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Environmental Assessment

ATC ESE 6904 – 6905 Powerline Rebuild Project

**Hiawatha National Forest
St. Ignace Ranger District
Mackinac County, Michigan**



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Table of Contents

Chapter 1 – Purpose and Need for Action	1
1.1 Document Structure	1
1.2 Background	1
1.3 Purpose and Need for Action	4
1.4 Proposed Action	4
1.5 Decision Framework	4
1.6 Public Involvement	5
1.7 Issues	5
1.7.1 Visual Quality	5
1.7.2 Non-Native Invasive Plants	6
Chapter 2 – Alternatives, Including the Proposed Action	7
2.1 Introduction	7
2.2 Alternatives Considered in Detail	7
2.2.1 Proposed Action	7
2.2.2 Alternative 1 – No Action	14
2.3 Monitoring	15
2.4 Alternatives Considered but Eliminated from Detailed Study	15
2.4.1 Replacing the existing lines and structures in place	15
2.4.2 Routes diverging substantially from the existing ROW	16
2.4.3 Construction involving below-ground installation	17
2.5 Comparison of Alternatives	20
2.5.2 Comparison of Effects	20
Chapter 3 – Environmental Consequences	22
3.1 Introduction	22
3.2 Past, Present, and Reasonably Foreseeable Future Actions	22
3.3 Soils	26
3.3.1 Introduction	26
3.3.2 Analysis Methods	26
3.3.3 Analysis Areas	26
3.3.4 Affected Environment	27
3.3.5 Proposed Action	28
3.3.6 Alternative 1 – No Action	30
3.4 Hydrology/Watershed/Water Quality	31
3.4.1 Introduction	31
3.4.2 Analysis Methods	31
3.4.3 Analysis Areas	31
3.4.4 Affected Environment	32
3.4.5 Proposed Action	33
3.4.6 Alternative 1 – No Build	34
3.5 Wetlands	35
3.5.1 Introduction	35
3.5.2 Analysis Methods	35
3.5.3 Analysis Areas	35
3.5.4 Affected Environment	35

3.5.5 Proposed Action	37
3.5.6 No Action Alternative	39
3.6 Vegetation	40
3.6.1 Introduction	40
3.6.2 Analysis Methods	40
3.6.3 Analysis Areas	40
3.6.4 Affected Environment	40
3.6.5 Proposed Action	42
3.6.6 Alternative 1-No Action	46
3.7 Non-Native Invasive Plants	47
3.7.1 Introduction	47
3.7.2 Analysis Methods	47
3.7.3 Analysis Areas	47
3.7.4 Affected Environment	48
3.7.5 Proposed Action	48
3.7.6 Alternative 1-No Action	51
3.8 Threatened, Endangered, and Sensitive Species	52
3.8.1 Introduction	52
3.8.2 Analysis Methods	52
3.8.3 Analysis Areas	53
3.8.4 Affected Environment	53
3.8.5 Proposed Action	53
3.8.6 No Action Alternative	63
3.9 Terrestrial Management Indicator Species	64
3.9.1 Introduction	64
3.9.2 Analysis Methods	64
3.9.3 Analysis Areas	64
3.9.4 Affected Environment	65
3.9.5 Proposed Action	66
3.9.6 No Action Alternative	66
3.10 Fisheries, Aquatic Habitat, and Aquatic MIS	68
3.10.1 Introduction	68
3.10.2 Analysis Methods	68
3.10.3 Analysis Area	68
3.10.4 Affected Environment	68
3.10.5 Proposed Action	69
3.10.6 Alternative 1 - No Action	70
3.11 Recreation	72
3.11.1 Introduction	72
3.11.2 Analysis Methods	72
3.11.3 Analysis Areas	72
3.11.4 Affected Environment	72
3.11.5 Proposed Action	75
3.11.6 Alternative 1- No Action	77

3.12 Heritage Resources	78
3.12.1 Introduction	78
3.12.2 Analysis Methods	78
3.12.3 Analysis Areas	78
3.12.4 Affected Environment	79
3.12.5 Proposed Action	79
3.12.6 Alternative 1-No Action	79
3.13 Transportation	81
3.13.1 Introduction	81
3.13.2 Analysis Methods	81
3.13.3 Analysis Areas	81
3.13.4 Affected Environment	81
3.13.5 Proposed Action	82
3.13.6 Alternative 1- No Action	83
3.14 Visual Quality	84
3.16.1 Introduction	84
3.16.2 Analysis Methods	84
3.14.3 Analysis Areas	84
3.14.4 Affected Environment	84
3.14.5 Proposed Action	86
3.14.6 Alternative 1 – No Action	89
3.15 Socio-Economic Environment and Environmental Justice	91
3.15.1 Introduction	91
3.15.2 Analysis Methods	91
3.15.3 Analysis Area	92
3.15.4 Affected Environment	92
3.15.5 Proposed Action	95
3.15.6 Alternative 1 – No Action	96
3.16 Wild and Scenic Rivers	98
3.16.1 Introduction	98
3.16.2 Analysis Methods	98
3.16.3 Analysis Areas	98
3.16.4 Affected Environment	98
3.16.5 Proposed Action	100
3.16.6 Alternative 1	101
Chapter 4 – Consultation and Coordination	102
4.1 Agencies Consulted	102
4.1.1 Federal, State, and Local	102
4.1.2 Tribes	102
4.2 Persons Consulted	102
4.3 List of Preparers	102
4.4 References	103

List of Tables

Table 2.2-1. List of Forest Type by Management Area and acres that would be incorporated into the new ESE 6904-6905 corridor to allow for a rebuild to 138 kilovolts. Forested areas would be cleared for construction.....	8
Table 2.5-1 Comparison of Activities	20
Table 2.5-2. Comparison of Effects for Alternatives being considered for the ESE 6904-6905 Rebuild Project.....	21
Table 3.2-1. Summary of Past, Present, and Reasonably Foreseeable Actions within the Project Area Potentially Contributing to Cumulative Effects by Resource Area.	25
Table 3.3-1. HNF Existing 100-foot ROW - Drainage Class	27
Table 3.3-2. HNF New 80-foot ROW - Drainage Class	27
Table 3.3-3 HNF Existing 100-foot ROW - Slope Classes	28
Table 3.3-4. New HNF 80-foot ROW - Slope Classes.....	28
Table 3.4-1. List of Surface Water Features in HNF Crossed by the ESE 6904-6905 Transmission Line Corridor.	32
Table 3.5-1. List of Wetlands Crossed by the ESE 6904-6904 Survey Area (Existing and Proposed ROW) within the HNF	36
Table 3.5-2. List of Forested and Shrub-Dominated Wetland Areas That Would Be Converted To Herbaceous Cover on HNF	37
Table 3.5-3. List of Wetland Areas Within the Existing ROW, Adjacent to Forested or Shrub Wetlands That Would Be Abandoned and Allowed to Regenerate to Natural Vegetative Communities on HNF.....	38
Table 3.6-1. Management Areas (MAs) crossed by the ESE 6904-6905 Project Corridor within the HNF	41
Table 3.6-2. Old Growth Stands associated with the ATC ESE 6904-6905 Corridor and their approximate border length along the ROW	41
Table 3.6-3. List of compartments, stands, and acres that would be incorporated into the new ESE 6904-6905 corridor to allow for a rebuild to 138 kilovolts. Forested areas would be cleared for construction.	43
Table 3.6-4. Old Growth Stands along the ATC ESE 6904-6905 Corridor and effects of implementing the Proposed Action.....	45
Table 3.7-1. List of Forest Type by Management Area and acres that would be cleared for construction.	49

Table 3.8-1. Habitat Evaluation and Effects Determination for Federally Listed Threatened or Endangered Species with the Potential to Occur in Mackinac and/or Chippewa Counties, Michigan	54
Table 3.8-2. Habitat Evaluation and Effects Determination for Regional Forester Sensitive Species (Wildlife Species).....	55
Table 3.8-3. Habitat Evaluation and Effects Determination for Regional Forester Sensitive Species (Botanical Species).....	56
Table 3.10-1. List of ESE 6904-6905 Transmission Line Project TCSBs and Seasonal Restrictions.	70
Table 3.14-1. List of Viewpoints for the ATC ESE 6904-6905 ROW with VQO Classification and Dominant Landscape Characteristics.....	85
Table 3.15-1. Percent employment in Mackinac County, Chippewa County, and Michigan by category for 2000 as reported by the 2000 Census Bureau.....	92
Table 3.15-2. Family income in Mackinac County, Chippewa County, and Michigan as reported in the year 2000 Census	94
Table 3.15-3 Ethnicity Percents of Mackinac County, Chippewa County, and Michigan residents as reported in the year 2000 Census	94

List of Figures

Figure 1.2-1. General Location of the Proposed ESE 6904-6905 Rebuild Project, Mackinac and Chippewa Counties, Michigan.....	2
Figure 2.2-1. Depiction of Relative Alignments of Old and New Transmission Line Corridors....	9
Figure 2.4-1. Example of trenching for underground electric transmission line installation using trench boxes (ATC photo).	19
Figure 2.4-2. Example of trenching for underground electric transmission line installation without trench boxes (Dominion photo).	19
Figure 3.14-3. Rendering facing north showing existing poles (left) and an approximate configuration of the proposed steel poles (right). The first existing pole is structure #757, located about 1800 feet north of the terminus of Partyline Road.	86
Figure 3.15-1. Michigan commercial energy expenditures, 2005 calendar year.....	93
Figure 3.15-2. Michigan residential energy expenditures, 2005 calendar year.....	93

Appendices

Appendix A. Proposed Action Maps

Appendix B. Operation and Maintenance Plan (Proposed)

CHAPTER 1 – PURPOSE AND NEED FOR ACTION

1.1 Document Structure

The Hiawatha National Forest (HNF) has prepared this environmental assessment in compliance with the National Environmental Policy Act (NEPA) and other relevant federal and state laws and regulations. This environmental assessment discloses the direct, indirect, and cumulative environmental impacts that would result from the proposed action and alternatives. The document is organized into five parts:

Chapter 1 – Purpose and Need: This section includes information on the history of the project proposal, the purpose of and need for the project, and the agency's proposal for achieving that purpose and need. This section also details how the Forest Service informed the public of the proposal and how the public responded.

Chapter 2 – Alternatives, Including the Proposed Action: This section provides a detailed description of the agency's proposed action, as well as alternative methods for achieving the stated purpose. These alternatives were developed based on significant issues raised by the public and other agencies. This discussion also includes possible mitigation measures. Finally, this section provides summary tables of the alternatives and of the environmental consequences associated with each alternative.

Chapter 3 – Environmental Consequences: This section describes the environmental effects of implementing the proposed action and other alternatives. The analysis is organized by resource area. Within each section, the affected environment is described first, followed by the effects of each alternative. The No Action Alternative provides the baseline for evaluating and comparing the alternatives, including the proposed action.

