of St. Louis County. Installation is anticipated to provide fiber-optic network services including voice, video, and data to thousands of residents, subscribers and multiple businesses in the area. The proposed installation cannot be accomplished without the use of non-NFS land since NFS land is located throughout the project area, including along the proposed installation locations.

### **1.4 Project Area**

The project area includes six route locations on the Superior National Forest where fiber optic cables are proposed to be installed, along with access routes. See Vicinity Map in Appendix D. None of these locations are within the Boundary Waters Canoe Area Wilderness (BWCAW).

### **1.5 Proposed Action**

The proposed action is to grant Lake County a Special Use Authorization to install, operate and maintain fiber optic cable. The area being identified for this project includes Tofte, Laurentian, and Kawishiwi Districts. The location of the cable is along existing road rights-of-ways and on existing utility poles. The majority of the cable will be buried where poles are nonexistent. Buried installation would be performed by using a vibratory plow, and directional bore machine. If ledge rock prohibits cable being buried, the cable would be covered with sackcrete and topsoil. Aerial installation to existing poles would be performed by using aerial lift bucket truck, reel truck, lasher, and cable winch. Occasional pedestals and drop cable (from aerial to buried) are

included in the project. The main routes are Highway 1, County State Aid Highway 2, 7, 16, and 18 and throughout the Ely area.

More information on the proposed action can be found in Chapter 2 under Description of Alternatives. Exact land description and location is identified in the land list and shown on maps in Appendix D. Installation shall occur in accordance with stipulations as outlined in Appendix A. Monitoring of the installation to verify compliance with stipulations would also occur (see Section 2.5).

All routes have previously been disturbed by either existing roads, utility poles, or buried utility cables. This project shall not interfere with any existing special-use authorization or land owner rights.

## **1.6 Management Direction, Laws, Policy and Agreements**

### **Broadband Loan and Grant Programs in the USDA's Rural Utility Service:**

Section 6103 of the Farm Security and Rural Investment Act of 2002 (P.L. 107-171) amended the Rural Electrification Act of 1936 to authorize a loan and loan guarantee program to provide funds for the costs of the construction, improvement, and acquisition of facilities and equipment for broadband service in eligible rural communities. The RUS/USDA houses two assistance programs exclusively dedicated to financing broadband deployment: the Rural Broadband Access Loan and Loan Guarantee Program and the Community Connect Grant Program.

### **Superior National Forest Land and Resource Management Plan (Forest Plan), 2004:**

This project is consistent with implementation of the Forest Plan and the Environmental Assessment tiers to the Forest Plan Final Environmental Impact Statement. All applicable Forest Plan Standards and Guidelines would be followed if an action alternative is selected. Relevant standards and guidelines were considered by Forest Service resource specialists and are evaluated in Chapter 3 and in the Biological Evaluation and Biological Assessment (see Appendix C).

The project meets the intent of Objectives as well as Standards & Guidelines for Special Uses O-SU-1, O-SU-2, and G-SU-1 in the Forest Plan:

Outside of the BWCAW, generally provide for utility transmission corridors and communication sites. Emphasize the use of common corridors and multiple use sites when granting appropriate right-of-ways (O-SU-1).

Attempt to meet demand for special use activities when consistent with Forest Plan direction and when the proposed use cannot be accommodated on non-NFS land (O-SU-2).

Whenever feasible, utility lines will be buried within existing road rights-of-way (G-SU-1).

The project also conforms to Management Area direction:

General Forest (D-GF-12) Buildings and structures may be provided to support resource management objectives. There may be occasional resorts, utility corridors, towers, dams, and similar structures.

General Forest (G-GF-3): Most special uses can be accommodated.

General Forest Long Rotation (D-LR-12): Buildings and structures may be provided to support resource management objectives. These may be occasional resorts, utility corridors, towers, dams, and similar structures.

General Forest Long Rotation (G-LR-3): Most special uses can be accommodated.

Recreation Use in a Scenic Landscape (D-RU-9): Buildings and structures may be provided to support resource management objectives. Structures include power lines, pipelines, and roads that serve recreational developments and private homesteads.

Recreation Use in a Scenic Landscape (G-RU-3): A wide variety of special uses is generally permitted.

Eligible Wild, Scenic, and Recreational Rivers (S-WSR-18): Existing special uses may be continued. New applications will be evaluated on their suitability relative to the river's value.

Semi-primitive Motorized Use (G-SPM-3): Special uses are generally not permitted, except those uses that do not detract from the semi-primitive environment or uses needed to access or supply utilities to private land, recreational facilities, or administrative sites.

### **1.7 Decision To Be Made**

Based on the analysis documented in this EA, the Forest Supervisor will decide whether to approve the proposed action to authorize a special use permit to install, operate, and maintain buried and aerial fiber optic cables with ancillary structures (pedestals and drop cables), to indicate if modifications to the proposal are needed, and to identify any mitigation measures and monitoring to minimize adverse environmental and social impacts of project implementation.

This project is an activity implementing a land management plan and not authorized under the Healthy Forest Restoration Act; therefore the decision is subject to Forest Service regulations at 36 CFR 218, Subparts A and B.

Only individuals or organizations who submit timely and specific written comments as defined at 36 CFR 218.2 regarding the proposed project during a public comment period established by the Responsible Official are eligible to file an objection to the decision on the project.



## 1.8 Scoping

Identifying issues related to the Proposed Action is accomplished by soliciting input from interested and affected parties, also referred to as “scoping”. Due to the lack of interest or comment on previous, similar projects to install fiber optic cable on the Forest, it was anticipated that there would be few, if any interested parties wanting to comment on this project. The project was listed in the fourth quarter of the 2013 Superior Quarterly, discussed with Lake County, and notification was sent to the Boise Forté, Fond Du Lac and Grand Portage Bands of the Lake Superior Chippewa. No external contacts or comments were received. Internal scoping was conducted by assembling an interdisciplinary team (IDT) of Forest Service employees in August of 2013 to identify issues related to the special use application.

### 1.8.1 Issues

Using the scoping comments, the interdisciplinary team developed a list of issues to address. These concerns and suggestions were considered in the analysis and addressed as necessary in the EA or project file. The SNF separated the issues into two groups: issues that drive alternatives and issues that do not drive alternatives. Issues that do not drive alternatives were identified as those:

1. outside the scope of the proposed action
2. already decided by law, regulation, Forest Plan, or other higher level decision
3. irrelevant to the decision to be made
4. conjectural and not supported by scientific or factual evidence
5. are limited in extent, duration, and intensity

A review of comments and information gathered during scoping revealed no issues that drove the formation of additional management alternatives. Minor modifications to the proposed action were made to address several minor resource issues identified by the Forest Service specialists.

The following concerns were addressed prior to accepting the special-use application and are addressed in the analysis of this EA.

- Any non-merchantable timber or brush that is cut should not be placed next to the right-of-way for fire suppression management efforts.
- Areas where buried cable crosses roads should be repaired back to its original level of maintenance.
- If cable is placed on existing utility poles, a pole agreement or lease should be submitted to the Forest indicating the pole owner allows this use on their facility.
- Any wetland, lake, creek, or river crossing that requires a permit from the Army of Corps of Engineers and/or State agencies should be obtained by Lake County prior to installation.

See the project file for further discussion on how scoping comments were considered in formulating alternatives and conducting the analysis.

### **1.9 Tribal Involvement**

Consultation letters were sent to the Boise Forte, Fond du Lac, and Grand Portage Bands of the Lake Superior Chippewa. No consultation was requested and no comments were received from the Bands.

## CHAPTER 2 DESCRIPTION OF ALTERNATIVES

### 2.1 Introduction

This chapter describes a no action alternative, and the proposed action. All alternatives will comply with policy, regulation, laws, and ordinances of the federal, state, county, and municipalities that are applicable to the area or operations covered by this proposal.

### 2.2 Alternatives Analyzed in Detail

#### Alternative 1, No Action

Under this alternative, the Forest Service would not authorize Special-Use Authorizations to install new fiber optic cables along road rights-of-way or on existing utility poles. Rural access to services including voice, video, and data to thousands of residents, subscribers and multiple businesses in the area would remain the same as it is currently, lacking in certain areas.

#### Alternative 2, Proposed Action

Under this alternative, the Forest Service would approve a Special-Use Authorizations to install, operate, and maintain buried fiber optic cables and aerial fiber optic cables on existing utility poles (with pole owner's agreement or lease) on National Forest System lands. Ancillary structures such as utility pedestals and drop cables would be authorized. Location of the lands in the special use permit are identified in the land list (Appendix D) and shown on maps (Appendix D). Installation shall be performed in accordance with the following stipulations (see also Appendix A).

#### Stipulations

1. The installation will be performed by direct insertion via cable plow with small amounts of trenching near termination points and vaults. The cable is to be a minimum of 36 inches below the existing grade. Where the ledge rock surface prohibits this depth, Lake County will place the cable as deep as possible and cover the cable with sackcrete. The sackcrete is to be covered with a minimum of 18 inches of topsoil and reseeded with a mix of native grasses and/or forbs.
2. When crossing gravel surfaced roads, any depression made with the cable plow or associated equipment will be filled with MnDOT Specification 3138, Class 5 gravel to meet the grade of the remaining road, compacted in maximum 3-inch lifts making the condition of the road equal or better than it was prior to being disturbed. Directional boring equipment will be used where direct insertion is prohibited due to obstacles or hard surfaced roadways and to cross rivers and streams.
3. For burial along Forest Service roads:
  - Notify Forest Service Zone Engineering a minimum of one week in advance of burial installation on each of the roads so the FS can plan Forest road maintenance activities to minimize potential conflicts.