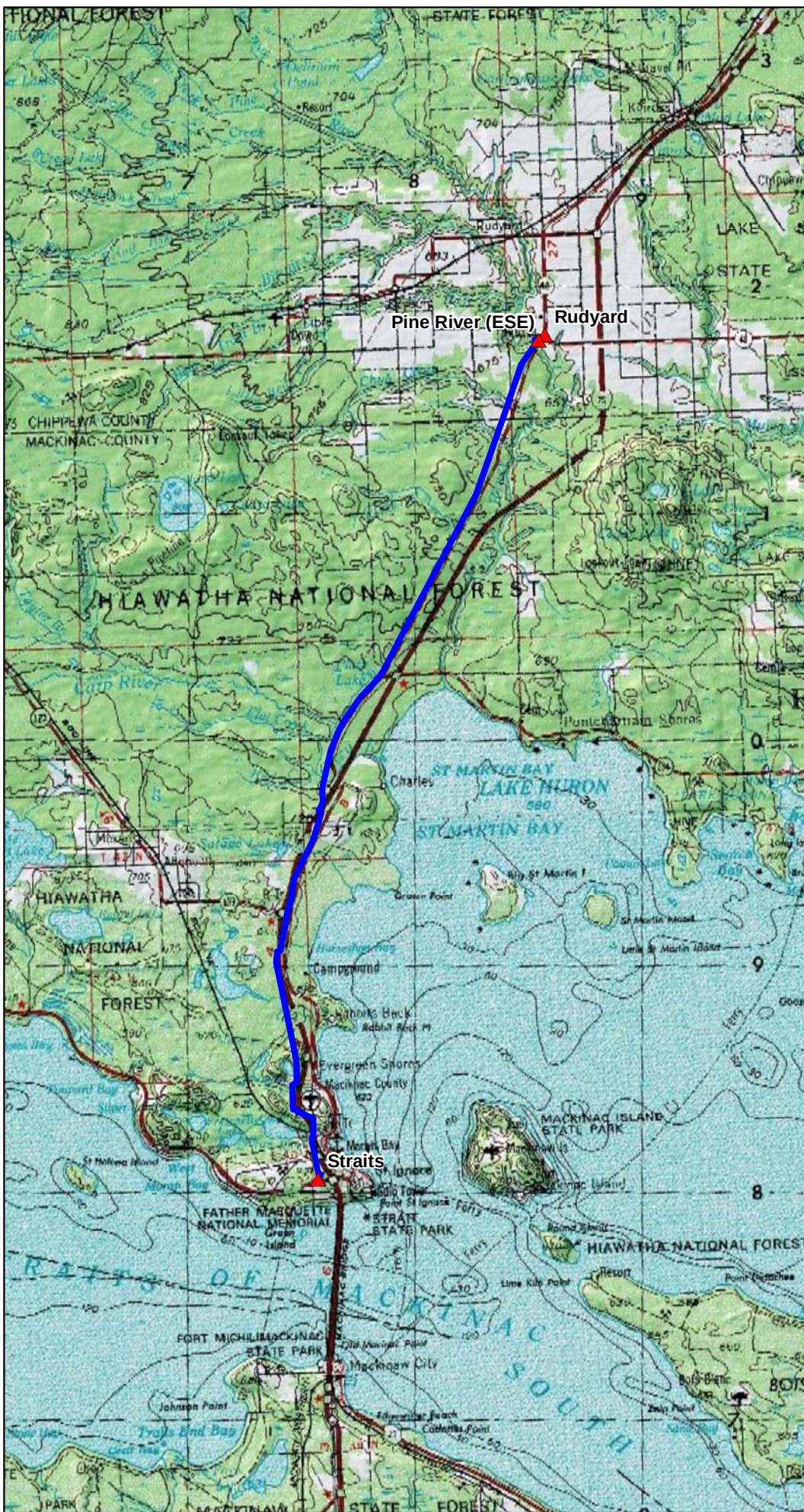
Chapter 4 – Consultation and Coordination: This section provides a list of agencies and individuals consulted during the development of the environmental assessment, as well as a list of preparers.

Appendices: The appendices provide detailed information to support the analyses in the presented in the environmental assessment.

Additional documentation, including detailed analyses of project-area resources, is in the project record at the St. Ignace Ranger District Office at W1900 West US-2, St. Ignace, MI 49781.

1.2 Background

The ATC Powerline Rebuild Project area runs along an existing approximately 100-foot wide electrical transmission corridor extending from the Straits substation at the intersection of West Spruce Road and South 2nd Street in St. Ignace, to the Pine River substation near the intersection of S. Mackinac Trail and Hwy 48 just north of the Pine River (Figure 1.2-1). The project corridor covers approximately 263.5 acres (100 feet wide by 21.7 miles long) in Mackinac and Chippewa counties. About 12.1 miles (146.9 acres) of the corridor run through lands managed by the HNF. The line operates at 69 kilovolt (kV) and is supported by approximately 395 double-circuit wood pole structures.



ATC ESE 6904 - 6905
Powerline Rebuild Project
Figure 1.2-1
Project Vicinity Map

June 2011

USGS 7.5' Topographic Quadrangle
Project Vicinity.mxd

0 4 Miles

Legend

- ▲ ATC Sites
- New Transmission Centerline

Base Map Data Sources: ATC, MIDNR, USGS
The information presented in this map document is advisory and is intended for reference purposes only. American Transmission Company owned and operated facility locations are approximate.



The existing 69 kV lines were constructed during the early 1930s. Most of the existing line equipment is from the original installation. The 1930s vintage conductors have very limited thermal capacity to carry both market flow and local delivery energy. The thermal capacity limitations are governed by National Electric Reliability Council (NERC) FA009.

Other conditions in the Eastern Upper Peninsula (UP) complicate this situation. Lake Superior water levels have subsided to near historic low levels (USACE 2011), reducing hydro-dam output. With the reduced hydro output, ATC standard operating protocol relies on the operation of expensive and less reliable diesel generation in the Eastern UP to help mitigate low voltages or overloaded lines during times of reduced hydro generation output.

The Ludington pumped-storage facility undergoes a wide daily range of generation output, either producing significant hydro generation during the day or absorbing large amounts of power at night when the plant goes into water storage pumping mode, causing large variances in UP power flows. The more consistent use of the Midwest Independent System Operator (MISO) market for regional power purchases has caused the power flows through the UP transmission system to become even more volatile.

The widely variable power flows across the Eastern UP, combined with the limited capacity of existing lines, present substantial operational concerns for ATC. Relatively small changes in load and generation can excessively stress portions of the existing transmission system and the system now experiences marginal low voltage risks during high load and market flow periods and marginally high voltages during low load periods.

To address line thermal capacity limits and manage voltage risks, ATC is frequently required to open switches to discontinue high power flows. Opening the switches splits UP distribution between the central and eastern areas and is referred to as “splitting the system”. Over the last three years, the frequency of splitting the system has changed from an abnormal operating condition to the normal operating condition. The action of splitting the system is at the direction of the MISO and ATC System Operations and is only done to prevent damage to ATC’s equipment. While this “splitting” protects ATC’s transmission system, it can also have impacts on electric distribution to its customers and local consumers. For example, normal operations use two diverse sources of power into the Eastern UP, one from the west through ATC’s transmission network and the second from the south through International Transmission Company’s (ITC) transmission system. When the system is split, the Eastern UP is only connected to ITC’s transmission system, reducing the reliability for all customers in the Eastern UP.

The ESE 6904-6905 lines are at their limits in terms of service and do not have the capacity to handle variable load growth, changing generation patterns, and any increase in demand within their service area. Because the lines do not have the capability to support growth in domestic consumption, industrial/commercial use, or local generation, in 2008, ATC initiated an Upper Peninsula Energy Collaborative (ATC 2009a). The objective of the collaborative was to identify maintenance and upgrade projects in the UP to meet various system planning, operation, asset renewal, and cost reduction objectives and to support projected increases in local demand and generation.

Through the collaborative, ATC worked with stakeholders including customers, environmental and municipal groups, regulators, the Midwest Independent Transmission System Operator, and neighboring transmission owners to evaluate transmission capacity and operation in light of projected changes in generation and demand over the next decade. In five of the six economic future scenarios, the collaborative team found that the ESE 6904-6905 lines would be inadequate to support demographic and economic growth. Only under the slow growth scenario with minimal change in population and economic activity would the existing lines remain serviceable. Even then, present operational constraints and service risks would persist.

1.3 Purpose and Need for Action

The purpose of the proposed project is to replace outdated 69 kV line equipment and upgrade it to be able to carry 138 kV in the future without additional work.

ATC is a public utility under the provisions of Section 205 of the Federal Power Act (16 USC 799, *et seq*) and provides transmission service under the provisions of the Federal Energy Regulatory Commission-approved (FERC) Open Access Transmission, Energy and Operating Reserve Markets Tariff (Tariff) of the Midwest Independent Transmission System Operator, Inc. (Midwest ISO), a FERC-approved and authorized regional transmission organization (RTO). The project proposed by ATC has been approved in the regional planning process of the Midwest ISO or is otherwise required in order to permit ATC to fulfill its obligations under the Federal Power Act and the Midwest ISO Tariff. Completing the project would allow the ESE 6904-6905 line to avoid low voltages and facility overloads under existing demand and to meet anticipated future power requirements for the Eastern UP.

Because the ESE 6904-6905 line provides electricity to a substantial portion of the Eastern UP and no alternate feed is available, there is also a need to complete the upgrade work without taking the existing line out of service or creating unsafe work conditions.

1.4 Proposed Action

The HNF proposes to amend ATC's special use permit to allow the company to complete the activities described below within the ATC ESE 6904-6905 Powerline Rebuild Project area (See maps in Appendix A). The line would initially be operated at 69 kV with the ability to shift to 138 kV in the future as regional electricity demand increases.

The rebuild construction time frame is expected to take 12 to 15 months beginning in the fall of 2012. The new line would be managed using ATC's established operation and maintenance practices, in consultation with HNF staff in order to maintain the lines in a manner consistent with Forest Plan guidelines.

A detailed description of the Proposed Action is provided in Section 2.2.1.

1.5 Decision Framework

The Forest Supervisor of the HNF will make the following decisions based on the interdisciplinary analysis:

- Whether an EIS is needed. If an EIS is not needed, the responsible official will issue a decision notice and finding of no significant impact.
- Whether the proposed activities and alternatives respond to the issues, implement Forest Plan direction, and meet the purpose and need for the project.
- Whether the proposed action, portions of the proposed action (modified), or the no action alternative will be selected.
- Which if any design criteria, mitigation measure(s) and/or monitoring will be required.

1.6 Public Involvement

The proposal was listed in the Schedule of Proposed Actions on October 1, 2009. The proposal was provided to the public, other agencies, and tribal representatives for comment during a scoping period running from May 19, 2010 through June 25, 2010.

In addition, the agency held two open houses. The first in Rudyard, MI on June 9 (about 10 people attended) and the second in St. Ignace, MI on June 10 (about 30 people attended). Comments were collected at each open house.

Thirteen written comments were received from eleven different individuals, organizations, and agencies. Using these comments, the interdisciplinary team (IDT) developed a list of issues.

1.7 Issues

Comments from the public and other agencies about the proposed action were used to formulate issues. The IDT separated the issues into two groups: significant and non-significant issues. Significant issues are those directly or indirectly caused by implementing the proposed action. Non-significant issues are those: 1) beyond the scope of the proposed action; 2) already decided by law, regulation, policy, Forest Plan, or other higher level decision; 3) irrelevant to the decision to be made; 4) conjectural or not supported by scientific or factual evidence. The Council for Environmental Quality NEPA regulations requires this delineation in section 1501.7, "...identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (Sec. 1506.3)..." A list of non-significant issues and reasons regarding their categorization as non-significant may be found in the public involvement section of the project record. The IDT identified two significant issues:

1.7.1 Visual Quality

The additional clearing and installation of steel poles would result in degradation of visual quality in areas along the transmission corridor.

This issue is addressed in the analysis of effects.

Issue indicator(s): changes in landscape form, line, color, and texture and consistency with the HNF Visual Quality Objectives.

1.7.2 Non-Native Invasive Plants

The additional clearing and associated construction activities would promote the spread of non-native invasive plants.

This issue is addressed with the development of design criteria and in the analysis of effects.

Issue indicator(s): area of potential soil disturbance not protected through design criteria and/or best management practices.

CHAPTER 2 – ALTERNATIVES, INCLUDING THE PROPOSED ACTION

2.1 Introduction

This chapter describes and compares the alternatives considered for the ATC ESE 6904-6905 Powerline Rebuild Project. It includes a description and map of each alternative considered. This section also presents the alternatives in comparative form, sharply defining the differences between each alternative and providing a clear basis for choice among options by the decision maker and the public. Some of the information used to compare the alternatives is based upon the design of the alternative and some of the information is based upon the environmental, social, and economic effects of implementing each alternative.

2.2 Alternatives Considered in Detail

The following section describes in detail the proposed action and no action alternative.

2.2.1 Proposed Action

The Forest Service proposes to amend ATC's special use permit to allow the company to rebuild the existing 69 kV ESE 6904-6905 transmission line to carry 138 kV to support existing and anticipated future power requirements for the Eastern UP (Appendix A). The line would initially be operated at 69 kV with the ability to shift to 138 kV in the future as regional electricity demand increases. The rebuild would begin in the fall of 2012 and last 12-15 months.

Prior to construction, the contractor would establish staging areas and mobilize heavy equipment. All construction staging areas would be established off National Forest lands.