- Bury the cable at least 5 feet beyond the end of all culverts and 5 feet outside of ditches or where isn't a ditch, 10 feet from the edge of the gravel shoulder.
  - If any culvert is damaged the applicant shall replace the entire culvert with the same length, diameter and gauge of steel as the existing and install the culvert with existing invert elevations.
  - Do not leave any vegetative debris, piles of soil or rock in the roadway, ditches and 10 feet from the edge of the gravel surface.
  - Any gravel surfacing damaged or removed as part of the project shall be replaced with MnDOT Specification 3138, Class 1 to the same depth as the existing, compacted in a maximum of 3-inch lifts.
4. Best management practices (BMPs) and Standard Operating Procedures (SOPs) designed to protect water quality shall be implemented. Applicable BMPs are found in the *Minnesota Forest Resources Council Voluntary Site Management Guidelines*. Applicable Compass Consultant SOPs include, but are not limited to, "Vibratory Plow", "Use of Boring Pits" and "Buried Fiber Optic Handhole". Directional drill pits shall not be left open overnight.
  5. Bi-weekly spill logs for spills occurring within the Superior National Forest shall be supplied electronically to a SNF hydrologist concurrent with notification to the Resident and in accordance with the Compass Consultants Standard Operating Procedure (SOP) "Notification Procedures for USACE". Emergency notification to an SNF hydrologist shall occur concurrent with notification to the Resident and/or Lake County representatives as described in the aforementioned SOP (Emily Creighton, hydrologist - [emilybcreighton@fs.fed.us](mailto:emilybcreighton@fs.fed.us); 218.365.7636).
  6. When crossing rivers and streams, the minimum depth of the directional bore will be four (4) feet below the channel. License must be obtained from the US Army Corps of Engineers and Minnesota Department of Natural Resources prior to crossing any river, lake, wetland or stream. Directional drill activities entrance and exit points shall be set back a minimum of 20 feet from the top of bank or delineated water resource.
  7. For the crossing at the Cloquet River, an eligible Recreational River waterway, the entrance and exit points of the directional bore shall be set back at least 50 feet from the top of bank, or far enough from the river so there is no disturbance to the river bank and riparian wetland/riparian corridor, whichever distance is greater.
  8. New utility poles or cable maintenance structures are not permitted in riparian or wetland areas.
  9. When installing ancillary structures such as pedestals, Lake County must verify ownership of land at that location to stay within the right-of-way.

10. During installation, signs are to be posted and traffic control individuals utilized where needed to inform drivers of the possible traffic hazards on any roads that may be affected.
11. Lake County must not interfere with any other existing Special-Use authorization such as road, telephone, fiber optic cable, or powerline rights-of-way previously issued.
12. Clearing of timber, brush, trimmed branches, and other debris (slash) removed from within the cleared right-of-way, shall be disposed of by scattering it away from any Forest system road or trail. The slash must be at least ten feet away from the road or trail, ensuring it lies within two to three feet height from the ground, or is chipped and scattered, or otherwise disposed of to the satisfaction of the Forest Service. No slash shall be deposited in lakes, meadows, streams, or other wetlands.
13. Contractors and other personnel installing cable shall retain in all vehicles information to allow them to identify Canada lynx. The Forest Service will provide this information. Sightings of suspected lynx should be reported to the U.S. Forest Service.
14. Utility poles can provide nesting structures for some bird species, including osprey, eagles, hawks, and ravens. If a nest is found during project implementation, activities should be temporarily halted and a Forest Service representative notified. The District Biologist will be consulted and appropriate mitigation measure(s) will be carried out prior to restarting activities.
15. For the Canada yew occurrence on Lake County Highway 7 that occurs about 50 feet northwest of Forest Service Road 1849, bury the fiber optic line only in the cleared right-of-way of Lake County 7 at this location.
16. Forest Service sensitive mussels have been documented near the Stony River Overlook (Township 60 North, Range 10 West, Section 26 (EO ID#33694)), which is part of the area where Lake County will be installing fiber optic cable. To mitigate impacts to sensitive mussels, Lake County shall implement and maintain soil erosion prevention measures and sediment control practices during and after installation of the fiber optic cable. This includes placing a commercial grade erosion barrier fence between the construction area and the water's edge at Stony River Overlook. The fence should be placed so no sediment will wash into the river (refer to the *Minnesota Forest Resources Council Voluntary Site Management Guidelines*). Once vegetation has stabilized the soil, the fence will be removed.
17. To prevent the spread of non-native invasive plants, remove all seeds, plant-matter, soil, and vegetative debris from heavy equipment prior to bringing the equipment onto the Superior National Forest.

### 2.3 Alternatives Considered But Not Carried Forward For Further Analysis

Minor modifications to the action described in the special use permit application were made and are incorporated into Alternative 2. These modifications include several of the stipulations shown in Section 2.2 and Appendix A.

### 2.4 Alternative Comparison

#### How the Alternatives Meet the Purpose and Need

	<b>Alternative 1 (No Action)</b>	<b>Alternative 2 (Approve Special Use Permit)</b>
Meet Purpose and Need?	No permit would be issued and the fiber optic cable would not be installed. The purpose and need would not be met.	The permit would be issued and the fiber optic cable would be installed. The purpose and need would be met.

#### Environmental Consequences of Alternatives

<b>Resource</b>	<b>Alternative 1 (No Action)</b>	<b>Alternative 2 (Approve Special Use Permit)</b>
Soil and Water	No effect	Minimal effect with stipulations
Threatened, Endangered and Sensitive Species	No effect	Not likely to adversely affect or no effect
Non-native invasive plant spread	No effect	Minimal spread with stipulations
Heritage	No effect	No effect
Recreation	No effect	Minimal effect
Wild and Scenic River Management Area direction	No effect	Minimal effect with stipulations

### 2.5 Monitoring

Initial monitoring would include oversight of contractors to ensure that all design and environmental specifications identified in the Special-Use Stipulations and other items identified in the EA (see Appendix A Stipulations) are adhered to and followed during construction.

If and when a special-use authorization is issued, inspections and reviews will be performed by the Special Use Administrator in accordance with Forest Service guidelines to ensure the Holder follows all terms and conditions set forth in the special use authorization. Some of these terms and conditions include but are not limited to:

- Preventive measures to limit non-native invasive plants

- Preventive measures to limit vandalism
- Prevent disturbance of heritage sites
- Forest road restoration

## CHAPTER 3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter describes the environmental effects to the resource if Alternative 2 (Proposed Action) is implemented. It provides the basis for the comparison of the alternatives with the Alternative 1 (No Action). Chapter 3 considers the direct, indirect, and cumulative effects of the project proposal to adjacent and surrounding resources. Appendix B displays cumulative actions considered for cumulative effects.

The Superior National Forest has evaluated and monitored other fiber optic installation projects and found minimal impacts (e.g. the Northeastern Service Cooperative Middle Mile Phase 2 Project). That analysis and monitoring is incorporated by reference into the analysis for the Lake County Fiber Optic Network Project. Because the project design and stipulations in the Lake County Fiber Optic Network Project are very similar to the Middle Mile Project, impacts are anticipated to be similar to that of the Middle Mile project, and would be minimal.

### 3.1 Water and Soil Resources

#### 3.1.1 Analysis Methods

The potential impacts of the project are evaluated with information on impacts from past fiber installation projects with very similar design features and mitigation measures (the Northeastern Service Cooperative Middle Mile Phase 2 Project) and any site-specific considerations for this project. This includes evaluating the potential for soil impacts where the fiber cable is installed, the crossing of the Cloquet River within the eligible Wild and Scenic River Management Area, other stream crossings, and effects to wetlands.

#### 3.1.2 Analysis Area and Timeframe

The analysis area includes the soil and water resources that intersect the proposed fiber optic installation route. This includes soils directly impacted by installation, and wetlands and streams adjacent to the routes that would be crossed during installation. Based on monitoring of similar projects (e.g. Middle Mile Phase 2 Project), this area covers the area of possible impact since the magnitude of effects from this type of project is confined to the road right-of-way.

The analysis timeframe is two years from the date of implementation since vegetation (grass, etc) would regrow and cover disturbed soil in that timeframe.

#### 3.1.3 Affected Environment

Road rights-of-way that would be affected by the project typically are previously disturbed and have grass, some shrubs, and few large trees. There may be ditches in some areas, occasional wetlands and stream crossings, and gravel and paved driveways.



### **3.1.4 Environmental Consequences Direct and Indirect Effects**

#### **Alternative 1 (No Action)**

The soil and water resources in the analysis area would remain similar to their current condition since no installation of fiber cable would occur.

#### **Alternative 2 (Proposed Action)**

Monitoring of similar projects (Northeastern Service Cooperative Middle Mile Phase 2 Project) has revealed only minimal adverse impacts to soil and water resources. Soil disturbance caused by cable installation is minimal since the vibratory plow disturbs a minimal area during installation, and any soil disturbance in the road right-of-way from the installation vehicle is revegetated within 1-2 years. Impacts to streams would be minimized through directional boring under the stream as permitted by the State of Minnesota, including at the eligible Wild and Scenic River crossing. Impacts to wetlands would be avoided, minimized and mitigated through the U.S. Army Corps of Engineers permitting process.

### **3.1.5 Cumulative Effects**

Alternative 1: Since there would be no direct or indirect effects under Alternative 1, there would be no cumulative effects.

Alternative 2: There are no ongoing or known reasonably foreseeable projects that will occur in the affected road rights-of-way. However, if such a project is planned, Lake County must coordinate to avoid and reduce additive impacts to traffic or environmental resources (see Section 2.2, Stipulations). Installation of the fiber cable on all ownerships would have similar effects to the proposed action and would follow similar stipulations and permit requirements. The direct and indirect effects of the fiber cable are anticipated to be minimal with the application of stipulations and any needed permits from the State of Minnesota and U.S. Army Corps of Engineers. If OHV use occurs in road rights-of-way where the fiber cable is installed, there may be some cumulative effects. The scale of these added impacts are considered nominal because direct and indirect effects are very localized and temporary.

## **3.2 Non-Native Invasive Plants (NNIP)**

### **3.2.1 Analysis Methods**

The potential impacts of the project are evaluated with information on impacts from past fiber installation projects with very similar design features and mitigation measures (the Northeastern Service Cooperative Middle Mile Phase 2 Project) and any site-specific considerations for this project. The analysis evaluates the likelihood of project activities to contribute to spread of NNIP, considering the location of activities and the suitable habitat that NNIP may colonize.

### **3.2.2 Analysis Area and Timeframe**

The analysis area is 100 feet on either side of location in the road right-of-way where fiber cable would be installed. This analysis area covers the potential location of NNIP spread since the roadside may include disturbed soils next to project activities. NNIP are generally unlikely to spread into forest adjacent to the road right-of-way since most NNIP in the area are shade-intolerant.

The analysis timeframe is 2 years since any NNIP introduction would occur during fiber cable installation and potential spread would occur within a few years thereafter.

### 3.2.3 Affected Environment

The invasive plant GIS layer was analyzed to determine the abundance of known non-native invasive plants along the right-of-way of the proposed project. Spotted knapweed, tansy, Canada thistle, St. Johnswort, and bull thistle are all found along the proposed right-of-way. The following table shows total abundance of non-native invasive plants in the project area. In general, there are numerous small, scattered infestations along most of the route growing in the cleared road right-of-way, but no invasives growing in the forest adjacent to the right-of-way.

Abundance of non-native invasive plants along main routes for Lake County Fiber Optic Network		
Route	Number of infestations	Acres of infestation
Lake County 2	79	1.9
Forest Highway 11	80	1.2
Minnesota Highway 1	188	3.6
Lake County 7	48	0.6

### 3.2.4 Environmental Consequences Direct and Indirect Effects

#### Alternative 1 (No Action)

NNIP populations in the analysis area would remain similar to their current condition since no installation of fiber cable would occur. Some spread would continue since existing use of the roadways would be a vector for spread.

#### Alternative 2 (Proposed Action)

Burying the fiber optic cable would cause a small amount of ground disturbance which would create a good site for the spread of non-native invasive plants. Furthermore, as the equipment moves down the right-of-way, it would pass through patches of invasives and could spread the roots or seed of existing invasives. So there could be a small increase of invasives due to project activities. NNIP spread would be confined to the roadside since the species are shade intolerant.

This increase would be limited by several factors. First, the footprint of the project would be very narrow due to the type of trenching equipment that would be used, and this would limit how

much weed spread occurs. Second, on the bigger roads like Forest Highway 11 and Lake County 2, much of the right-of-way is vegetated by vigorous non-native grasses which would likely grow back quickly in much of the disturbed area and compete with the invasives. Third, the project design includes equipment cleaning, which should limit how much invasive spread takes place.

### **3.2.5 Cumulative Effects**

Alternative 1: Since there would be no direct or indirect effects under Alternative 1, there would be no cumulative effects.

Alternative 2: One ongoing project would have a beneficial cumulative effect on NNIP. Non-native invasive plant treatments performed as part of the 2006 Non-native Invasive Plant Management Project (see Appendix B) would help limit the spread of invasives. There are no other ongoing or known reasonably foreseeable projects that will occur in the affected road rights-of-way. However, if such a project is planned, Lake County must coordinate to avoid and reduce additive impacts to traffic or environmental resources (see Section 2.2, Stipulations). Installation of the fiber cable on all ownerships would have similar effects to the proposed action and would follow similar stipulations and permit requirements. The direct and indirect effects of the fiber cable are anticipated to be minimal with the application of stipulations and any needed permits from the State of Minnesota and U.S. Army Corps of Engineers. If OHV use occurs in road rights-of-way where the fiber cable is installed, there may be some cumulative effects. The scale of these added impacts are considered nominal because direct and indirect effects are very localized and temporary.

## **3.3 Threatened, Endangered and Sensitive Wildlife Species**

### **3.3.1 Analysis Methods**

The potential impacts of the project are evaluated with information on impacts from past fiber installation projects with very similar design features and mitigation measures (the Northeastern Service Cooperative Middle Mile Phase 2 Project) and any site-specific considerations for this project. On April 25, 2012 a field review was conducted for a section of fiber optic cable installed in 2011 by the Northeast Service Cooperative (NESC) using the same approach as the proposed action. The disturbance area was less than 10 feet wide with occasional small-sized woody vegetation removed from the pathway, but the ground cover was rapidly re-growing in the disturbed areas. The entire length of the line was within the highway right-of-way maintained along the highway. No other disturbance extended beyond the right-of-way. Any impacts to wildlife habitat beyond the right-of-way were undetectable.

Management Indicator Habitats (MIH) and Management Indicator Species (MIS) form the basis to assess and monitor wildlife habitat. Changes in the amount and distribution of habitats and population levels as compared with composition guides provide reference against which to measure the effects of management. The proposed disturbance along the road rights-of-way will have miniscule impact on current vegetation. No substantial forest-wide impacts are expected in the amount and distribution of habitats and population levels for MIH and MIS due to the

relatively miniscule scale of this project. Therefore, no detailed MIS or MIH analysis is needed, but appropriate mitigation measures and Forest Plan Standards and Guidelines would be applied to these four sites.

The SNF wildlife inventory and MN-DNR Natural Heritage Information System (NHIS) GIS layer was compared to proposed project locations to determine the likelihood of occurrence. There are no known occurrences of Canada lynx or Regional Forester's Sensitive Species (RFSS) at any of the rights-of-way where fiber is proposed for installation. Regardless, it is assumed that suitable habitat conditions exist and is available for those species with moderate to high probabilities of occurrence.

### **3.3.2 Analysis Area and Timeframe**

The analysis area is defined by the road right-of way-where fiber cable would be installed. A 100-foot right-of-way buffer was used as a means of querying wildlife records given that the maximum right-of-way for a paved State highway on the Superior National Forest is approximately 100 feet (T. Hess, USDA Forest Service Realty Specialist, *personal communication*). This is an appropriate spatial scale for the analysis because this is where the disturbance from installation would occur and where potential impacts of the proposed action to threatened and sensitive species would be experienced.

The time period for direct, indirect, and cumulative effects analysis is two years from the time project activities begin. This time frame was chosen because most project activities should be completed within one year and re-vegetation of disturbed areas is expected to be completed within two years. While the fiber cable would be present beyond two years, disturbance associated with construction would have occurred and stabilized to the new environmental conditions and is unlikely to reach new areas during operation after this timeframe.

### **3.3.3 Affected Environment**

#### **3.3.4 Environmental Consequences Direct and Indirect Effects**

##### **Alternative 1 (No Action)**

The No Action alternative would not change the existing condition of habitat and species use at each site. This alternative would have no effect on Canada lynx and its critical habitat, and have no impact to RFSS. There are no cumulative effects with this alternative.

##### **Alternative 2 (Proposed Action)**

The proposed disturbance would have miniscule impact on current vegetation and habitat. No measureable forest-wide impacts are expected in the amount and distribution of habitats and population levels for MIH and MIS due to the relatively small scale of this project. Potential impacts to individuals include disturbance of large raptor nests on utility poles. Where these nests are discovered during implementation, stipulations (Section 2.2 and Appendix A) require that the utility pole be avoided, which would avoid this impact.

##### Canada Lynx

Changes in available lynx habitat would be negligible because of the small scale and extent of

the project. Constituent elements of Canada lynx critical habitat would not be measurably changed by the implementation of the proposed action. Based on the information in the Biological Assessment (Appendix B), Alternative 2 is expected to have *no effect* on Canada lynx and its critical habitat.

#### Northern Long-Eared Bat

The Biological Assessment (Appendix B) indicated that the spatial and temporal characteristics of project implementation will have *no effect* on the northern long-eared bat.

#### Regional Forester Sensitive Species

The Biological Evaluation (Appendix B) determined that this project would impact some species but not others. The various determinations of effect for RFSS are documented in Appendix A of the Biological Evaluation. The reasons for this determination are: changes in available habitat for some RFSS would be negligible because of the small scale and extent of the project, and the lack of suitable habitat affected by the project for other RFSS species. Alternative 2 *May Impact Individuals or Habitat* (MIIH) or have no effect to RFSS. There is no indication that the viability of any RFSS is at risk in the planning area based on this proposed project.

### **3.3.5 Cumulative Effects**

Alternative 1: Since there would be no direct or indirect effects under Alternative 1, there would be no cumulative effects.

Alternative 2: There are no ongoing or known reasonably foreseeable projects that will occur in the affected road rights-of-way. However, if such a project is planned, Lake County must coordinate to avoid and reduce additive impacts to traffic or environmental resources (see Section 2.2, Stipulations). The direct and indirect effects of the fiber cable are anticipated to be minimal with the application of stipulations and any needed permits from the State of Minnesota and U.S. Army Corps of Engineers. If OHV use occurs in road rights-of-way where the fiber cable is installed, there may be some cumulative effects. The scale of these added impacts are considered nominal because direct and indirect effects are very localized and temporary.

## **3.4 Heritage**

### **3.4.1 Analysis Methods**

The potential impacts of the project are evaluated with information on impacts from past fiber installation projects with very similar design features and mitigation measures (the Northeastern Service Cooperative Middle Mile Phase 2 Project) and any site-specific considerations for this project.

When a project is proposed on the Superior National Forest, heritage resource specialists assist in the analysis of potential project effects. Heritage analysis methods include 1) review of historic documents, archival materials, historic aerial photographs, past heritage survey coverage, and overviews relevant to the project area; 2) analysis of the proposed project and its potential to adversely affect heritage resources; 3) review of public comments concerning the proposed project and its potential effect; and 4) consultation with interested parties including tribes,

descendent communities, heritage advocacy groups, and the Minnesota State Historic Preservation Officer. Through this analysis, heritage resource specialists determine whether the project is an “undertaking” which has the potential to effect heritage resources within the project area.

Two types of survey methodology that are utilized by heritage resource professionals on the Superior National Forest include Block and Ground Surveys. Block surveys utilize helicopter flyovers to identify clearings and/or building remains associated with historic homesteads, logging camps, and linear features such as railroad lines. Heritage resources identified during a block survey are subsequently ground verified and mapped.

Ground surveys are conducted in areas which exhibit high-medium probability for buried archaeological sites. Such areas include islands, lakeshores, river margins, glacial features such as beach benches, and historic trail corridors.

### **3.4.2 Analysis Area and Timeframe**

The analysis area for direct and indirect effects of this project will focus on the federal lands within the rights-of-way where the fiber cable would be installed. Cumulative effects of the project will include all areas of ground disturbance on federal lands. The timeframe for direct, indirect and cumulative effects accompanies the ground disturbing activities and is approximately one year. This is because the ground disturbing activities would be completed within one year of permit issuance.

### **3.4.3 Affected Environment**

Since 1978, 77 heritage resource surveys have been conducted within the project area. Performed in conjunction with earlier Forest Service management activities, these surveys were conducted by professional cultural resource specialists and compiled with all applicable federal laws and standards. Included in this survey coverage are approximately 44 block aerial surveys and 33 intensive surveys. In August 2013, Trefoil Cultural and Environmental received an Archaeological Resources Protection Act (ARPA) permit to perform archaeological survey for the Lake County Fiber Optic Network Project on Forest lands. A final survey report was submitted to the SNF Heritage Resources Office for review in November 2013. One site was identified for avoidance (FS #05-404, prehistoric site). The project proponent (Compass Consulting) was then contacted by the Forest Archaeologist and the area of avoidance was addressed and agreed upon with Compass Consultants.

### **3.4.4 Environmental Consequences Direct and Indirect Effects**

#### **Alternative 1 (No Action)**

There would be no direct, indirect, or cumulative effects under Alternative 1 because there would not be any ground disturbing activities.

#### **Alternative 2 (Proposed Action)**

Heritage resource sites would be excluded from the ground disturbance, and the project proponent shall be notified of mitigation locations for avoidance. This would eliminate direct effects to the heritage resource. Post project monitoring of mitigation measures (site avoidance buffers) and maintenance of confidentiality with respect to heritage resource locations would

effectively eliminate impacts, thus heritage resources would experience no direct or indirect effects under Alternative 2.