In order to upgrade the line, ATC would construct a new line within the existing cleared corridor offset about 30 feet west of the existing line, except in areas of sensitive habitat where the routing may run east of the existing line. Creating the offset would require approximately 20 feet of additional corridor on the side of the offset. Table 2.2-1 summarizes the impact of the new right-of-way (ROW) by Management Area (MA) and forest type. Approximately 40 feet along the ROW on the opposite side from the offset would be abandoned and removed from the area in ATC's special use permit. The resulting corridor would be 80 feet wide (ATC 2009b), rather than the existing 100 feet (Figure 2.2-1).

Table 2.2-1. List of Forest Type by Management Area and acres that would be incorporated into the new ESE 6904-6905 corridor to allow for a rebuild to 138 kilovolts. Forested areas would be cleared for construction.

MA	Forest Type	Acres
1.2	White Cedar	0.9
1.2	White Cedar - Aspen - Paper Birch	0.7
1.2	Quaking Aspen	1.9
1.2	Non-Forested	1.8
4.5	White Cedar	1.6
4.5	White Cedar - Aspen - Paper Birch	2.8
4.5	Quaking Aspen	1.4
4.5	Non-Forested	3.4
6.4	Red Pine	0.2
6.4	White Cedar	2.7
6.4	Swamp Conifer	3.2
6.4	Red Maple - wet site	<0.1
6.4	Aspen - White Spruce - Balsam Fir	0.6
6.4	Lowland Shrubs	0.7
6.4	Non-Forested	7.8
8.4.2	Black Spruce	0.1
8.4.2	Paper Birch	0.2
8.4.2	Aspen - White Spruce - Balsam Fir	0.3
8.4.2	Non-Forested	2.1
Total		32.5

NOTE: These acres were calculated by GIS. The actual acres may vary slightly

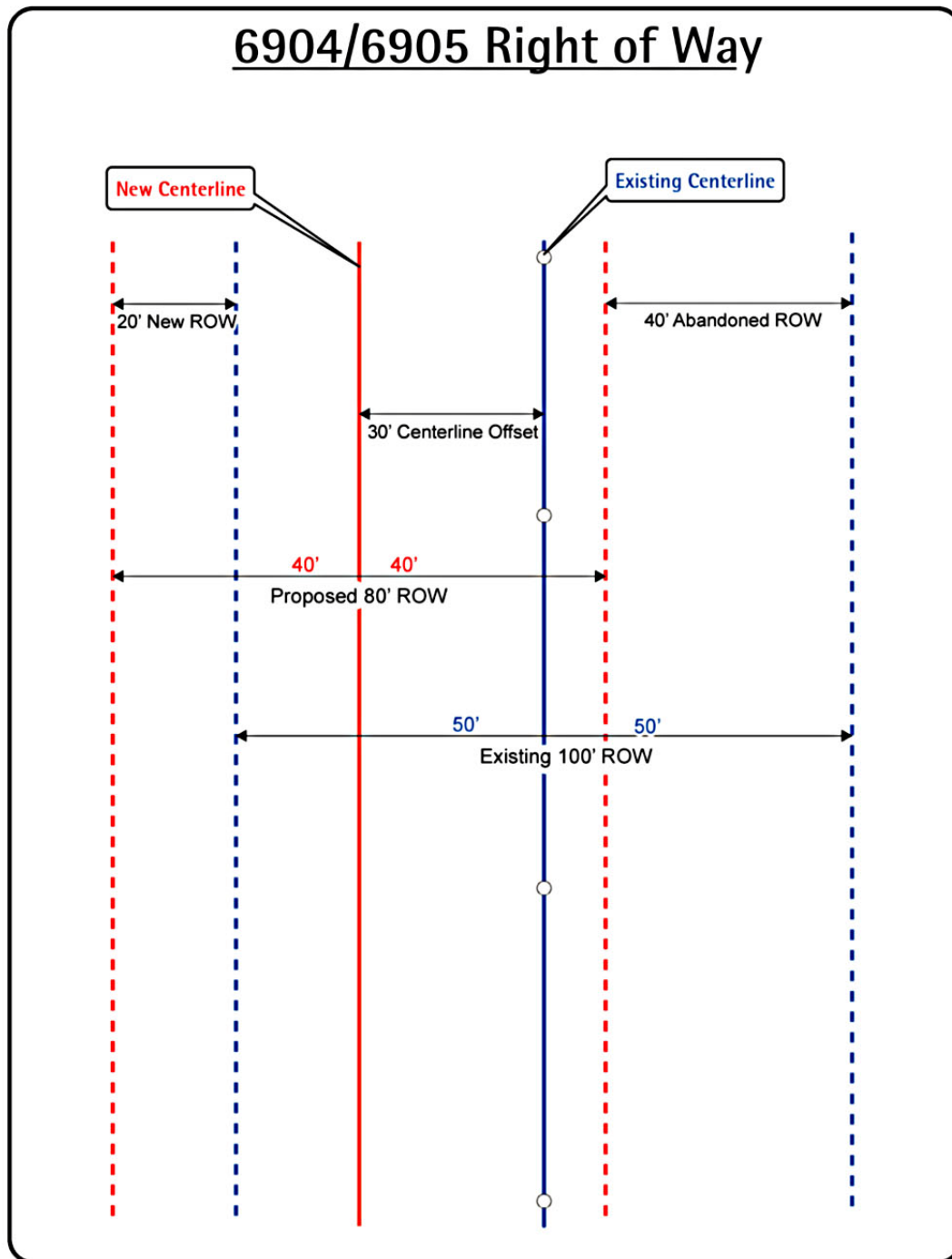


Figure 2.2-1. Depiction of Relative Alignments of Old and New Transmission Line Corridors.

Most areas that are forested or shrub covered would be cleared for construction and subsequently maintained as herbaceous or shrub habitat while the line is in operation.

Once the right-of-way is cleared, the following are typical steps taken in construction:

1. Framing and setting poles
2. Rope and wire pulling
3. Sagging and clipping conductors.

Framing and setting consists of erecting structures, including foundations and guys (where needed). In this case, the new line would be carried by approximately 225 double-circuit steel poles. The poles would generally be direct embed structures, but some poles where the lines change direction (angle structures) may have foundations or guys.

In locations where poles would be direct embed structures, a hole is drilled to the depth required by the length and type of pole. If the soil conditions require, split barrels or culvert pipes are placed vertically in the hole and used to hold the hole open until the pole is in place. These holes typically range from about 3 to 5 feet in diameter and from about 10 to 20 feet deep. The pole is then lifted into place with a crane and set in the hole. Crushed stone is used to fill the space in the hole and/or culvert and is compacted. Topsoil material excavated from the hole is placed around the base of the pole on top of the crushed stone.

In locations where poles require a foundation, a shaft is drilled which may or may not be cased. A reinforcing bar cage is then installed into the shaft and supported. An anchor bolt cage is then installed into the shaft and supported. If the casing is temporary, it would be removed during the concrete pour. The exposed portion of the foundation (typically 12-24 inches above grade) is formed and finished. The concrete foundation would be dewatered as necessary and allowed sufficient time to cure and gain the required strength. The pole is then lifted into place with a crane and set on the foundation. Foundations for double-circuit structures typically range from 6 to 12 feet in diameter and 20 to 40 feet deep.

The new poles would be similar to the existing poles, but would be 20-25 feet taller to meet clearance requirements of the higher voltage and a brown color rather than weathered gray. The additional height allows a wider pole spacing and fewer poles.

Once the structures are secure, ropes are used to pull the conductors and shield wires into place. Once all the conductors and shield wires are in place, they are brought up to final sag and clipped into the conductor clamps.

Installation of the poles and wires would require approximately 43 access points on National Forest lands, located across existing forest roads. Some access points would need branch trimming to allow equipment travel. Access points would be located to avoid, as much as possible, the need for wetland and/or stream crossings. Where wetland and/or stream crossings cannot be avoided, mats, clear span bridges, and best management practices (BMPs) as outlined in the design criteria would be implemented in order to avoid or minimize construction impacts.

Once construction is completed, the new line would be energized, the old line would be taken out of service, and the old poles, wires, and other equipment would be removed. Both above and below-ground portions of the old poles would be removed, except in sensitive areas such as Hines emerald dragonfly habitat and buffers as noted in the Design Criteria (Section 2.2.1.1).

Areas within the old corridor that are not needed for operation of the new line (approximately 40 feet, generally to the east) would be allowed to revegetate naturally. Access points expanded for construction and other areas identified by the HNF as out of compliance with the Forest Plan would be blocked with gates, boulders or berms. The method of closure would be determined based upon on-ground conditions at each location.

If the HNF decides to allow ATC to proceed with the ESE 6904-6905 project within the National Forest, the Forest Service will need to amend ATC's existing special use permit in order to implement the decision.

2.2.1.1 Design Criteria

The following design criteria have been developed as part of the proposal in order to reduce or avoid impacts.

Riparian and Water Body Protection

1. Wherever possible, avoid ground-disturbing activities within intermittent and perennial stream valleys. When this is not possible, stream valleys would be completely spanned by the transmission line and vegetative disturbance limited to the minimum required to maintain safe clearance between the transmission lines and poles.
2. Ground disturbance within riparian areas would be kept at least 100 feet from water bodies or as otherwise recommended by Michigan Department of Natural Resources and Environment (MDNRE) BMPs based on slope and other considerations. Use filter fencing and other mitigations recommended by Michigan BMPs to minimize risk of erosion.
3. Necessary ground disturbance within recommended buffer zones would be scheduled to occur during stable conditions (dry weather, winter) or on mats and for the shortest time period possible. Seed and mulch, or appropriate erosion matting would be applied immediately after ground-disturbing activities have been completed. Seed mixes would consist of native species approved by a Forest Service botanist.
4. Wherever possible, maintain woody vegetation (alder and other shrubs) within 100 feet of streams to provide shade and a future source of woody debris. Avoid disturbance of groundwater seeps and springs.
5. Winter construction would be considered within riparian areas where it would minimize soil disturbance and risk of erosion.
6. Heavy equipment would not cross any stream course except on temporary, clear span bridges unless approved by a Forest Service aquatic resources specialist on a case-by-case basis.

Wildlife

1. Implement current goshawk and red-shouldered hawk conservation measures (Piehler 2006) and bald eagle management guidelines (USFWS 2007) when and if necessary.
2. Minimize soil and water disturbance within and around RFSS snail locations by limiting access around habitat (winter restrictions at some sites) and confining equipment to designated trails.
3. Hine's emerald dragonfly (HED):
 - a. All construction operations within delineated wetlands containing HED larval habitat would occur after compacted snowfall, normally December 1 to February 28.
 - b. Tree removal in and within 100 feet of HED larval habitat would be done by hand (chainsaws) and during seasonal restrictions mentioned in criterion "a" above. All cut trees and shrubs must be removed from the project area or placed away from larval habitat and the 100-foot buffer.
 - c. New power poles would be located outside of HED larval habitat and the 100-foot buffer whenever possible. Pole numbers 123466, 123467, 123505, 123506, 123513, 123515, 123521, and 123537 would be located within the 100-foot buffer.
 - d. Placement of new power poles would be used to minimize the need for equipment crossing HED larval habitat (i.e. span over larval habitat to eliminate crossing during construction and future maintenance).
 - e. If equipment must cross HED larval habitat, mats, bridges, and other options would be utilized to avoid or decrease disturbance, consistent with the riparian and waterbody design criteria. Construction equipment would cross larval habitat between the following spans: 123467-123468, 123494-123495, 123509-123510, and 123523-123524.
 - f. Within and adjacent to the 100-foot buffer around HED larval habitat, barriers (i.e. orange snowfence) would be utilized to ensure these areas are readily observable and known to all personnel. This will reduce access and damage by personnel and equipment. Construction equipment would access the following spans through larval habitat buffer areas: 123466-123468, 123494-123495, 123498-123499, 123503-123507, 123509-123510, 123512-123516, 123521-123524, and 123536-12353.
 - g. Old pole removal in and within 100 feet of HED larval habitat would be done by hand (chainsaws) and during seasonal restrictions mentioned in criterion "a" above.
 - h. Emergency maintenance requiring immediate access into HED larval habitat or the 100-foot buffer would require notification of HNF staff and consultation with US Fish and Wildlife Service (FWS) personnel within 24 hours after the situation is identified. HNF and FWS personnel expect the design criteria for HED habitat protection (a through h above) would be followed during emergency maintenance to the extent possible.
 - i. Project implementation could be subject to additional conservation measures resulting from required consultation between HNF and FWS personnel (e.g. protection of foraging

habitat, access to line, etc.).