The Superior National Forest has a signed Programmatic Agreement (PA) with the State Historic Preservation Office (SHPO) that directs the types of survey and consultation for heritage resources. The heritage review procedures have been reviewed by SHPO and are consistent with the provisions of the PA. The direct, indirect, and cumulative effects of the action alternative on heritage resources have been evaluated following the provisions of the PA. Based on the completed surveys, including data review and analysis, the Superior National Forest Heritage Program concludes that there would be no effects to heritage resources under the action alternative.

### **3.4.5 Cumulative Effects**

Implementation of mitigation measures (avoidance) and maintenance of confidentiality with respect to heritage resource locations would effectively eliminate direct and indirect effects as they relate to Alternative 2. Thus, there would be no cumulative effects to heritage resources, as all potential direct and indirect effects would be avoided.

## **3.5 Recreation**

### **3.5.1 Analysis Methods**

The potential impacts of the project are evaluated with information on impacts from past fiber installation projects with very similar design features and mitigation measures (the Northeastern Service Cooperative Middle Mile Phase 2 Project) and any site-specific considerations for this project.

### **3.5.2 Analysis Area and Timeframe**

The analysis area for direct, indirect and cumulative effects would be the road rights-of-way since that is where project activities and impacts would be limited in scale to the road right-of-way. The analysis timeframe would be 20 years since installed fiber cable would likely be present over the long term.

### **3.5.3 Affected Environment**

The area includes County Highway and Forest roads that are used for a variety of recreation activities. These include travel to a destination for activities such as hiking, camping, canoeing, hunting, snowmobiling, ATVing, and general driving for pleasure on the roads themselves.

### **3.5.4 Environmental Consequences Direct and Indirect Effects**

#### **Alternative 1 (No Action)**

There would be no direct, indirect, or cumulative effects under Alternative 1 because there would not be any ground disturbing activities.

#### **Alternative 2 (Proposed Action)**

The installation of fiber underground would have only short-term impacts since it would not be

noticeable after vegetation regrows on the road right-of-way (within 2 years of installation). Fiber installed on utility poles would create a long-term visual impact. The fiber would be installed on existing poles so the change would be to add a cable to poles with one or more existing cables. This would have a limited visual impact. While some recreation users may notice this change as intrusive, overall the recreational uses in the analysis would be unchanged.

### **3.5.5 Cumulative Effects**

Alternative 1: Since there would be no direct or indirect effects under Alternative 1, there would be no cumulative effects.

Alternative 2: There are no ongoing or known reasonably foreseeable projects that will occur in the affected road rights-of-way. However, if such a project is planned, Lake County must coordinate to avoid and reduce additive impacts to traffic or environmental resources (see Section 2.2, Stipulations). The direct and indirect effects of the fiber cable are anticipated to be minimal with the application of stipulations and any needed permits from the State of Minnesota and U.S. Army Corps of Engineers. If OHV use occurs in road rights-of-way where the fiber cable is installed, there may be some cumulative effects. The scale of these added impacts are considered nominal because direct and indirect effects are very localized and temporary.

## **3.6 Other Disclosures**

### **3.6.1 Civil Rights and Environmental Justice**

Forest Service activities must be conducted in a discrimination-free atmosphere. This would apply to construction activities that may occur upon implementation of communication site location improvement projects. Executive Order 12898 of February 11, 1994, Environmental Justice as part of environmental policy, calls for consideration of the environmental, health, and economic effects on minority and low-income areas including the consumption patterns of fish and wildlife. None of the routes proposed for installation are expected to have any direct, indirect, or cumulative effects on minorities and low-income populations.

### **3.6.2 Eligible Wild and Scenic Rivers**

The fiber cable installation includes the crossing of the Cloquet River, classified as a recreational river in the eligible Wild and Scenic River Management Area. Due to the design features (directional boring under the river) and the requirement to fulfill permit terms from the State of Minnesota, there would be no substantial impacts to the qualities of this river. Monitoring from past fiber cable installation (in project file) has shown that river crossings may be successfully completed while avoiding and minimizing impacts to the qualities of the river.



## CHAPTER 4-Consultation and Coordination, Glossary and References

### 4.1 List of Preparers

#### Analysis Team Members

Interdisciplinary Team Leader  
Todd Hess, Realty Specialist

Plant Specialist  
Jack Greenlee, Botanist

Wildlife Specialist  
Dave Grandmaison, Wildlife Biologist

Heritage Specialist  
Heather Hoffman, Archaeologist

Hydrology and Fisheries Specialist  
Emily Creighton, Hydrologist

Engineering Specialist  
Lori McIntyre, Civil Engineer

Recreation and Civil Rights Specialist  
Judy Ness, Natural Resource Recreation Manager

NEPA Specialist  
Peter Taylor, Environmental Coordinator

Consultants  
Brian (Mark) Pentecost, Kawishiwi District Ranger  
Sandy Skrien Public Service Team Leader  
Elizabeth Schleif, Real Estate Program Manager  
Elizabeth Youngstrom, Special Uses

### 4.2 Distribution Lists

This Environmental Assessment was distributed to the Forest mailing list of contacts. The distribution list is in the project record. In addition, the EA was sent to:

Jeffery S. Roiland, Fiber Network Project Manager – Lake County  
Jennifer K. Usgaard, CNRP, Regulatory Affairs Manager – Compass Consultants Inc.

### 4.3 References

Lake County Fiber Optic Network RUS/BIP (MN1118-B40), Fiber Network Project Manager Jeffery S. Roiland, *SF-299 Special-Use Application*, January 4, 2011. Submitted through Compass Consultants Inc.

RUS award letter to Lake County from Jonathan Adelstein, Administer of Rural Utilities Service to Derrick L. Goutermont, Commissioner of Lake County, dated September 10, 2010.

*Broadband Loan and Grant Programs in the USDA's Rural Utilities Service*, Congressional Research Service report dated July 12, 2013. Authored by Lennard G. Kruger, Specialist in Science and Technology Policy.

USDA Forest Service, Superior National Forest *Land and Resource Management Plan (Forest Plan)*. Eastern Region, Regional Forester Randy Moore, July 2004.

**Appendix A- STIPULATIONS**  
**Lake County Fiber Optic Network RUS/BIP (MN1118-B40)**  
**Fiber Optic Cable**  
**KAW100622**  
**No Bonding Required**

These stipulations are hereby issued in accordance with Clause III(C) of the Special-Use Permit for fiber optic cable, to which these stipulations apply, by the Forest Supervisor of the Superior National Forest. A District Ranger or the Forest Supervisor (Authorized Officer) will administer these stipulations where any construction, installation, clearing, or maintenance is carried out. These stipulations constitute a condition of the special use permit issued to the holder named thereon, hereinafter referred to as “the Holder.”

The Holder is hereby notified that all construction, installation, clearing, and maintenance will proceed in accordance with the terms and conditions of the permit as well as those identified in this stipulation.

**Stipulations**

1. The installation will be performed by direct insertion via cable plow with small amounts of trenching near termination points and vaults. The cable is to be a minimum of 36 inches below the existing grade. Where the ledge rock surface prohibits this depth, Lake County will place the cable as deep as possible and cover the cable with sackcrete. The sackcrete is to be covered with a minimum of 18 inches of topsoil and reseeded with a mix of native grasses and/or forbs.
2. When crossing gravel surfaced roads, any depression made with the cable plow or associated equipment will be filled with MnDOT Specification 3138, Class 5 gravel to meet the grade of the remaining road, compacted in maximum 3-inch lifts making the condition of the road equal or better than it was prior to being disturbed. Directional boring equipment will be used where direct insertion is prohibited due to obstacles or hard surfaced roadways and to cross rivers and streams.
3. For burial along Forest Service roads:
  - Notify Forest Service Zone Engineering a minimum of one week in advance of burial installation on each of the roads so the FS can plan Forest road maintenance activities to minimize potential conflicts.
  - Bury the cable at least 5 feet beyond the end of all culverts and 5 feet outside of ditches or where isn't a ditch, 10 feet from the edge of the gravel shoulder.
  - If any culvert is damaged the applicant shall replace the entire culvert with the same length, diameter and gauge of steel as the existing and install the culvert with existing invert elevations.
  - Do not leave any vegetative debris, piles of soil or rock in the roadway, ditches

and 10 feet from the edge of the gravel surface.

- Any gravel surfacing damaged or removed as part of the project shall be replaced with MnDOT Specification 3138, Class 1 to the same depth as the existing, compacted in a maximum of 3-inch lifts.
4. Best management practices (BMPs) and Standard Operating Procedures (SOPs) designed to protect water quality shall be implemented. Applicable BMPs are found in the *Minnesota Forest Resources Council Voluntary Site Management Guidelines*. Applicable Compass Consultant SOPs include, but are not limited to, “Vibratory Plow”, “Use of Boring Pits” and “Buried Fiber Optic Handhole”. Directional drill pits shall not be left open overnight.
  5. Bi-weekly spill logs for spills occurring within the Superior National Forest shall be supplied electronically to a SNF hydrologist concurrent with notification to the Resident and in accordance with the Compass Consultants Standard Operating Procedure (SOP) “Notification Procedures for USACE”. Emergency notification to an SNF hydrologist shall occur concurrent with notification to the Resident and/or Lake County representatives as described in the aforementioned SOP (Emily Creighton, hydrologist - [emilybcreighton@fs.fed.us](mailto:emilybcreighton@fs.fed.us); 218.365.7636).
  6. When crossing rivers and streams, the minimum depth of the directional bore will be four (4) feet below the channel. License must be obtained from the US Army Corps of Engineers and Minnesota Department of Natural Resources prior to crossing any river, lake, wetland or stream. Directional drill activities entrance and exit points shall be set back a minimum of 20 feet from the top of bank or delineated water resource.
  7. For the crossing at the Cloquet River, an eligible Recreational River waterway, the entrance and exit points of the directional bore shall be set back at least 50 feet from the top of bank, or far enough from the river so there is no disturbance to the river bank and riparian wetland/riparian corridor, whichever distance is greater.
  8. New utility poles or cable maintenance structures are not permitted in riparian or wetland areas.
  9. When installing ancillary structures such as pedestals, Lake County must verify ownership of land at that location to stay within the right-of-way.
  10. During installation, signs are to be posted and traffic control individuals utilized where needed to inform drivers of the possible traffic hazards on any roads that may be affected.
  11. Lake County must not interfere with any other existing Special-Use authorization such as road, telephone, fiber optic cable, or powerline rights-of-way previously issued.
  12. Clearing of timber, brush, trimmed branches, and other debris (slash) removed from within the cleared right-of-way, shall be disposed of by scattering it away from any

Forest system road or trail. The slash must be at least ten feet away from the road or trail, ensuring it lies within two to three feet height from the ground, or is chipped and scattered, or otherwise disposed of to the satisfaction of the Forest Service. No slash shall be deposited in lakes, meadows, streams, or other wetlands.