Plants and Non-Native Invasive Species (NNIS)

1. Protect the federally threatened plant, Houghton's goldenrod, on National Forest System lands by delineating a 100-foot buffer around each location where land disturbance would be avoided or minimized, and where vegetation removal would be restricted to hand cutting (e.g. chainsaws) during the period of plant dormancy. All cut trees and shrubs must be removed and scattered away from the plant occurrence and the 100-foot buffer. If equipment must cross a Houghton's goldenrod buffer, mats, bridges, and other options would be utilized to avoid or decrease disturbance. Construction equipment would access the following span through a Houghton's goldenrod buffer area located on National Forest System lands: 123523-123524.
2. Within and adjacent to the 100-foot buffer around a Houghton's goldenrod occurrence (or other threatened and endangered plant species), barriers (e.g. orange snowfence) would be utilized to ensure these areas are readily observable and known to all personnel. This would reduce access and damage by personnel and equipment. Construction equipment would access the following span through a Houghton's goldenrod buffer area located on National Forest System lands: 123523-123524.
3. New power poles would be located outside of Houghton's goldenrod occurrences and the 100-foot buffer whenever possible. Construction equipment would access the following span through a Houghton's goldenrod buffer area located on National Forest System lands: 123523-123524
4. Old pole removal in and within 100 feet of a Houghton's goldenrod occurrence would be done by hand (chainsaws) and during the period of plant dormancy.
5. Emergency maintenance requiring immediate access into Houghton's goldenrod habitat or buffer would require consultation with HNF and FWS personnel within 24 hours after the situation is identified. HNF and FWS personnel expect the design criteria for plant protection would be followed during emergency maintenance to the extent possible.
6. Equipment cleaning provisions will be utilized during construction and maintenance activities to help ensure NNIS are not spread into project areas.
7. Project implementation could be subject to additional conservation measures resulting from required consultation between HNF and FWS personnel (e.g. protection of foraging habitat, access to line, removal of old poles, etc.).
8. Protect RFSS plants by delineating a 100-foot buffer around each location where land disturbance would be minimized or avoided and where vegetation cutting would be restricted to hand cutting (e.g. chainsaws) during the period of plant dormancy. Species located within National Forest System lands include limestone oak fern (*Gymnocarpium robertianum*) and mat muhly (*Muhlenbergia richardsonis*). Construction equipment would access the following spans through limestone oak fern buffer areas: 123608-123609 and 123611-123613 and mat muhly buffer area: 123524-123525.
9. Protect any new threatened, endangered, and sensitive (TES) plant locations that may be

found during implementation using appropriate reserve areas. Protection measures for TES plants would be established on a case-by-case basis by HNF personnel.

10. To reduce the spread or introduction of NNIS, certified weed-free gravel would be used.
11. To reduce the introduction of NNIS, straw mulch or certified, weed-free hay mulch would be used.

Recreation

1. Snowmobile Trail
 - a. From December 2 to March 31, place warning signs as defined in the traffic control plan (e.g. "Plowed Road Ahead" and "Utility Construction Ahead") along the section of the powerline right-of-way that contains the trail to alert snowmobilers of the presence of these activities.
 - b. Where a designated trail crosses a plowed road, operators will slope snowbanks to allow snowmobilers safe access to the plowed portion of the road. The project manager will remind workers of snowmobile presence and the need for safe speeds and extra awareness along the powerline.
2. Campgrounds
 - a. Construction activities will not occur adjacent to Carp River Campground between Memorial Day weekend and Labor Day weekend, which is when the highest recreation visitation occurs, to reduce the number of visitors impacted by the construction activities.
3. Access Points
 - a. New access to the powerline corridor from Forest Service Roads will be blocked with gates, boulders or berms. The method of closure will be determined based on the on-ground conditions.
 - b. New access to the powerline corridor onto National Forest System Lands from private lands will be blocked with gates, boulders or berms. The method of closure will be determined based on the on-ground conditions.

Operation and Maintenance Plan

The new line would continue to be operated and maintained in a manner consistent with present Forest Plan direction. In conjunction with amending ATC's special use permit for the ESE 6904-6905 lines, the Forest Service would formalize post-construction activities along the corridor through implementation of a new Operation and Maintenance Plan (O&M Plan). The new O&M Plan would include a description of different habitat areas, procedures for communication between ATC and the Forest Service, and stipulations for how O&M activities would be carried out in order to protect National Forest resources (Appendix B).

2.2.2 Alternative 1 – No Action

Under Alternative 1, the Forest Service would not approve upgrading the ESE 6904-6905 line equipment, modification to the ROW location, an amended special use permit, or a new O&M Plan. The existing line and equipment would remain in service and would be managed using informal operation and maintenance practices in consultation with HNF staff. Under this

alternative, new poles, cross members, and associated equipment would be installed on an as-needed basis using existing maintenance procedures. Over the remainder of the existing special use permit, ATC anticipates these maintenance activities would affect $\frac{1}{3}$ to $\frac{1}{2}$ of the corridor on the HNF. In addition, the current 2 to 4 year vegetation management (cutting and/or mowing) cycle would continue to maintain the existing 100 foot wide ROW.

2.3 Monitoring

Beginning the growing season following the completion of construction and continuing for a period of 3-5 years, the following areas within the project corridor on the HNF would be monitored annually:

- Areas disturbed by construction
- TES occurrences or habitat
- Areas of NNIS

2.4 Alternatives Considered but Eliminated from Detailed Study

NEPA requires federal officials to explore and evaluate all reasonable alternatives and to briefly discuss the reasons for eliminating any alternatives that were not developed in detail. The range of alternatives considered reasonable is primarily limited by the requirement to fulfill the Purpose and Need for Action. To be reasonable, an alternative must also bring about the ends of the federal action in a manner that is practical or feasible from the technical and economic standpoint and using common sense, rather than simply being desirable (40 CFR 1502.14).

A brief discussion of each alternative considered but eliminated from detailed study, as well as the reasons for their elimination is provided below.

2.4.1 Replacing the existing lines and structures in place

Several individuals who commented on the project asked whether the proposed 30-foot offset was necessary and/or if it were possible to reduce the project footprint. ATC evaluated these questions early in project design and made the following determinations:

- Because the ESE 6904-6905 line is the only transmission line providing electricity to its service area, taking it out of service would cut off electricity to a large portion of the Eastern UP until construction could be completed.
- Since a service outage is not acceptable, replacing the lines in place would require working within the space occupied by the energized wires.
- Working within energized lines with equipment would be a violation of US Occupational Safety and Health Administration regulations. OSHA regulations for overhead powerline

construction specify a minimum distance of 11 feet when working near energized 69 kV transmission lines [29 CFR 1926.550(a)(15)(ii)]:

For lines rated over 50 kV., minimum clearance between the lines and any part of the crane or load shall be 10 feet plus 0.4 inch for each 1 kV. over 50 kV., or twice the length of the line insulator, but never less than 10 feet;

The arms on the existing poles hold the lines out about five feet. Adding the 11 feet clearance requirement places the edge of the OSHA safety buffer approximately 16 feet from the poles. The arms on the new poles would extend out approximately 6.5 feet. Thus, with a 30-foot pole offset, there is 7.5 feet of safe work space for installation of the new wires. ATC believes that, given the existing corridor conditions, 7.5 feet is the minimum workspace necessary in order to install the new lines without encroaching into the OSHA-established safety buffer and placing workers at risk.

Because the line cannot be taken out of service, and working around the energized wires would be a safety violation, an in-place rebuild or reducing the pole offset from 30 feet were not considered feasible and eliminated from detailed study.

2.4.2 Routes diverging substantially from the existing ROW

Some commenters suggested routing variations outside the existing corridor. For example, move the line to run along existing infrastructure (specifically Mackinac Trail and/or I-75) rather than across National Forest Land. These suggestions would constitute a new corridor adjacent to the referenced existing infrastructure and thus did not meet the purpose and need of transmission line upgrade as a replacement.

Any alternative along Mackinac Trail or I-75 would require cutting a new right-of-way through some National Forest System lands, establishing new access roads, and crossing additional wetlands and other sensitive habitats, as well as acquiring new easements across private lands. The typical 138 kV transmission line ROW is at least 80 feet wide (ATC 2009b). Depending on how much of the existing road corridor was previously cleared, a new transmission line ROW adjacent to an existing road corridor would require between 40 feet and 80 feet of new ROW / clearing. If the transmission line centerline was at the edge the existing road ROW / clearing, 40 feet of clearing would be required. If the entire road ROW was not previously cleared, a transmission ROW may require up to the full 80 feet of new clearing.

The Michigan Department of Transportation (MDOT) would not permit direct construction access on and off of I-75 for the proposed action or other alternative. New access roads from Mackinac Trail or other roads would be required for a new corridor adjacent to I-75.

A preliminary evaluation of a corridor adjacent to Mackinac Trail was completed (map in project record). Horseshoe Bay Wilderness Area is located immediately east of Mackinac Trail. Therefore, the west side of Mackinac Trail was evaluated. A new route along the west side of Mackinac Trail, from Lant Road north to the Pine River substation, including a short segment along the west side of Lant Road, would cross approximately 10.8 miles of HNF. This route

would require between approximately 51 acres and 102 acres of new ROW / clearing based on 40 foot wide and 80 foot wide new ROW / clearing, respectively. There are many private property inholdings along Mackinac Trail. Most of the homes on the private inholdings are located between Mackinac Trail and the existing transmission line. Rebuilding the transmission line along Mackinac Trail would remove much the screening in the front yards of the homes, between homes and Mackinac Trail. The exiting transmission line ROW is located behind most of the homes (west of the homes).

Visual quality was one of the significant issues identified during the public scoping period. In most areas, the existing transmission line corridor is screened from nearby parallel roads (I-75 and Mackinac Trail) by forest vegetation; whereas a new corridor adjacent to Mackinac Trail or I-75 would have no screening. In addition, Forest-wide management direction states that “Roads and utility distribution systems should be located within existing corridors where possible.” (USDA 2006a, P 2-21)

Given the purpose and need of transmission line replacement; the issues identified during the public scoping; the Forest Plan direction to follow existing corridors where possible; the projected increased environmental damage from new routing; the increased visual impact of a new transmission line adjacent to a road corridor; and the fact that new corridors would affect numerous parcels of private land, alternatives other than those associated with replacement within/adjacent to the existing ROW corridor were deemed not practical or feasible and eliminated from detailed study.

2.4.3 Construction involving below-ground installation

One individual who commented on the project noted that Forest-wide management direction states that, “new construction, upgrades and replacement of existing utility distribution lines should be buried where possible” and requested that ATC build the new line underground along existing roads (e.g. Mackinac Trail and/or I-75).

Below-ground installation was evaluated for the ESE 6904-6905 rebuild. However:

- Environmental impacts associated with underground transmission cable installation and maintenance can be significantly greater than those of overhead transmission line construction and maintenance (EPRI 2008, p. vi). Except in exceptional circumstances or for short distances, the conduit cannot be drilled in like a fiber-optic cable or pipeline. Rather, it is open-trenched, requiring excavation along the entire line corridor (Figure 2.4-1).
- Activities associated with underground transmission projects have a greater potential to negatively affect surface flow and flood plains, wetlands, groundwater, and water quality than overhead transmission line projects (EPRI 2008, p. A-3).
- Transformers placed underground require excavation of large pits unlike above-ground installation that does not require excavation except for the towers (Figure 2.4-2).
- Underground transformers also generally have much shorter service lives than above-ground transformers because the need to circulate air around them also makes them more vulnerable to rusting and other corrosion. This increases maintenance costs.