13. Contractors and other personnel installing cable shall retain in all vehicles information to allow them to identify Canada lynx. The Forest Service will provide this information. Sightings of suspected lynx should be reported to the U.S. Forest Service.
14. Utility poles can provide nesting structures for some bird species, including osprey, eagles, hawks, and ravens. If a nest is found during project implementation, activities should be temporarily halted and a Forest Service representative notified. The District Biologist will be consulted and appropriate mitigation measure(s) will be carried out prior to restarting activities.
15. For the Canada yew occurrence on Lake County Highway 7 that occurs about 50 feet northwest of Forest Service Road 1849, bury the fiber optic line only in the cleared right-of-way of Lake County 7 at this location.
16. Forest Service sensitive mussels have been documented near the Stony River Overlook (Township 60 North, Range 10 West, Section 26 (EO ID#33694)), which is part of the area where Lake County will be installing fiber optic cable. To mitigate impacts to sensitive mussels, Lake County shall implement and maintain soil erosion prevention measures and sediment control practices during and after installation of the fiber optic cable. This includes placing a commercial grade erosion barrier fence between the construction area and the water's edge at Stony River Overlook. The fence should be placed so no sediment will wash into the river (refer to the *Minnesota Forest Resources Council Voluntary Site Management Guidelines*). Once vegetation has stabilized the soil, the fence will be removed.
17. To prevent the spread of non-native invasive plants, remove all seeds, plant-matter, soil, and vegetative debris from heavy equipment prior to bringing the equipment onto the Superior National Forest.

## Appendix B- Cumulative Actions

The resource analyses provided in Chapter 3 use this information in the cumulative effects analysis. Instead of listing these projects numerous times under each resource section, they are provided here and resource analyses will refer back to this section.

### *Cumulative Effects area of analysis*

The cumulative effects area of analysis varies by resource area. See each resource section for definition of cumulative effects analysis area.

### *Past, present, and reasonably foreseeable actions*

The interdisciplinary team has made the following assumptions about activities on private, state or federal lands that may influence cumulative effects analysis for this project:

1. The scale of direct and indirect effects is limited to the road right-of-way where the fiber cable would be installed. This is based on monitoring of past fiber cable installation on the Forest (in project file) Therefore, actions which would also affect the road right-of-way where the cable would be installed are considered for cumulative effects. For effects to be cumulative, they need to overlap in time and space.

The following cumulative actions were considered for cumulative effects. There is one ongoing project in the analysis area. In April 2006, the Forest Supervisor decided to implement Alternative 2 of the Non-native Invasive Plant Management Project EA. Since then, the Superior National Forest has been conducting non-native invasive plant treatments in the analysis area, and these would continue through 2016. Otherwise, there are no ongoing or reasonably foreseeable projects occurring on the road rights-of-way where cable would be installed. However, ongoing use has the potential for cumulative effects:

- Motor vehicle use on the roads where cable would be installed. Highway legal vehicle use may contribute some effects such as spread of non-native invasive plants to roadsides in the road right-of-way. Other impacts are not anticipated since the highway legal vehicles would not actually travel on the road right-of-way.
- Some roads or road right-of-ways may experience use from off-highway vehicles (OHV) such as ATVs in more remote areas, particularly during hunting season (this may be illegal use if the route in question is closed to OHV). This use could result in spread of non-native invasive plants or impacts to soil and water resources in the road right-of-way.

# **Appendix C-Biological Assessment and Biological Evaluation**

## **Lake County Fiber Optic Special Use Permit**

Laurentian, Kawishiwi, and Tofte Ranger Districts

Superior National Forest

Federally Threatened and Endangered Species

&

Regional Forester Sensitive Species:

Terrestrial and Aquatic Wildlife and Invertebrates

and Sensitive Plant Species

Biological Assessment & Biological Evaluation

Prepared by: /s/ David D. Grandmaison  
Forest Wildlife Biologist

Date: November 6, 2013

/s/ Jason T. Butcher  
Aquatic Biologist

/s/ Jack Greenlee  
Forest Plant Ecologist

## Introduction

This Biological Assessment and Biological Evaluation documents the potential impact of the Lake County Fiber Optic project to the Federally-Threatened Canada lynx, its designated critical habitat, the northern long-eared bat recently proposed for Endangered status, and the Region 9 Regional Forester's Sensitive Species (*hereafter* RFSS – U.S. Department of Agriculture [USDA] Forest Service Manual section 2670.3, 2670.5[3], 2672.4) known or suspected to occur on the Superior National Forest (USDA 2011a).

## Management Direction

It is Forest Service policy to review all planned, funded, executed, or permitted programs and activities for possible effects to threatened, endangered, proposed or sensitive species (TES). The management objective is to maintain viable and well-distributed representation of all native species that occur on the Superior National Forest (National Forest Management Act Regulation 219.19 and 219.26, Secretary of Agriculture Regulation 9500-4, USDA Forest Service Manual 2670.12, 2670.22, and 2670.32, and Forest Plan p. 3-4). Working definitions for “viability” and “well-distributed” are taken from Iverson and René (1997):

- Viability – the likelihood that habitat conditions will support persistent and well-distributed populations over time.
- Well-distributed – species and habitat distribution are based on the current and historic natural distribution and dispersal capabilities of individual species, and dispersal includes the concepts of metapopulation dynamics and gene flow.

The Biological Assessment (BA) portion of this document was prepared in compliance with the requirements of Forest Service Manual Directives sections 2670.31, 2670.5(3), and 2672.4, the Endangered Species Act of 1973 as amended, and the National Forest Management Act of 1976. This BA tiers to the Programmatic BA for the Forest Plan Revision (USDA 2004a) and the Programmatic BA for the gray wolf, Canada lynx, and their critical habitats (USDA 2011b) but assesses project-specific impacts that may occur as a result of implementing the proposed action.

On October 18, 2013 the U.S. Fish and Wildlife Service (USFWS) updated the 90-day species list of threatened, endangered, experimental/non-essential, proposed, and candidate species that may occur within the Superior National Forest. This letter confirmed the following species and critical habitats that should be considered in project assessment:

- Canada lynx (*Lynx Canadensis*) – Threatened
- Canada lynx critical habitat
- Northern long-eared bat (*Myotis septentrionalis*) – proposed as Endangered

The Biological Evaluation (BE) portion of this document evaluates the effects of the proposed action on RFSS in compliance with Forest Service Manual Directives sections 2671.1 through 2672.43. The objectives of a BE are as follows (FSM 2672.41):

- To ensure that Forest Service actions do not contribute to the loss of viability of any native or desired non-native plant or animal species, or contribute to trends towards federal listing in compliance with the National Forest Management Act (1976).
- To comply with the requirements of the Endangered Species Act (1973 as amended), that actions of Federal agencies not jeopardize or adversely modify Critical Habitat for the



recovery of Federally listed species without a thorough analysis of the significance of such impacts.

- To provide a process and standard by which to ensure that threatened, endangered, proposed, and sensitive species receive full consideration in the decision making process.

This BE is also consistent with Executive Order 13186 that promotes the conservation and avoid or minimize adverse impacts on those RFSS that are migratory birds (USDA 2008), and to comply with the Migratory Bird Treaty Act (MBTA), the Bald and Golden Eagle Protection Act (BGEPA), and other pertinent statues (USDA 2008).

### **Description of the Proposed Action**

The proposed action is to grant Lake County a Special Use Authorization to install, operate, and maintain fiber optic cable along 6 routes on the Superior National Forest's Tofte, Laurentian, and Kawishiwi districts. Approximately 103.48 miles of fiber optic cable will be installed on the Superior National Forest as part of the overall 840 miles of cable installed across multiple ownerships. All routes have been previously disturbed by either existing roads, utility poles, or buried utility cables. The majority of the cable will be buried where poles are nonexistent. Buried installation would be performed by using a vibratory plow, and directional bore machine. If ledge rock prohibits cable being buried, the cable would be covered with sackcrete and topsoil. Aerial installation to existing poles would be performed by using aerial lift bucket truck, reel truck, lasher, and cable winch. Occasional pedestals and drop cable (from aerial to buried) are included in the project. The main routes are Highway 1, County State Aid Highway 2, 7, 16, and 18 and throughout the Ely area.

A detailed description of the actions for each route can be found in Chapter 2 of the Lake County Fiber Optic Network Environmental Assessment (EA) under Description of Alternatives (USDA 2013). Exact land description and location is identified in the land list included in the EA. Installation shall occur in accordance with stipulations as outlined in the EA. Monitoring of the installation to verify compliance with stipulations would also occur.

Field Review: On April 25, 2012 a field review was conducted for a section of fiber optic cable installed in 2011 by the Northeast Service Cooperative (NESC) using the same approach as the proposed action. The disturbance area was less than 10 feet wide with occasional small-sized woody vegetation removed from the pathway, but the ground cover was rapidly re-growing in the disturbed areas. The entire length of the line was within the highway right-of-way maintained along the highway. No other disturbance extended beyond the right-of-way. Any impacts to wildlife habitat beyond the right-of-way were undetectable.

### **Consultation with U.S. Fish and Wildlife Service**

As outlined by Section 7 of the Endangered Species Act, the Forest Service is required to enter into formal/informal consultation or conferencing with the U.S. Fish and Wildlife Service (USFWS) for any proposed activity that is likely to affect species federally listed as endangered, threatened, or proposed for listing or their critical habitat. On the Superior National Forest, the Canada lynx (*Lynx canadensis*) is listed as federally threatened and critical habitat has been

designated. Additionally, the USFWS published a public notification of their 12-month finding for the proposed listing of the northern long-eared bat (*Myotis septentrionalis*) in the Federal Register in October 2, 2013 (USFWS 2013). The proposed rule recommends that the northern long-eared bat be listed as an endangered species throughout its range although designation of critical habitat is not determinable at this time given a lack of information regarding the species biological needs.

Consultation is permissible but not required for a no effect determination and the USFWS does not issue concurrences for no effect determinations. This analysis finds that this project will have **no effect** on the federally listed Canada lynx or its critical habitat and **no effect** on the northern long-eared bat.