- Visual inspection of an underground transmission line is limited to what is readily visible above ground or in manholes. Any required maintenance would be more difficult, costly, time consuming, and environmentally damaging due to the need for excavation.
- Maintenance and operations of underground transmission lines have a greater chance of negatively affecting soil temperature, contamination, compaction, and erosion potential, than overhead transmission projects (EPRI 2008, p. A-4).
- Repairing underground lines is more complex and costly than repairing overhead lines, typically requiring excavation of corridor segments in order to expose the area requiring maintenance. Leaking insulation fluid can affect soil and water quality and is considered hazardous waste. “Costs associated with these [cleanup] activities can rapidly escalate because of the diffusive nature of the dielectric fluids, especially in water” (EPRI 2008, p. 5-20).
- Underground installation is more expensive, since the cost of burying cables at transmission voltages is many times greater than overhead power lines and creates more complex switching and control needs. ATC completed a comparative design and cost estimate for burying the ESE 6904-6904 lines within the HNF. Based on those calculations, burying the line would cost a minimum of 110 million dollars in comparison to 36 million for the proposed above-ground rebuild.



Figure 2.4-1. Example of trenching for underground electric transmission line installation using trench boxes (ATC photo).



Figure 2.4-2. Example of trenching for underground electric transmission line installation without trench boxes (Dominion)

Underground lines are considerably more costly and environmentally invasive (from trenching and underground facility installation) than overhead lines. In this case, it would require trenching through a Wild and Scenic River corridor, federally-listed critical habitat, and wetlands with known occurrences of federally-listed species. For these reasons, alternatives involving underground installation were not considered practical or reasonable from a cost and resource protection standpoint and eliminated from more detailed study.

2.5 Comparison of Alternatives

Information in Table 2.5-1 compares the activities associated with the Proposed Action and the No Action Alternative.

Table 2.5-1 Comparison of Activities

Activity	Proposed Action	Alternative 1: No Action
Total Number of Structures	156	203
Number of New Structures	156	67 - 102 ¹
Number of Structures Removed	203	67 - 102 ¹
Number of Access Points	31	31 ²
Number of Waterways Crossed with Clear Span Bridges	10	10 ²
Acres of New ROW Clearing Required	32.5	0
Acres of maintained corridor	128.2	154.0
Transmission Service Capacity	138 kV	69 kV

¹ ATC estimates that 1/3 to 1/2 of the structures would need to be replaced during maintenance over the remainder of the existing special use permit.

² Assumes that all access points and TCSB would be utilized for maintenance (vegetation management and/or pole repair/ replacement) at some time during the remainder of the existing special use permit.

2.5.2 Comparison of Effects

Information in Table 2.5-2 compares the Effects associated with the Proposed Action and the No Action Alternative.

Table 2.5-2. Comparison of Effects for Alternatives being considered for the ESE 6904-6905 Rebuild Project

Activity	Proposed Action	Alternative 1: No Action
Soils	Excavation for new structures. ±19.6 acres of soil affected by access.	Access for maintenance to repair or replace existing poles as needed ¹ .
Hydrology/Watershed/ Water Quality	No direct effects. TCSB crossings of 10 waterways. 10 structures installed in riparian buffers. 15 structures removed from riparian buffers.	No direct effects. Maintenance to repair or replace existing poles as needed ¹ .
Wetlands	Installation of new structures in wetlands. Conversion of 24.6 acres of forested or shrub wetland to herbaceous wetland. Abandonment / regeneration of 39.1 acres of forested or shrub wetland.	Maintenance to repair or replace existing poles in wetlands as needed ¹ . No changes to wetland type.
Vegetation	Clearing for 20 feet of new ROW. 40 feet of ROW abandonment / regeneration. ±19.6 acres of vegetation affected by access. O&M vegetation management (mowing) 1.6 acres within Old Growth stands cut, 6.6 acres of abandoned ROW to regenerate within Old Growth stands.	No changes to the ROW width. Access for maintenance to repair or replace existing poles as needed ¹ . O&M vegetation management (mowing)
Non-Native Invasive Species	Clearing for 20 feet of new ROW. 40 feet of ROW abandonment / regeneration. ±19.6 acres of vegetation affected by access.	No changes to the ROW width. Access for maintenance to repair or replace existing poles as needed.
Threatened, Endangered, and Sensitive Species	Potential direct and indirect effects to RFSS land snail, insect and turtle species. Potential indirect effects to other RFSS species and federal species.	No effect beyond current ROW management practices.
Terrestrial Management Indicator Species	Temporary effects to habitat associated with new ROW and ROW abandonment.	No effect.
Fisheries, Aquatic Habitat, and Aquatic MIS	No direct effects. TCSB crossings of 10 waterways.	No direct effects. Maintenance to repair or replace existing poles as needed ¹ .
Recreation	Temporary effects due to construction traffic and noise. Temporary access restriction in work zones for safety.	No effect beyond current ROW management practices.
Heritage Resources	One site identified. No direct or indirect effects.	No direct or indirect effects.
Transportation	Temporary effects during construction. No new access points would be created.	No effect beyond current ROW management practices.
Visual Quality	Poles taller, farther apart, brown rather than weathered gray. ROW temporarily wider until abandoned ROW re-grows.	No effect.
Socio-Economic Environment and Environmental Justice	Capacity to support growth, less interruptions. ±20 full time jobs during construction.	Increased outages. line not able to handle increased demand. Routine maintenance – no additional construction jobs.
Wild and Scenic Rivers	The project would not impede the free-flowing status of the Wild and Scenic River. It would not change the classification, nor would it diminish the outstandingly remarkable values.	No effect.

¹ ATC estimates that 1/3 to 1/2 of the structures would need to be replaced during maintenance over the remainder of the existing special use permit.

CHAPTER 3 – ENVIRONMENTAL CONSEQUENCES

3.1 Introduction

This chapter describes aspects of the physical, biological, social, and economic environments likely to be affected by the proposed action and alternatives. It also discloses the direct, indirect, and cumulative effects that would result from implementing any of the alternatives. Together, these descriptions form the scientific and analytical basis for the comparison of effects in Chapter 2, section 2.5.2.

3.2 Past, Present, and Reasonably Foreseeable Future Actions

The Council on Environmental Quality has defined cumulative impact as "...the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such actions" (40 CFR 1508.7).

Seven projects involving the National Forest, one large-scale industrial development, and three sets of activities associated with other agencies, ATC, or private landowners were identified as being of a nature or in a location that could lead to cumulative effects when combined with the ESE 6904-6905 rebuild (Appendix D, Figure D-1, Table 3.2-1). Six of the projects involving the National Forest have been approved and one has been proposed and is under evaluation. The large-scale industrial development is under review by the Department of Energy. The other agency and landowner activities have not been specifically proposed but have been projected to occur over time.

Red Creek Trail Project – The Red Creek Trail Project involved relocation of 3.3 miles of the Red Creek Snowmobile Trail and construction of two parking areas. A portion of the trail relocation included extending the trail along the ESE 6904-6905 corridor north approximately 1.6 miles from the intersection of Mackinac Trail and M-134 (USDA 2003). The project has been completed.

Rudyard Project – The Rudyard project involved timber harvest and associated activities on approximately 9,000 acres of National Forest lands. Approximately 4,378 acres of Rudyard Project activities fall within watersheds crossed by the ESE 6904-6905 rebuild (USDA 2001). The project has been completed.

Niagara Project – The Niagara Project has been approved and involves timber harvest and associated activities on approximately 4,215 acres of National Forest lands (USDA 2009). Approximately 1,674 acres of Niagara Project activities fall within watersheds crossed by the ESE 6904-6905 rebuild. Implementation of the project began in 2010.

Sprinkler Project – The Sprinkler Project has been approved and involves timber harvest and associated activities on approximately 3,400 acres of National Forest lands (USDA 2007). Approximately 2,410 acres of Sprinkler Project activities fall within watersheds crossed by the ESE 6904-6905 rebuild. Activities approved in this project should be completed by the end of 2011.

Peninsula Fiber Optic Project – The Peninsula Fiber Optic Project has been approved and involves the installation of fiber optic cable along the east side of the Mackinac Trail within the road right-of-way in Mackinac and Chippewa counties, beginning in T41N R4W Section 25 continuing north and ending in T43N R3W Sec 12 (USDA 2010a). The cable was installed by directional bore and vibratory plow. The fiber optic cable will run along the opposite side of Mackinac Trail from ATC's ESE 6904-6905 rebuild within the roadside ditch. This project was completed in 2010.

Mackinac Trail Reconstruction – The Mackinac Trail Reconstruction project has been approved and involves resurfacing approximately four miles of road running from the Carp River campground just to the south of the Red Creek snowmobile trail bridge across I-75 (north of FR3113), as well as replacing the deck on the Mackinac Trail Bridge across the Carp River. This project was completed in 2010.

Shores Project – The Shores Project was proposed by the Hiawatha National Forest on October 19, 2009 and is presently undergoing NEPA review (USDA 2010b). As proposed, the project would involve approximately 1,625 acres of timber harvest and associated activities. Approximately 120 acres of proposed Shores Project activities fall within watersheds crossed by the ESE 6904-6905 rebuild. If approved, it is expected that implementation of project activities would commence no earlier than the summer of 2011.

ATC Line/ROW Maintenance – Operation of electrical transmission lines invariably requires maintenance of the ROW as well as the poles, lines, and equipment. Thus, routine maintenance would occur along the transmission corridor as long as it is in service – either in its existing configuration or upgraded condition.

Because the existing lines and associated infrastructure are quite old, substantial maintenance would be required over the next decade should they remain. Based on recent aerial and ground patrols, ATC projects around 2% of the poles would need to be replaced along with cross-arm, insulator, and associated hardware replacement on many of the other poles. Where the required work involved dead end structures, the line would need to be de-energized and taken out of service in order to complete the work.

ATC does not expect the rebuilt line would require maintenance over the next ten years, although the ROW would need some brushing in approximately 2 years and then on a five year cycle in order to control woody vegetation below the lines.

In either case, it has been ATC's practice and expectation that, absent emergency conditions, the company will notify the HNF at least five days before commencing work and the Forest Service will review in advance all plans for ROW maintenance and approve available access routes.

EUP Collaborative Additional Projects –ATC's EUP Collaborative (ATC 2009a) identified several projects in addition to the ESE 6904-6904 upgrade that may be necessary to meet future needs in the EUP. The core projects that ATC identified and are reviewing with stakeholders for input include:

- Uprate both Straits-McGulpin 138-kV overhead lines (E2)

- Uprate Pine River-9 Mile 69-kV line 6923 to 167 deg F and minimum asset renewal projects (E6, E-AR2)
- 9 Mile-ESE Hydro Minimum Asset Renewal Projects (E-AR4)
- Power Flow control on the Straits-McGulpin 138-kV Lines (E3 or E31)
- Energize the 2nd Indian Lake-Hiawatha line at 138 kV (E8).

The various projects under consideration exhibit varying degrees of performance benefit under different future demand scenarios. Therefore, they are not proposed projects at this time but rather, identified solutions that could be implemented if future conditions warrant. As a result, while not unknown or speculative, whether and when they may be carried out are both uncertain.

Frontier Renewable Resources Ethanol Plant – This project would be located on approximately 355 acres of land with 50-acres of plant area adjacent to Kinross Air Force Base in Kinross Charter Township, Chippewa County, Michigan. The plant would initially produce up to 40 million gallons per year of denatured ethanol from approximately 1,300 dry metric tons per day of cellulosic materials consisting primarily of wood wastes (DOE 2008). The possibility of cumulative effects from the Frontier plant was raised during scoping.

Although the project has been proposed, the target plant location is outside the ESE 6904-6905 project area, the Department of Energy has not yet completed its NEPA analysis, and the project proponent is still looking for funding. Furthermore, while the proposed ESE 6904-6905 rebuild is designed to support anticipated economic growth in the Eastern UP, it is not designed to support any particular development or set of developments. Therefore, the Frontier project was not analyzed in detail with respect to cumulative effects.

Road Maintenance and/or Improvements – In the future, it is likely the Forest Service, county, state and/or federal highway department will carry out road maintenance in and around the project area. Given the presence of I-75 as a primary corridor and the stable amount of local traffic (based on driving-age population figures), it is unlikely any of the roads will be expanded. Rather, grading, resurfacing, and replacement of culverts and other infrastructure are likely. At this time, however, none of the responsible agencies have any specific projects identified in the vicinity of the rebuild project. Therefore, these sorts of projects were not considered in detail from a cumulative standpoint due to their unknown and speculative nature.

Private Land Use and Development – Very little of the in-holding land along the project corridor within the National Forest is suitable for commercial development. However, in the future, it is possible that some parcels may be managed for timber or have recreation or residential structures placed on them. Given the slow growth of housing unit development in Mackinac County reported by the Census Bureau, it is likely that future building projects would be few in number and relatively small-scale.¹ Therefore, these sorts of projects were not considered in detail from a cumulative standpoint due to their unknown and speculative nature.

¹ (<http://quickfacts.census.gov/qfd/states/26/260971k.html>).

Table 3.2-1. Summary of Past, Present, and Reasonably Foreseeable Actions within the Project Area Potentially Contributing to Cumulative Effects by Resource Area.

Resources Project Name	Soils	Hydrology / Watershed / Water Quality	Wetlands	Vegetation	Non-Native Invasive Plants.	Threatened, Endangered, and Sensitive Species	Terrestrial Management Indicator Species	Fisheries, Aquatic Habitat, and Aquatic MIS	Recreation	Heritage Resources	Transportation	Visual Quality	Socio-Economic and Environmental Justice	Wild and Scenic Rivers
Red Creek Project	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Rudyard Project	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y		Y	
Niagara Project		Y	Y		Y			Y					Y	
Sprinkler Project	Y	Y	Y	Y	Y	Y	Y	Y		Y			Y	
Peninsula Fiber Optic Project		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Mackinac Trail Reconstruction		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Shores Project		Y	Y	Y	Y	Y	Y						Y	
ATC Line/ROW Maintenance	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

3.3 Soils

3.3.1 Introduction

No comments were submitted during the scoping period expressing a concern with soil resources. Therefore, this section provides a general summary of the anticipated environmental effects of the transmission line rebuild project on soil resources within the HNF in terms of Forest Service standards and management of soil resources.

Regional soil quality standards require that no more than 15 percent of the soils within the project area be detrimentally impacted by compaction, displacement, puddling/rutting, burning, erosion, loss of ground cover, or mass movement. Using these standards, at least 85 percent of the soils within the project area must remain without impact (USFS FSH 2509.18).

In 2006, additional guidelines for BMPs were added to the existing Forest Plan, which included the use of Federal Energy Regulatory Commission (FERC) BMPs and Michigan BMPs to protect the overall water quality of the watershed. The HNF FEIS outlines three concerns that can impact the overall health and productivity of the soils. First, it is important to maintain soil productivity on low productivity soils. Second, prior to and during construction and for post construction restoration, it will be necessary to understand the susceptibility of the soils to compaction, puddling, and rutting. Third, it is necessary to understand soil erosion and the processes that create and control it (USDA 2006b, 3-208 to 3-217).

3.3.2 Analysis Methods

The published Natural Resource Conservation Service (NRCS) Soil Surveys of Mackinac and Chippewa Counties in Michigan, were reviewed to determine the soil types present within the project corridor. Available information on the physical properties of the soils was analyzed during the development of the design criteria.

There were no specific field surveys conducted to verify the different types of soils identified by the NRCS within the project corridor. However, soil sampling was completed in wetlands and adjacent uplands during wetland delineation work and surface soil characteristics were observed during other resource surveys along the corridor. These data sets were used to evaluate the accuracy of soil survey digital data. The digital data was then used in a GIS model to map and identify the relationship between different proposed actions and specific soil types and to determine possible impacts.

3.3.3 Analysis Areas

The analysis area for direct, indirect and cumulative effects is the existing 100 foot wide ROW, the additional 20 foot wide new ROW, and associated access routes. Other than erosion, the potential impacts to soil quality standards are in situ. Based on the anticipated impacts and implementation of the design criteria, it is not expected that erosion would extend beyond the analysis area. The temporal boundary for direct, indirect and cumulative impacts to soils is the period of ten years. It is likely that pre-construction soil conditions would return within a decade (Pritchett and Fisher 1987).

3.3.4 Affected Environment

The affected environment includes the new and existing ROW within the HNF, as well as various routes providing access to the ROW. Twenty-two soil types intersect the existing and new ROW within the National Forest (USDA-NRCS 1992 and 1997). Twenty of those soils overlap between the two ROWs. Due to the 60-foot overlap between the two ROWs, only two soil types are not found in both ROWs. The mapped soils were characterized based on their potential construction limitations. Greater than 50% of the soils in the proposed project area are mapped as poorly drained or very poorly drained, organic soils by the NRCS (NRCS 1992 and 1997). See Tables 3.3-1 and 3.3-2.

Table 3.3-1. HNF Existing 100-foot ROW - Drainage Class		
Drainage Class	Acres	Percent
Very Poorly Drained	48.6	31.6
Poorly Drained	30.4	19.7
Very Poorly Drained to Moderately Well Drained	20.1	13.2
Very Poorly Drained to Excessively Drained	14.0	9.1
Excessively Drained	13.8	8.9
Somewhat Poorly Drained	13.3	8.6
Well Drained	10.7	6.9
NA (Gravel/Sand Pits and Water)	2.9	1.9
Very Poorly Drained to Somewhat Poorly Drained	0.2	0.1
Total	154.0	100.0

Table 3.3-2. HNF New 80-foot ROW - Drainage Class		
Drainage Class	Acres	Percent
Very Poorly Drained	42.6	33.2
Poorly Drained	26.4	20.6
Very Poorly Drained to Moderately Well Drained	14.9	11.6
Very Poorly Drained to Excessively Drained	12.0	9.4
Somewhat Poorly Drained	11.5	9.0
Excessively Drained	9.9	7.8
Well Drained	9.0	7.0
NA (Gravel/Sand Pits and Water)	1.7	1.3
Very Poorly Drained to Somewhat Poorly Drained	0.2	0.1
Total	128.2	100.0

NOTE: These acres were calculated by GIS. The actual acres may vary slightly

The drainage class of the soils range from very poorly drained to excessively drained. Very poorly drained and poorly drained soils are generally the most unstable and have the most construction limitations due generally to their high moisture and organic matter content.

Therefore, access within these soils may be limited without the use of construction mats and BMPs. Well drained and excessively drained soils are drier and usually contain less organic matter making them more stable. These soils generally have the fewest construction limitations

The slopes within the HNF vary greatly and range from level (0% slope) to very steep (>35% slope). The majority of the project area within the HNF is on level or nearly level ground (see Tables 3.3-3 and 3.3-4). Many factors influence runoff and erosion including length and degree of slope, soil texture, and vegetative cover (Brady and Weil 2002, pp. 754-762). The potential for runoff and erosion is much less in areas with level or nearly level topography. As outlined in the Forest Plan guidelines for soil management, heavy equipment should not be operated on slopes greater than 35 percent (USDA 2006a, pp. 2-15).

Table 3.3-3 HNF Existing 100-foot ROW - Slope Classes

Topography	% Slope	Acres	Percent
Level or Nearly Level	0-3	92.3	60.0
Nearly Level and Undulating	0-6	23.8	15.5
Level to Steep	0-35	14.0	9.1
Gently Rolling and Rolling	6-15	11.7	7.6
Not Rated	NA	5.9	3.8
Level to Rolling	0-15	3.4	2.2
Very Steep	35-70	2.8	1.8
Total		153.9	100.0

Table 3.3-4. New HNF 80-foot ROW - Slope Classes

Topography	% Slope	Acres	Percent
Level or Nearly Level	0-3	80.4	62.7
Nearly Level and Undulating	0-6	18.0	14.1
Level to Steep	0-35	12.0	9.4
Gently Rolling and Rolling	6-15	9.2	7.2
Not Rated	NA	4.2	3.3
Level to Rolling	0-15	2.2	1.7
Very Steep	35-70	2.1	1.6
Total		128.1	100.0

NOTE: These acres were calculated by GIS. The actual acres may vary slightly

3.3.5 Proposed Action

3.3.5.1 Direct and Indirect Effects

Application of the Design Criteria and BMPs would avoid and minimize direct and indirect effects to soil resources. However, some impacts are unavoidable.

Direct impacts would occur where excavations are made for installation of the new poles, where the old poles are removed, and where heavy equipment is used during construction.

Excavations would result in permanent soil loss, as it would be replaced with concrete and steel. Holes where poles are removed would be filled with soil, allowing those areas to slowly develop natural soil profile characteristics.

Areas where heavy equipment is used would experience differing degrees of compaction depending upon the type of equipment used, field conditions during construction, use of mats, and the underlying soil type. The general effects of traffic on the soil are increased bulk density, increased shear strength, reduced porosity, and reduced air and water permeability (Raper and Kirby 2006, p. 10). Based on the access shown on the Proposed Action maps in Appendix A within the HNF and assuming a 10-foot wide access path, approximately 19.6 acres within the HNF would be affected by access.

Compacted upland mineral soil areas are likely to exhibit the effects of vehicle traffic for several years until freeze-thaw cycles and vegetative growth return the soil to its pre-construction structure. Deep compaction to organic and wet mineral soils would be guarded against through matting and other protections, but some surface compaction may still occur. In these areas, the return of pre-project soil structure would also take several years of freezing, water flow, and plant growth. As in compacted upland mineral soils, until soil structure is restored, there may be slower water movement, increased ponding, and reduced plant growth. In both cases, it is likely that pre-construction soil conditions would return within a decade (Pritchett and Fisher 1987).

Grading may be required within some areas of the ROW in order to provide safe construction access. Based on the topography of the project (Tables 3.3-3 and 3.3-4) it is estimated that less than 10% (less than 2 acres) of the proposed access would require grading. Clearing would also be required in some areas. Although stumps would not be removed, grading and clearing practices would result in temporary exposure of soil and loss of vegetative cover in some locations. There would be an associated increased risk of erosion in such areas that would be addressed with silt fencing and other BMPs. In addition to silt fencing and other BMPs, areas of exposed soil would be seeded with appropriate cover crops and/or native vegetation to promote site revegetation and stabilized soil conditions. It is expected that soil losses would be minimal as a result.

3.3.5.2 Cumulative Effects

The only activities associated with projects listed in Section 3.2 that would involve traffic across or along the ATC ROW are several stands approved for harvest in the Rudyard Project and routine maintenance. The area of overlap of the Proposed Action and the Rudyard Project is approximately 3.0 acres. These stands have already been cut and would have resulted in direct and indirect effects to soils similar to those described above for the line rebuild in areas where equipment traveled in the transmission corridor. The effects of line reconstruction may result in a somewhat longer period of recovery for soils along the edge of these stands following construction due to the compounding effect of vehicle traffic. However, subsequent maintenance activities would be less intensive than necessary for the existing line.

Because there are no other non-maintenance activities proposed that would occur within or immediately adjacent to the ROW and affect soil resources, no other cumulative effects are likely from the rebuild as proposed.

3.3.6 Alternative 1 – No Action

3.3.6.1 Direct and Indirect Effects

Under this alternative, new poles, cross members, and associated equipment would be installed on an as-needed basis using existing maintenance procedures. Over the remainder of the existing special use permit, ATC anticipates these maintenance activities would affect $\frac{1}{3}$ to $\frac{1}{2}$ of the corridor on the HNF. Depending on the maintenance and equipment required, the type of effects to soils from equipment use during maintenance would be similar in type to those described above for the Proposed Action, but restricted to the much more limited areas of the actual maintenance work. If immediate emergency measures were required, it is possible that the effects to soils could be more severe in very localized areas than described in the proposed action depending on equipment and construction mat availability and if BMPs similar to the design criteria cannot be fully implemented due to the time-sensitive nature of the repairs. If this were to occur, the extent of these impacts would be limited to the area of the emergency response.

3.3.6.2 Cumulative Effects

The only activities associated with projects listed in Section 3.2 that would involve traffic across or along the ATC ROW are several stands approved for harvest in the Rudyard Project and routine maintenance. These stands have already been cut and would have resulted in direct and indirect effects to soils similar to those described above for the line rebuild. The effects of maintenance work in these areas may result in a somewhat longer period of recovery for soils along the edge of these stands due to the compounding effect of vehicle traffic. The cumulative effects would be generally the same as those resulting from the Proposed Action in areas where pole replacement was required due to the use of similar equipment.

Because there are no other activities proposed that would occur within or immediately adjacent to the ROW and affect soil resources, no other cumulative effects are likely from selecting the no action alternative.

3.4 Hydrology/Watershed/Water Quality

3.4.1 Introduction

No comments were submitted during the scoping period expressing a concern with water resources. Therefore, this section provides a general summary of the anticipated environmental effects of the transmission line rebuild project on water resources within the HNF in terms of Forest Service standards and management of water resources as described in the Forest Plan.