### **Affected Species**

No project-specific animal or plant surveys were conducted within the analysis area for this analysis. Existing reports and databases developed by Tofté, Laurentian, and Kawishiwi district biologists and the Minnesota Department of Natural Resources Natural Heritage Program database of element occurrences (MNDNR 2012) were reviewed for TES and Management Indicator Species (MIS) occurrence records. These data, along with Management Indicator Habitat (MIH) data modeled for the year 2012 were examined using a geographic information system (GIS) to determine if suitable habitat or known RFSS and TES occurrences were documented for the analysis area defined below. MIH represent groupings of forest cover types at varying age classes that serve as surrogates for ecological succession or vegetative growth stages and can be used as broad-scale measures of habitat for wildlife and plant species (Forest Plan, Appendix D). This approach and assumptions are described in the Forest Plan FEIS (Vol. 1, p. 3.3.1-2; Vol. 2, Tables DEIS-10 and DEIS-11 [USDA Forest Service 2004a]).

The species analyzed in this document are included because suitable habitat exists within the analysis area or these species are wide-ranging aerial species known to nest near the project area or may be present during implementation. This analysis is summarized in Appendix A and includes brief habitat descriptions for each species along with known occurrence and suitable habitat within the analysis area. Only those species known to occur or likely to occur within the analysis area and/or having suitable habitat in the analysis area were analyzed in detail in this document. For all other RFSS, **no impacts** are expected.

### **Analysis Area and Timeframe**

Only the proposed action is analyzed in this document. The potential impacts of the project are evaluated with information on impacts from past fiber installation projects with very similar design features and mitigation measures (e.g., the NESC Middle Mile Phase 2 Project) and any site-specific considerations for this project. The Superior National Forest has evaluated and monitored the Middle Mile fiber optic installation project and found minimal impacts (e.g., the NESC Middle Mile Phase 2 Project). That analysis and monitoring is incorporated by reference into the analysis for the Lake County Fiber Optic Network Project.

### ***Terrestrial and Aquatic Wildlife, Invertebrates, and Plants***

The analysis area for direct, indirect and cumulative effects is defined by the road right-of-way where fiber cable would be installed. A 100-foot right-of-way buffer was used as a means of

querying wildlife records given that the maximum right-of-way for a paved State highway on the Superior National Forest is approximately 100 feet (T. Hess, USDA Forest Service Realty Specialist, *personal communication*). This is an appropriate spatial scale for the analysis because this is where the disturbance from installation would occur and where potential impacts of the proposed action to threatened and sensitive species would be experienced.

The time period for direct, indirect, and cumulative effects analysis is two years from the time project activities begin. This timeframe was chosen because most project activities should be completed within one year and re-vegetation of disturbed areas is expected to be completed within two years. While the fiber cable would be present beyond two years, disturbance associated with construction would have occurred and stabilized to the new environmental conditions and is unlikely to reach new areas during operation after this timeframe.

### **Environmental Consequences**

Examination of the MNDNR Natural Heritage Program database (MNDNR 2012) and wildlife occurrence databases compiled by the Superior National Forest indicates that records of some RFSS do exist within the area defined for this analysis. In addition, suitable habitat for the species covered in this analysis is present within the analysis area (Appendix A).

#### ***Canada Lynx***

The proposed action will occur across 19 Lynx Analysis Units (LAUs) but all activities associated with the action will occur within previously disturbed and managed rights-of-way. Based on NESC monitoring data, vegetation will quickly re-establish along the 10-foot wide disturbance area where cable must be buried and return to pre-installation conditions managed within the right-of-way. In areas where the cable will be installed aerially to existing utility poles, the disturbance will have even less of an impact. As a result, the impact to any single LAU will be undetectable and un-measurable. There will be no increase in unsuitable habitat as a result of the proposed action. Similarly, the primary constituent elements of lynx critical habitat would not be measurably impacted during the 2-year analysis timeframe.

Suitable lynx habitat is well dispersed throughout the Superior National Forest and many of the proposed routes follow existing roadways that traverse denning, foraging, and/or connectivity habitat. Canada lynx monitoring data on the Superior National Forest include 48 locations within a 100-foot right-of-way buffer centered on the proposed fiber optic cable routes where lynx sign (e.g., tracks, scat, and prey kill sites) has been detected. However no known lynx denning sites fall within the right-of-way buffer and are unlikely to occur in these locations given the existing disturbance from the roadway. Furthermore, the proposed action will not change the vehicle collision risk associated with the existing roadways. Human access to lynx habitat would remain unchanged and no changes to road and/or trail density would result of the proposed action.

#### ***Northern Long-Eared Bat***

Survey efforts initiated by Superior National Forest biologists during the summer of 2013 suggest that northern long-eared bats can be detected, albeit at low numbers, across much of the forest where surveys are conducted (SNF, unpublished data). A total of 34 bats were captured and processed over nine nights of mist-netting at eight locations on the Kawishiwi Ranger

District. Northern long-eared bats comprised 38.2% (n = 13) of total captures and little brown bats (*M. lucifugus*) accounted for the remaining 61.8% (n = 21). Both reproductive adults and non-reproductive juveniles were detected.

Habitat use data from bat radio-telemetry efforts is limited but suggests that *Myotis* species on the Superior National Forest generally utilize cracks and crevices in live and dead aspen (*Populus tremuloides*) and white pine (*Pinus strobus*). These are mature trees (diameter at breast height [dbh] > 11 inches) on predominantly east facing aspects although slopes were generally gradual. Canopy closure in the surrounding stand tended to be high (62 – 98%) and stand composition was variable in nature. It should be noted that these data are preliminary and based on a small sample size (n = 5) with only two northern long-eared bats in the sample (SNF, unpublished data). Additional survey and monitoring efforts will occur in subsequent years.

Based on these data and the nature of the proposed action, there is no measurable risk of affecting forest bats. No large diameter trees will be impacted during project implementation. Roosting habitat is not likely to occur within the 100-foot right-of-way buffer. However, if roost sites occur adjacent to the project buffer, the species' propensity to switch roost regularly will mitigate an unforeseen disturbance. Furthermore, while forest bats are known to utilize forest openings and edges when foraging, fiber optic cable installation will occur during daylight hours when forest bats will be roosting.

***RFSS: Terrestrial and Aquatic Wildlife, Invertebrates, and Plants***

Occurrence data for the following RFSS were documented on Federal lands within the 100-foot right-of-way buffer centered on the proposed fiber optic cable routes: wood turtle (*Clemmys insculpta*) and northern goshawk (*Accipiter gentilis*). These two species along with gray wolf (*Canis lupus*) and bald eagle (*Haliaeetus leucocephalus*) were documented along roadways crossing non-Federal lands. While few occurrence data exist within the analysis area, it should be noted that these and other RFSS species may occur but go undetected where suitable habitat is bisected by existing roadways. Therefore, it is assumed that where suitable habitat conditions exist, those species may occur (Appendix A). However, given the negligible impact to existing habitat conditions and the temporary nature of cable installation, the probability and consequence of effects from the proposed action are either immeasurable or low (Appendix A).

The rights-of-way along proposed fiber optic routes are maintained in an open condition by the Minnesota Department of Transportation or County road crews and are generally not suitable nesting habitat for avian species that require trees as nest structures including: bay-breasted warbler (*Dendroica castanea*), Connecticut warbler (*Oporornis agilis*), olive-sided flycatcher (*Contopus cooperi*), American three-toed woodpecker (*Picoides tridactylus*), northern goshawk, bald eagle, boreal owl (*Aegolius funereus*), and great gray owl (*Strix nebulosa*). The lands affected may provide potential foraging habitat for these species with low to moderate probabilities of occurrence and may cause some of these species to temporarily avoid the areas where cable installation is occurring. Given the speed at which installation crews move, however, installation activity at any one location will be completed within approximately one day and have little to no lasting effect on these species (Appendix A).

There are no known wolf den sites near any of the fiber optic cable routes. Wolf use of rights-of-way along these routes is sporadic and unpredictable. As with foraging birds, cable installation may result in enough human activity to cause wolves to temporarily avoid the activity area. However, any disturbance during installation is unlikely to have a measureable effect on wolf activity beyond that of the already existing roadway.

Little brown bats (*M. lucifugus*) and tri-colored bats (*Perimyotis subflavus*) share key characteristics that warrant consideration as a group. These insectivores forage in and near forests (often at forest edges or in forest openings), form single- or multi-species maternity colonies and switch roosts frequently during the summer months. Superior National Forest biologists recently initiated a forest bat monitoring program whose objective was to inventory maternity roost sites using radio-telemetry techniques. Three little brown bats were tracked during the summer of 2013 (June – August) with an average tracking period of 14.5 days. During that time, each bat utilized a minimum of two roost sites. These sites included both mature live and dead aspen and pine. Roosting habitat is not likely to occur within the 100-foot right-of-way buffer. However, if present, and given the bats' ability to switch roost regularly, any temporary disturbance from the installation of fiber optic cable will have little, if any, effect on local bat populations. Use of forest edges during foraging will occur at night and will not coincide with cable installation activities.

Suitable habitat for taiga alpine (*Erebia disa mancinus*) and Nabokov's blue butterfly (*Lycaeides idas nabokovi*) and Freija's grizzled skipper occurs within the 100-foot right-of-way buffer and there are some known locations of this species adjacent to, but outside, the analysis area near Isabella and along portions of Lake County Highway 2 near McNair. Given the temporary nature of the disturbance associated with fiber optic cable installation impacts to these species will be negligible.

***RFSS: Aquatic***

Based on the proposed action and associated stipulations and mitigation measures, environmental consequences are immeasurable for aquatic RFSS. Minimal soil disturbance at river and stream crossings will occur since directional boring will be used and a minimum depth below channels (4 feet) will be maintained. Erosion control measures near streams will prevent sediment from entering the water. Permit requirements from the USACE (wetlands) and MNDNR (streams and rivers) will also avoid and minimize the potential for effects to RFSS aquatic species. Ground disturbance will be temporary in nature and will vegetate within a growing season, making sedimentation potential very minor. Given the negligible impact to existing habitat conditions and the temporary nature of cable installation the probability and consequence of effects from the proposed action are low for Aquatic RFSS (Appendix A).

***RFSS: Sensitive Plants***

There is one known occurrence of an RFSS plant, Canada yew (*Taxus canadensis*) within the 100-foot right-of-way buffer. The impacts to this occurrence would be minimal because the Canada yew grows in the cedar swamp adjacent to the right-of-way, and the fiber optic burying equipment will be restricted to the cleared right-of-way at this location (see mitigations).

There is suitable habitat for several other RFSS plants in the 100-foot right-of-way: least moonwort (*Botrychium simplex*), ternate grapefern (*B. rugulosum*), pale moonwort (*B. pallidum*), Michigan moonwort (*B. michiganense*), common moonwort (*B. lunaria*), neat spike rush (*Eleocharis nitida*), large-leaved sandwort (*Moehringia macrophylla*), and barren strawberry (*Waldsteinia fragarioides*). All of these species could potentially grow within portions of the right-of-way maintained in an open, non-forested condition. Burying the fiber optic cable could disturb the ground and uproot and kill individual plants that may occur in this type of habitat. Individuals of these species could be impacted, but it is likely that some individuals would not be disturbed by this linear impact and would remain intact and colonize the disturbed area after the cable is buried. Also, adequate colonies of these populations would remain elsewhere on the Forest thereby maintaining the viability of these species on the Forest.

Project activities could also result in the spread of non-native invasive plants that grow in the right-of-way. If non-native invasive plants spread they could degrade the habitat for some of the plants listed above. The likelihood of such impacts is expected to be low because project design includes equipment cleaning which should limit the spread of non-native invasive plant propagules, and because of on-going non-native invasive plant treatments associated with the 2006 Forest-wide Non-Native Invasive Plant Management Project.

Any of the RFSS plant species that grow outside of the clearing limits would not likely be impacted by this project since the fiber optic line burying would be within the cleared right-of-way.

## Determination of Effect

### *Canada Lynx*

This analysis finds that the proposed action will have *no effect* on the federally listed Canada lynx or its critical habitat because project implementation will result in a minimal spatial and temporal impact to already disturbed rights-of-way along the proposed fiber optic cable routes. Implementation will result in undetectable and un-measurable changes to lynx or prey habitat and will not involve the creation of new roads or trails that increase human access to lynx habitat or increase the risk of vehicle collision with lynx. Consequently, concurrence and/or formal consultation with USFWS were not initiated by the Superior National Forest.

### *Northern Long-Eared Myotis*

Based on data summarized in the USFWS proposed rule to list the northern long-eared bat and the emerging data regarding this species' distribution and habitat use on the Superior National Forest, this analysis finds that the proposed action will have *no effect* on the northern long-eared bat. Summer roosting habitat will not be affected by fiber optic cable installation and temporal overlap between project implementation and bat foraging activities will not occur. Consequently, conference with USFWS was not initiated by the Superior National Forest.

### *RFSS: Terrestrial and Aquatic Wildlife, Invertebrates, and Plants*

Effects determination for RFSS species are documented in Appendix A.

**Mitigations**

- Contractors and other personnel installing cable shall retain in all vehicles information to allow them to identify Canada lynx. The Forest Service will provide this information. Sightings of suspected lynx should be reported to the U.S. Forest Service.
- Utility poles can provide nesting structures for some bird species, including osprey, eagles, hawks, and ravens. If a nest is found during project implementation, activities should be temporarily halted and a Forest Service representative notified. The District Biologist will be consulted and appropriate mitigation measure(s) will be carried out prior to restarting activities.
- When crossing rivers and streams, the minimum depth of the directional bore will be four (4) feet below the channel. License must be obtained from the US Army Corps of Engineers and Minnesota Department of Natural Resource prior to crossing any river or stream.
- Forest Service sensitive mussels have been documented near the Stony River Overlook (Township 60 North, Range 10 West, Section 26 [EO ID#33694]), which is part of the area where Lake County will be installing fiber optic cable. To mitigate impacts to sensitive mussels, Lake County will be required to implement and maintain soil erosion prevention measures and sediment control practices during and after installation of the fiber optic cable. This includes placing a commercial grade erosion barrier fence between the construction area and the water's edge at Stony River Overlook. The fence should be placed so no sediment will wash into the river. Once vegetation has stabilized the soil, the fence will be removed.
- For the Canada yew occurrence on Lake County Highway 7 that occurs about 50 feet northwest of Forest Service Road 1849, bury the fiber optic line only in the cleared right-of-way of Lake County 7 at this location.

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**Attachment A**

BE Attachment A. Biological Assessment/Evaluation Summary for the Lake County Fiber Optic Project  
 Laurentian, Kawishiwi, and Tofte Ranger Districts, Superior National Forest  
 U.S. Forest Service - Region 9 Forester's Sensitive Species and Threatened and Endangered Species  
 (December 14, 2011 update)

**Likelihood of Occurrence in the Project Area and Determination of Effects**

<b>KEY:</b>					
<sup>a</sup> Suitable Habitat or Known Occurrence within Analysis Area		N = No, no suitable habitat in the analysis area or no known occurrences Y = Yes, suitable habitat is in the analysis area or there is a known occurrence			
<sup>b</sup> Determination of Effects		NI/NE = no impacts/effects MINL = may impact individuals but not likely to cause a trend to federal listing or a loss of viability LFLV = likely to result in a trend to federal listing or a loss of viability NLAA = may effect but not likely to adversely affect LAA = may effect and is likely to adversely affect BI = Beneficial impacts U = Impacts unknown			
Common Name	Scientific Name	Habitat Summary	<sup>a</sup> Suitable Habitat in Analysis Area	<sup>a</sup> Known Occurrence in Analysis Area	<sup>b</sup> Determination of Effects
<b>MAMMALS</b>					
Canada Lynx (Federally Threatened)	<i>Lynx canadensis</i>	Variety of habitats, adequate prey, low human disturbance	Y	Y	NE
Gray Wolf (MIS)	<i>Canis lupus</i>	Variety of habitats, adequate prey, low human disturbance	Y	Y	NI

Little Brown Myotis	<i>Myotis lucifugus</i>	Forages over open water and at the margins of water bodies and forests; winter hibernaculum: caves, mines, tunnels, buildings; summer: large diameter trees, loose bark, snags, wetlands, riparian	Y	N	NI
Northern Myotis (Proposed for Listing as Endangered)	<i>Myotis septentrionalis</i>	Forages in a cluttered environments under canopy along forested hillsides and ridges; Nursing colonies forage in forests near water; winter hibernaculum: natural caves, sand mines, and deep iron mines; summer: often associated with forested habitats, especially around wetlands	Y	N	NE
Tri-colored Bat	<i>Perimyotis subflavus</i>	Non-reproductive bats hunt in a wide variety of habitats; Nursing colonies forage in forests near water; winter hibernaculum: caves, mines, and tunnels, often occupying warmer, more humid portions compared to other spp.; summer: roosts often in trees	Y	N	NI
Heather Vole	<i>Phenacomys ungava</i>	Forest, brushland or clearcuts with <i>Vaccinium</i> spp and rocks	Y	N	NI
<b>BIRDS</b>					
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Mature/old-growth forested areas within 1/2 mile of fish-bearing water; large diameter white pine for nesting	Y	Y	MINL
Northern Goshawk (MIS)	<i>Accipiter gentilis</i>	Large diameter trees; patches of mature upland > 100 acres; contiguous canopy; open understory; conifer lowlands may be important as foraging habitat	Y	Y	MINL
Boreal Owl	<i>Aegolius funereus</i>	Mature and older boreal (including aspen) forest next to lowland conifer foraging areas; secondary cavity nester; large diameter hardwoods with cavities	N	N	NI

Great Gray Owl	<i>Strix nebulosa</i>	Tamarack bogs, sphagnum bogs, muskegs; large diameter trees for nesting; wet soil with >60% canopy closure; open areas for foraging; large lowland patches	Y	N	NI
Olive-sided Flycatcher	<i>Contopus cooperi</i>	Prefer lowland forests, but also use uplands; favor forest edges or other areas with sparse trees and snags or other suitable perches	Y	N	MINL
Bay-breasted Warbler	<i>Dendroica castanea</i>	Spruce budworm outbreaks; mature upland and lowland conifer patches greater than 50 acres	Y	N	NI
Connecticut Warbler	<i>Oporornis agilis</i>	Large lowland conifer patches with thick ericaceous understory	Y	N	NI
American Three-toed Woodpecker	<i>Picoides tridactylus</i>	Moist, swampy areas; mature coniferous forest with abundance of snags; large lowland patches; insects	Y	N	NI
<b>REPTILES</b>					
Wood Turtle	<i>Clemmys insculpta (Glyptemys)</i>	Upland and lowland habitats with suitable shade and insects for forage; riparian habitats with open sandy areas for nesting; sand bars in the St. Louis River drainage	Y	Y	MINL
<b>INVERTEBRATES</b>					
Taiga Alpine Butterfly	<i>Erebia mancinus</i>	Black spruce bogs and swamps; interspersed sedge meadows	Y	N	NI
Nabokov's (or Northern) Blue Butterfly	<i>Lycaeides idas nabokovi</i>	Inhabits various upland openings in the northern forest with low vegetation; presence of dwarf bilberry, a small shrub that forms mat-like colonies; in Minnesota, all known colonies of this butterfly occur at sandy sites	Y	N	NI
Freija's Grizzled Skipper	<i>Pyrgus centaureae freija</i>	Upland acidic meadow, scrubby willow, barrens; on SNF: known only from the McNair special management area in Lake Co.; boreal forest settings with disturbed areas from logging, an old saw mill and a railroad crossing	N	N	NI

Headwaters Chilostigman Caddisfly	<i>Chilostigma itasca</i>	Wet lowlands along small creeks; larval habitat unknown, adults prefer snow banks; species is winter active; adults active on sunny late winter days, even in frigid weather	Y	N	NI
Quebec Emerald Dragonfly	<i>Somatochlora brevicincta</i>	Lentic; habitat is bogs, fens, and heaths; microhabitat is water-suspended or water-saturated Sphagnum ("quaking bog" and "moss lawn") whether or not associated with open water, and typically showing graminaceous emergents indicating weak minerotrophism	Y	N	NI
Ebony Boghaunter	<i>Williamsonia fletcheri</i>	Lentic; habitat is bogs and fens; microhabitat is water-suspended or water-saturated Sphagnum ("quaking bog" and "moss lawn") whether or not associated with open water	Y	N	NI
<b>MOLLUSKS</b>					
Creek Heelsplitter	<i>Lasmigona compressa</i>	Medium to large rivers	Y	N	MINL
Black Sandshell	<i>Ligumia recta</i>	Headwaters of larger rivers; St. Louis river and tributaries; Lake of the Woods tributaries	Y	N	MINL
<b>FISH</b>					
Lake Sturgeon	<i>Acipenser fulvescens</i>	On SNF: large lakes and rivers in the Hudson Bay drainage	N	N	NI
Nipigon Cisco	<i>Coregonus nipigon</i>	Border Lakes near Canada with depth over 50 feet	N	N	NI
Shortjaw Cisco	<i>Coregonus zenithicus</i>	Lake Superior, Saganaga and Gunflint Lakes, possibly other deep Border Lakes	N	N	NI
Northern Brook Lamprey	<i>Ichthyomyzon fossor</i>	Warm, medium-sized, low-gradient streams with sections of higher gradient reaches suitable for spawning; ammocoete's require organically enriched, sandy substrate until metamorphosis	Y	N	MINL
<b>VASCULAR PLANTS</b>					