3.4.2 Analysis Methods

Several methods of analysis were used to evaluate hydrologic resources associated with the project and to assess potential affects to those resources from proposed project activities.

Prior to collecting field data, available GIS data were reviewed, and any preexisting hydrologic data included in the project's overall hydrologic analysis. The USGS National Hydrography Dataset (NHD) was used to identify hydrologic features on a landscape scale.

Field studies were conducted in the summer of 2009 by Stantec (formerly Natural Resources Consulting, Inc. [NRC]), during which previously identified surface water features were field verified and any new features documented. Waterways having a defined bed and bank within the ROW were located with a GPS unit. Waterways approximately 10 feet wide or narrower were identified with a single line (centerline of waterway), while each bank of waterways wider than 10 feet were located with a GPS unit. Detailed information collected at each stream/water feature included water depth and wetted width, bank height and width, degree of turbidity, estimated stream velocity, substrate composition, approach slope, and dominant riparian vegetation. Photographs were taken of each waterway within the project corridor (NRC 2009).

The Forest-Wide Watershed Management direction in the Forest Plan was used as a framework for evaluating the hydrologic resources within the project and surrounding watersheds and any potential impacts from proposed activities.

3.4.3 Analysis Areas

The analysis area for direct and indirect effects to watershed hydrology and water quality are the 100-foot riparian buffer areas within the project corridor that under the proposed action would have a new pole installed or a temporary clear span bridge (TCSB) crossing. The temporal period for the direct effect analysis is one growing season beyond construction to allow for the impacted areas to revegetate.

The spatial analysis area for cumulative effects to watershed hydrology and water quality is the Carp-Pine watershed since activities anywhere in the watershed could result in cumulative changes to watershed characteristics at locations downstream when combined with other activities. The temporal period for the cumulative effects analysis is ten years the approximate period it will take for soil conditions to become restored from compaction from heavy equipment, and harvest units identified in the projects listed Section 3.2 to regenerate into immature forest.

3.4.4 Affected Environment

All the surface water features within the project corridor are within the Carp-Pine watershed. The Carp-Pine watershed encompasses approximately 660 square miles draining into Lake Huron and is divided into 36 subsections based on surface water features. The Project Corridor covers about 192 acres within the watershed on the HNF, or about 0.05 percent of its total area, and crosses ten of the watershed's subsections.

There are 21 surface water features identified by either the NHD or during the field surveys on the HNF within the project corridor. Table 3.4-1 list waterway features and any project related work or potential impacts within each of the waterway's 100 foot riparian buffer areas.

Table 3.4-1. List of Surface Water Features in HNF Crossed by the ESE 6904-6905 Transmission Line Corridor.

Feature ID	Feature Type	Resource Name (if applicable)	PLSS Location	Project Impacts Within 100' Riparian Buffer
495-S1	waterway	UNT	43N03W12	TCSB
497-S1	waterway	UNT	43N03W12	TCSB, 1 new pole, remove 1 pole
499-S1	waterway	UNT	43N03W12	2 TCSB, 1 new pole, remove 1 pole
587-S1	waterway	McCloud Creek	42N03W04	TCSB, 1 new pole
602-S1	waterway	UNT to Platz Lake	40N30W27	Remove 2 poles (1 in HNF)
603-S1	Sensitive species streamlet	UNT to Platz Lake	40N30W27	Remove 1 pole (same as 602-S1)
604-S1	Sensitive species streamlet	UNT to Platz Lake	40N30W27	none
608-S1	waterway	UNT to Platz Lake	40N30W27	TCSB, remove 1 pole, 1 new pole
657-S1	waterway	UNT	42N03W30	TCSB, 1 new pole
684-S1	waterway	Martineau Creek	42N03W31 / 42N04W36	Remove 1 pole, 1 new pole
699-S1	waterway	UNT	41N04W01	Remove 1 pole
724-S1	waterway	UNT	41N04W13	Remove 2 poles, 1 new pole
728-S1	ditch	roadside ditch	41N04W13	None
728.5-S1	waterway	UNT	41N04W13	2 TCSB
S-734	Sensitive species streamlet	UNT	41N04W13	Remove 1 pole
S-734.5	Sensitive species streamlet	UNT	41N04W13	TCSB (adjacent wet area), remove 1 pole, 1 new pole
S-735	Sensitive species streamlet	UNT	41N04W13	TCSB (adjacent wet area), remove 1 pole, 1 new pole (same as 734.5)
S-736	waterway	UNT	41N04W13	Remove 1 pole
745-S1	waterway	Foley Creek	41N04W24	TCSB , remove 1 pole
752-S1	waterway	Rabbit Back Creek	41N04W24 / 41N04W25	Remove 1 pole
S-789	Sensitive species streamlet	UNT Hoban Creek	40N04W01	Remove 2 poles, 2 new poles

UNT = Unnamed tributary

None of the water features within the project area are identified as “impaired” by the United States Environmental Protection Agency (EPA). The Carp River is on the National Park Service list of Wild and Scenic Rivers. Although the Carp River does not directly intersect the proposed project ROW within the National Forest, it does cross the ROW on private land (see Section 3.16).

3.4.5 Proposed Action

3.4.5.1 Direct and Indirect Effects

The Proposed Action would not involve in-stream structures or in-stream work, would not affect stream water sources, would not alter floodplain characteristics, and would not affect in-stream processes. In wetlands, the amount and type of fill required to install the new structures is insufficient to modify the internal hydrology of the affected wetlands or their recharge/discharge characteristics. Therefore, implementing the project as proposed would not have any direct effects on water resources.

Application of the Design Criteria and BMPs would avoid and minimize direct and indirect effects to water resources. However, some impacts are not completely avoidable and may result in small scale, local alterations of flows and water quality. Implementation of the proposed action requires the following work within the 100-foot riparian buffers in the HNF: installation TCSBs over 10 waterways for access to the project corridor, removal of 15 existing wood poles, and the installation of 10 new steel poles. The proposed action maps in Appendix A show the existing and proposed pole locations and the anticipated locations of access routes and TCSBs. The actual locations of access routes and TCSBs may be shifted within the ROW at the time of construction to further avoid or minimize impacts. Indirect effects to watershed hydrology and water quality from these activities could include slightly increased localized runoff and small losses of soil from compacted areas and areas exposed by equipment travel, excavation, pole removal, and grading.

Studies of timber harvest effects to watersheds in Wyoming, New Hampshire, and around the Lakes States suggest that a common result of forest cover reduction is a small increase in peak flows and an increase in the frequency and duration of high, near bank full discharges (Troendle et al. 1998, Hornbeck et al 1997, Verry 1986). The proposed action would result in clearing an additional 20 feet in various areas along the edge of the existing ROW in order to install the new poles and lines. The total area that would need to be converted to new ROW (cleared and maintained in herbaceous cover free of tall growing species) is approximately 32.5 acres. Given the small scale of the change in vegetative cover in comparison to the watersheds, there may be some very small, short-term, local increases in runoff from the ROW during construction, but no measurable changes in stream flow are likely. In addition, a majority of the 40 feet of transmission line ROW that would be abandoned by ATC would be allowed to naturally revegetate to forest and shrub communities, and would likely lead to reductions in runoff compared to current conditions.

Soils exposed by equipment use and grading may result in minor local movement of eroded material. Application of Design Criteria and BMPs make it unlikely that these losses would enter waterbodies. In addition to the use of BMPs, areas of exposed soil would be seeded with

appropriate cover crops and/or native vegetation to promote site revegetation and stabilized soil conditions.

3.4.5.2 Cumulative Effects

The total area included in the Proposed Action is about 0.05 percent of the Carp-Pine River Watershed and its associated watershed subdivisions, and the total area within the project corridor that would have vegetative cover changes would be substantially less than this. Therefore, implementing the Proposed Action would contribute almost no incremental increases in runoff, water yield, or soil loss when combined with the nearly 8,500 acres of vegetation management (about 2 percent of the watershed) approved within the Carp-Pine watershed in the projects listed in Section 3.2. Therefore, the Proposed Action should not contribute to cumulative effects within the watersheds the corridor crosses.

3.4.6 Alternative 1 – No Build

3.4.6.1 Direct, Indirect, and Cumulative Effects

Under this alternative, new poles, cross members, and associated equipment would be installed on an as-needed basis using existing maintenance procedures. Over the remainder of the existing special use permit, ATC anticipates these maintenance activities would affect $\frac{1}{3}$ to $\frac{1}{2}$ of the corridor on the HNF. The type of effects to water resources from equipment use during maintenance would be similar to those described above for the Proposed Action, but restricted to the actual areas of maintenance work. Vegetative changes would be generally avoided. Therefore, maintaining the existing line should not contribute to cumulative effects when combined with other vegetation management activities.

3.5 Wetlands

3.5.1 Introduction

No comments were submitted during the scoping period expressing a concern with wetland resources. Therefore, this section provides a general summary of the anticipated environmental effects of the transmission line rebuild project on wetland resources within the HNF in terms of composition, structure and function and management of wetland resource values as described in the Forest Plan.

3.5.2 Analysis Methods

Wetland extent and condition were assessed in the field during the summer of 2009. Field assessments included the completion of a wetland delineation, plant surveys, and community mapping. The wetland delineation followed guidelines established in Michigan Department of Environmental Quality's (MDEQ) Wetland Identification Manual (MDEQ 2001). Plant survey and vegetation mapping methods are described in Section 3.6. Acreage calculations were made using of ArcView GIS.

Evaluation of potential wetland impacts and consistency with Forest Plan guidelines was carried out by considering how proposed activities may affect the composition, structure, and function of wetland crossed by the project.

3.5.3 Analysis Areas

The spatial limit of the direct and indirect effects analysis of wetland resources is the entire project corridor and associated access routes. This area was selected as the spatial boundary because activities conducted in upland locations often affect down slope wetlands. The temporal period of the direct and indirect effects analysis is the anticipated to be the 12 - 15 months during which construction activities would take place plus an additional growing season to allow the reestablishment of vegetation.

The spatial limit of the analysis of cumulative effects to wetland resources is the subwatersheds crossed by the project. This area was selected since activities anywhere in the contributing watersheds could result in cumulative changes to wetland characteristics at locations downstream when combined with other activities. The temporal period for the cumulative effects analysis is 5 years, which is the time for shrubby vegetation to become reestablished in the project corridor.

3.5.4 Affected Environment

Approximately 31 wetlands were identified the project corridor within the HNF. These wetlands cover approximately 130.5 acres of the project corridor and include five distinct community types: wet meadow, emergent marsh, shrub swamp, bog, and mixed coniferous swamp (Table 3.5-1). Wet meadow is the most common wetland type within the existing transmission line ROW, while the mixed coniferous swamp is the prevalent wetland community located outside of the ROW. For a complete description of the project corridor's wetland plant communities, see Section 3.6.

The majority of the wetlands are located on organic soils underlain by sandy subsoil. Most wetlands in the HNF portion of the project corridor receive hydrologic inputs via shallow groundwater flow-through, with negligible water amounts supplied by overland flow.

Table 3.5-1. List of Wetlands Crossed by the ESE 6904-6904 Survey Area (Existing and Proposed ROW) within the HNF

ID	Type ¹	Acres in ROW
508-W1	wet meadow	13.8
516-W1	wet meadow	4.1
519-W1	wet meadow	3.6
526-W1	wet meadow	0.6
532-W1	wet meadow	3.4
541-W1	wet meadow	2.7
546-W1	wet meadow	1.0
583-W1	wet meadow	19.3
584-W1	wet meadow	1.8
586-W1	wet meadow	5.4
598-W1	open water / wet meadow	8.2
625-W1	cedar swamp edge of ROW	<0.1
638-W1	bog / muskeg	0.5
639-W1	wet meadow	0.1
652-W1	wet meadow	1.4
654-W1	wet meadow	0.1
658-W1	emergent marsh / wet meadow	1.5
693-W1	wet meadow	29.5
717-W1	emergent marsh	6.0
730-W1	shrub swamp / wet meadow	1.3
735-W1	shrub swamp / wet meadow	3.5
741-W1	wet meadow / bog	4.5
745-W1	shrub swamp	0.3
747-W1	wet meadow	1.1
749-W1	wet meadow	0.1
749-W2	wet meadow	<0.1
749-W3	wet meadow	<0.1
750-W1	wet meadow	0.1
750-W2	wet meadow	0.1
751-W1	wet meadow	1.9
757-W1	wet meadow	9.6
792-W1	wet meadow / emergent marsh	4.7
813-W2	shrub swamp	0.2
	Total	130.5

¹Wetland type within existing ROW. Most new ROW is forested.