Moschatel	<i>Adoxa moschatellina</i>	Shaded damp cliffs and slopes in upland mature northern hardwood forest on North Shore	N	N	NI
Long-leaved Arnica	<i>Arnica lonchophylla</i>	Cool & moist cliffs and ledges on North Shore. Arctic disjunct	N	N	NI
Maidenhair Spleenwort	<i>Asplenium trichomanes</i>	In crevices of moist, mostly east-facing cliffs, ledges, and talus, Rove formation	N	N	NI
Alpine Milkvetch	<i>Astragalus alpinus</i>	Sandy, gravelly fluctuating shorelines with sparse vegetation. Inland strand beach - sparse vegetation	N	N	NI
Swamp Beggar-ticks	<i>Bidens discoidea</i>	Wet habitats: silty shores, hummocks in floating mats and swamps, partly submerged logs	N	N	NI
Lance-leaf Grape-fern	<i>Botrychium lanceolatum</i> var. <i>angustisegmentum</i>	Northern hardwood forest, old fields, old logging roads, trails	N	N	NI
Common Moonwort	<i>Botrychium lunaria</i>	Open habitats such as old log landings, sawmill sites, old building sites	Y	N	MINL
Michigan Moonwort	<i>Botrychium michiganense</i> ( <i>hesperium</i> )	Open habitats such as old log landing, old dirt roads, gravel pits, powerline corridors, borrow pits. Also beach ridges, old fields, trails, and dredge spoil dumps (Walton 2000a)	Y	N	MINL
Goblin Fern	<i>Botrychium mormo</i>	Mesic northern hardwood forest with thick leaf litter layer	N	N	NI
Pale Moonwort	<i>Botrychium pallidum</i>	Open, disturbed habitats, log landings, roadsides, dunes, sandy gravel pits.	Y	N	MINL
Ternate Grape-fern	<i>Botrychium rugulosum</i> (= <i>ternatum</i> )	Generally open habitats, such as old log landings and edges of trails.	Y	N	MINL
Least Moonwort	<i>Botrychium simplex</i>	Generally open habitats, such as old log landings, roadside ditch, trails, open fields, base of cliff, railroad rights-of-way	Y	N	MINL
Floating Marsh-marigold	<i>Caltha natans</i>	Perennial herb; shallow water of pools, ditches, sheltered lake margins, slow moving creeks, sloughs and oxbows, pools in shrub swamps	N	N	NI

Fairy Slipper	<i>Calypso bulbosa</i>	Hummocks in northern white cedar swamps, moist to wet lowland conifer swamps, and to lesser extent in upland coniferous forests (Smith 1993)	N	N	NI
New England Sedge	<i>Carex novae-angliae</i>	Moist woods with sugar maple, also with birch, aspen, tall shrubs; yellow birch and white spruce dominated forest (USDA Forest Service 2002a, L. Gerdes pers. com)	N	N	NI
Ross' Sedge	<i>Carex rossii</i>	Rocky summits, dry exposed cliff faces, rocky slopes, in east Border Lakes subsection	N	N	NI
Douglas's Hawthorn	<i>Crataegus douglasii</i>	North Shore rocky, gravelly streambeds/banks and open areas; and rocky borders of woods	N	N	NI
Ram's-head Lady's Slipper	<i>Cypripedium arietinum</i>	Wide variety of forests, both upland and lowland, but in MN predominantly in white cedar swamps; also in forests dominated by jack pine, red pine, or white pine	N	N	NI
Linear-leaved Sundew	<i>Drosera linearis</i>	Minerotrophic water tracks in patterned peatlands	N	N	NI
Neat Spike-rush	<i>Eleocharis nitida</i>	Mineral soil of wetlands, often w/ open canopy and disturbance, such as logging roads/ditches through wetlands	Y	N	MINL
Appalachian Fir Club Moss	<i>Huperzia appalachiana</i>	Shelves and crevices on cliff/talus/rock outcrops, and shrub dominated talus piles	N	N	NI
Moor Rush	<i>Juncus stygius</i>	Shallow pools in non-forested peatlands, often in a sedge-dominated community	N	N	NI
Creeping Rush	<i>Juncus subtilis</i>	Sandy lakeshore – only known occurrence in BWCAW	N	N	NI
Auricled Twayblade	<i>Listera auriculata</i>	On alluvial or lake-deposited sands or gravels, with occasional seasonal flooding, associated with riparian alder or spruce/fir forest	N	N	NI

American Shore-grass	<i>Littorella uniflora</i>	Shallow margins of nutrient-poor lakes, seepage lakes, sandy substrate, may have fine gravel/organic soil. Fluctuating water level up to about 1 meter.	N	N	NI
Large-leaved Sandwort	<i>Moehringia macrophylla</i>	Cliffs/rock outcrops, talus, conifer sites on shallow soils, pine plantation with rocky outcrops; usually semi-open shrub or tree canopy	Y	N	MINL
Fall Dropseed Muhly	<i>Muhlenbergia uniflora</i>	Wet sandy beaches, floating peat mats	N	N	NI
Dwarf Water-lily	<i>Nymphaea leibergii</i>	Slow moving streams, rivers, beaver impoundments 1-2 m deep. Occurs at outer margin of emergent vegetation.	N	N	NI
Chilean Sweet Cicely	<i>Osmorhiza berteroi</i>	Northern hardwood forest dominated by sugar maple on North Shore	N	N	NI
Sticky Locoweed	<i>Oxytropis viscida</i>	Slate cliffs and talus slopes in east Border Lakes subsection. Arctic/alpine disjunct	N	N	NI
Canada Rice Grass	<i>Piptatherum canadensis</i>	Sandy/gravelly soil; red pine/jack pine plantations, borders, edges, trailsides, openings	N	N	NI
Rough-fruited Mandarin	<i>Prosartes trachycarpa</i>	Rich, shady deciduous forests, aspen groves to open coniferous forests	N	N	NI
Western Jacob's Ladder	<i>Polemonium occidentale ssp. lacustre</i>	Primarily white cedar swamps, also mixed conifer swamps; thrives in openings (Carlson and Sather 2001)	N	N	NI
Braun's Holly Fern	<i>Polystichum braunii</i>	Cool, shady cliffs and slopes in northern hardwoods in North Shore Highlands subsection	N	N	NI
Oakes' Pondweed	<i>Potamogeton oakesianus</i>	Bogs, interdunal boggy pools, lakes, and streams	N	N	NI
Lesser Wintergreen or Small Shinleaf	<i>Pyrola minor</i>	Black spruce swamps, and ecotone between uplands and lowland alder/conifer swamp, prefers closed canopy	N	N	NI
Cloudberry	<i>Rubus chamaemorus</i>	Black spruce/sphagnum forest, acidic. Superior NF at southern edge of species range	N	N	NI



Nodding Saxifrage	<i>Saxifraga cernua</i>	Cliffs, ledges, diabase cliff (calcium based feldspars). Arctic/alpine disjunct. One location in MN on open cliff.	N	N	NI
Encrusted Saxifrage	<i>Saxifraga paniculata</i>	Cliffs, sheltered crevices, and ledges of north-facing cliffs; Arctic/alpine disjunct	N	N	NI
Awlwort	<i>Subularia aquatica</i>	Beach zone of sandy nutrient-poor lakes. Shallow lake margins. Submerged or emerged, or stranded. 15-45 cm deep water, but can occur deeper. Can flower while stranded, or under other conditions.	N	N	NI
Canada Yew	<i>Taxus canadensis</i>	Wide variety of uplands and lowlands, including cedar/ash swamps, talus and cliffs, northern hardwoods, aspen/birch forest (Walton 2001, Schmolter 2001, USDA Forest Service 2004a)	Y	Y	MINL
False-asphodel	<i>Tofieldia pusilla</i>	Sedge mats at edges of shoreline rock pools along Lake Superior. Arctic disjunct.	N	N	NI
Lance-leaved Violet	<i>Viola lanceolata</i>	Sandy to peaty lakeshores; borders of marshes and bogs, damp sand ditches	N	N	NI
Barrenstrawberry	<i>Waldsteinia fragarioides</i>	Upland coniferous and deciduous forests, in recently harvested areas, established plantations, and areas with no recent harvest	Y	N	MINL
Smooth Woodsia	<i>Woodsia glabella</i>	Moist, north-facing cliffs along Lake Superior. Arctic disjunct.	N	N	NI
<b>NON-VASCULAR PLANTS</b>					
A Lichen spp.	<i>Arctoparmelia centrifuga</i>	Sunny rocks and open talus slopes	N	N	NI
A Lichen spp.	<i>Arctoparmelia subcentrifuga</i>	Sunny rocks and open talus slopes	N	N	NI
A Lichen spp.	<i>Caloplaca parvula</i>	Smooth bark of young black ash in moist, humid old growth black ash stand	N	N	NI
A Lichen spp.	<i>Cetraria aurescens</i>	Conifer bark in lowland conifer swamps (old cedar/black spruce)	N	N	NI

A Lichen spp.	<i>Cladonia wainioi</i> (= <i>pseudorangiformis</i> )	On rock outcrops and thin soil – exposed sites with lots of light	N	N	NI
A Liverwort spp.	<i>Frullania selwyniana</i>	Lowland cedar swamps on bark of white cedar	N	N	NI
Port-hole Lichen	<i>Menegazzia terebrata</i>	Cedar swamps, especially old growth; base of cedar trees	N	N	NI
A Dog Lichen	<i>Peltigera venosa</i>	Soil and moist cliffs, exposed root wads.	N	N	NI
A Lichen spp.	<i>Pseudocyphellaria crocata</i>	Mossy rocks, trees in partially shaded, moist, frequently foggy habitats.	N	N	NI
A Lichen spp.	<i>Ramalina thrausta</i>	Cedar swamps, especially old growth	N	N	NI
A Lichen spp.	<i>Sticta fuliginosa</i>	On hardwoods in humid, old growth cedar or ash bogs	N	N	NI
A Lichen spp.	<i>Usnea longissima</i>	On old conifers in moist situations, often in or near a conifer or hardwood swamp	N	N	NI