NOTE: These acres were calculated by GIS. The actual acres may vary slightly

3.5.5 Proposed Action

3.5.5.1 Direct and Indirect Effects

Direct effects to wetland resources would occur from excavating for the new poles, clearing for the ROW offset, moving equipment, removing the existing poles, and abandoning portions of the ROW presently being managed. These effects would be minimized by applying Design Criteria and BMPs, but are not fully avoidable.

Excavation and clearing to install the new poles would result in a small loss of wetland acreage and the conversion of 24.6 acres of forested or shrub wetland to herbaceous cover within the HNF (Table 3.5-2). However, the areas lost and converted would eventually be compensated for by redevelopment of forested or shrubby wetland communities within the abandoned areas of the ROW that are taken out of maintenance activities and allowed to regenerate. These areas of regeneration total approximately 39.1 acres (Table 3.5-3). In addition, the affected areas are small relative to the project corridor's total wetland area, thus the wetland losses and conversion would not alter the basic physical parameters of the landscape (soil, topography, and hydrology) that determine the overall composition, structure, and distribution of plants in the wetland and their use by wildlife.

Table 3.5-2. List of Forested and Shrub-Dominated Wetland Areas That Would Be Converted To Herbaceous Cover on HNF

ID	Acres of Forested/Shrub Wetlands to be Cleared	ID	Acres of Forested/Shrub Wetlands to be Cleared
508-W1	2.6	658-W1	0.3
516-W1	0.7	693-W1	6.4
519-W1	0.6	717-W1	0.7
526-W1	0.1	730-W1	0.6
532-W1	0.5	735-W1	0.6
541-W1	0.4	741-W1	0.8
546-W1	0.1	745-W1	0.2
546-W1	0.1	747-W1	0.2
583-W1	2.8	749-W1	<0.1
584-W1	0.2	749-W2	<0.1
586-W1	0.8	750-W1	<0.1
598-W1	1.0	750-W2	<0.1
625-W1	<0.1	751-W1	0.3
638-W1	0.4	757-W1	1.5
652-W1	<0.1	792-W1	1.8
654-W1	<0.1	813-W2	0.2
		Total	24.6

NOTE: These acres were calculated by GIS. The actual acres may vary slightly

Table 3.5-3. List of Wetland Areas Within the Existing ROW, Adjacent to Forested or Shrub Wetlands That Would Be Abandoned and Allowed to Regenerate to Natural Vegetative Communities on HNF

ID	Existing ROW Wetland Type	Re-Vegetation Type	Wetland acres in Abandoned ROW
508-W1	wet meadow	forested wetland	4.2
516-W1	wet meadow	forested wetland	1.2
519-W1	wet meadow	forested wetland	1.1
526-W1	wet meadow	forested wetland	0.2
532-W1	wet meadow	forested wetland	0.2
541-W1	wet meadow	forested wetland	1.0
546-W1	wet meadow	forested wetland	0.3
583-W1	wet meadow	forested wetland	6.5
584-W1	wet meadow	forested wetland	0.7
586-W1	wet meadow	forested wetland	1.9
598-W1	open water /wet meadow	shrub wetland	2.0
652-W1	wet meadow	forested wetland	0.1
652-W1	wet meadow	forested wetland	0.3
693-W1	wet meadow	forested wetland	8.9
717-W1	emergent marsh	forested wetland	1.9
730-W1	shrub swamp / wet meadow	forested wetland	0.4
735-W1	shrub swamp / wet meadow	forested wetland	0.9
741-W1	wet meadow / bog	forested wetland	1.3
745-W1	shrub swamp	shrub swamp	0.2
747-W1	wet meadow	shrub swamp	0.4
749-W1	wet meadow	forested wetland	<0.1
749-W3	wet meadow	forested wetland	<0.1
750-W1	wet meadow	forested wetland	<0.1
750-W2	wet meadow	forested wetland	<0.1
751-W1	wet meadow	forested wetland	0.6
757-W1	wet meadow	forested wetland	3.3
792-W1	wet meadow / emergent marsh	forested wetland	1.1
Total			39.1

NOTE: These acres were calculated by GIS. The actual acres may vary slightly

Other effects from soil compaction, migration, and suspension, and vegetative damage are summarized in the soils and vegetation sections. In general, the effects described would be insignificant, localized, and of relatively short duration (Reed 1996). Therefore, the existing composition, structure, and function of the affected wetlands should not be altered from construction of the rebuild.

3.5.5.2 Cumulative Effects

The Proposed Action would not result in cumulative impacts to the project corridor's wetland resources since:

- No other projects have been carried out or are expected to take place within the affected wetlands, and
- The transmission line upgrade would not have direct, indirect, or cumulative effects to hydrology determining wetland composition, structure, and function (Section 3.4).
- Scheduled maintenance activities (vegetation management) would be of low intensity.

3.5.6 No Action Alternative

3.5.6.1 Direct and Indirect Effects

If upgrades to the existing transmission line do not occur across the HNF, no resource effects from construction would take place. However, ATC would continue to manage the existing project corridor under their existing special use permit; new poles, cross members, and associated equipment would be installed on an as-needed basis. Over the remainder of the existing special use permit, ATC expects such maintenance activities would affect from a third to a half of the corridor in the HNF. Effects to wetland resources from maintenance would be similar in nature to those described above for the Proposed Action, but restricted to the specific locations of the maintenance work.

In addition, ATC would continue to maintain the corridor in herbaceous cover. Because this activity is carried out using small equipment with relatively low ground pressure and is more frequently needed in uplands, no effects to wetlands from ROW vegetation management are expected.

3.5.6.2 Cumulative Effects

As with the Proposed Action, implementation of the No Action Alternative would not result in cumulative impacts to the project corridor's wetland resources since no other projects have been carried out or are expected to take place within the affected wetlands. In addition, scheduled maintenance activities (vegetation management) would be of low intensity.

3.6 Vegetation

3.6.1 Introduction

This section provides a general overview of the vegetation communities along the ATC ESE 6904-6905 transmission corridor. No comments were submitted concerning vegetation during the project scoping period. Therefore, the analysis presented considers how possible activities could affect the forest health and diversity along the corridor, and how the corridor expansion may affect vegetation composition related to the desired conditions described in the Forest Plan.

3.6.2 Analysis Methods

Data on the vegetation communities present along the project corridor were obtained from the Forest Plan and from field inventories completed by qualified field biologists. Forest stands classify vegetation according to seral stage (vegetation composition), size class and stocking level. Stand level data was used to identify general forest characteristic, such as dominant tree species, in localized areas along the project corridor. Acreage of impacts associated with the different community types present along the project corridor were based on stand acreages maintained by the HNF.

Field surveys were conducted within the existing transmission line corridor, 100 feet outside of the existing corridor, and additional areas included in the rebuild offset in 2009 and 2010. Data collected from the field surveys were used to verify the stand data maintained by the HNF and to identify any unique or sensitive community types along the project corridor. The purpose of the field surveys was to locate and document any plants listed as rare in the state of Michigan, locate any populations of non-native invasive plants, and to map community types along the project corridor. All surveys utilized an intuitive control methodology.

3.6.3 Analysis Areas

The spatial boundary for the direct and indirect effects is the area within the existing corridor, as well as an additional 20 feet on the side of the new line offset because this is the area where vegetation would be cut. The temporal period of the direct and indirect effects analysis is 5 years after the completion of construction, which is the time anticipated for the regeneration of shrub and tree species.

The spatial boundary for cumulative effects is the boundaries of the Management Areas (MA) that overlap with the project area. Management Areas consist of a specific geographic location on the forest where specific management directions is applied (USDA 2006a). The temporal period for the cumulative effects analysis is ten years, which is the approximate time it will take for forest vegetation to become reestablished in the abandoned ROW.

3.6.4 Affected Environment

Based on survey reports and field observations, the following Michigan Natural Features Inventory plant communities are known to occur within and adjacent to the project corridor: Boreal Forest, Dry-Mesic Northern Forest, Rich Conifer Swamp, Poor Conifer Swamp, Mesic

Northern Forest, Dune/ Swale Complex, Emergent Marsh, Muskeg, Northern Fen, Northern Shrub Thicket, and Northern Wet Meadow (MNFI 2007).

Approximately 53% of the proposed corridor is located within the HNF. The Project Corridor crosses four MA units, identified as 1.2, 4.5, 6.4 and 8.4.2. The percentage of land cover within each MA is identified in Table 3.6-1 below.

Table 3.6-1. Management Areas (MAs) crossed by the ESE 6904-6905 Project Corridor within the HNF

Management Area	Length Crossed (mi)	Acres	Percentage of Forest-Wide MA area
1.2	1.9	22.8	0.05
4.5	3.2	39.0	0.03
6.4	6.0	72.2	0.16
8.4.2	1.1	12.9	0.22
Total	12.2	146.9	--

NOTE: These acres were calculated by GIS. The actual acres may vary slightly

The transmission line corridor passes along nine stands classified as old growth (Table 3.6-2).

Table 3.6-2. Old Growth Stands associated with the ATC ESE 6904-6905 Corridor and their approximate border length along the ROW

Stand	Forest Type	Size/Density	Length of Border (ft)
120-11	Red Pine	Poletimber / Medium	220
120-13	Red Pine	Sawtimber/ Medium	4,600
156-21	Cedar	Sawtimber/High	1,300
156-23	Cedar	Sawtimber/High	50
158-20	Cedar	Sawtimber/High	6,400
182-22	Red Pine	Poletimber / Medium	1,000
182-27	Red Pine	Poletimber / Medium	1,100
193-09	Cedar	Poletimber / Medium	790
193-45	Cedar	Poletimber / Medium	720
Total			16,180

NOTE: These acres were calculated by GIS. The actual acres may vary slightly

At a national level, the Forest Service defines old growth as forest ecosystems distinguished by old trees and related structural attributes. Old growth encompasses the later stages of stand development that typically differ from earlier stages in a variety of characteristics, which may include tree size; accumulations of large, dead, woody material; a number of canopy layers; species composition; and ecosystem function. Under this definition, some maturing second growth forests could be included, if allowed to approach old growth conditions through appropriate management direction (USDA 2006b, p. 3-33). On the HNF, old growth forests are ecosystems where natural biological processes predominate. They can be described as blocks of land characterized by older larger trees, native species and low road and trail densities. The structural diversity contained within an old-growth forest can include multi-layered canopies, canopy gaps, tip-up mounds and an accumulation of dead woody material including standing snags and large logs on the forest floor. Very little true old growth remains on the HNF or in the Upper Peninsula. It is estimated that there are only about 500 acres of remnant old growth on the HNF. Many stands classified as old growth do not currently meet the Forest Service's definition of old growth, but will develop old growth characteristics as the stands mature (USDA 2006b, p. 3-33, 3-34). The Forest Plan old growth objective is to maintain 52,000 acres in the old growth system (USDA 2006a, p. 2-11).

3.6.5 Proposed Action

3.6.5.1 Direct and Indirect Effects

General Vegetative Effects

ATC is required to operate its transmission lines in compliance with regulations issued by the U.S. Federal Energy Regulatory Commission ("FERC"). In addition, FERC has identified the Wire Zone-Border Zone Right of Way management process as the ideal model for ROW management (FERC 2004, p. 10). In this model, all trees and woody vegetation are removed from the transmission line wire zone. Low growing plant species may be allowed in the border zone so long as they are not so dense as to restrict access to the transmission facilities, and tall growing species are not permitted where they could grow or fall into the lines. The O&M Plan for the Proposed Action is in Appendix B.

The proposed action requires approximately 20 feet of new ROW on the side of the offset. Forested areas within the 20 feet of new ROW would be cleared and maintained in low growing vegetation. This clearing would be an irretrievable commitment of resources. Table 3.6-2 lists the compartments, stands and forest types that would be cleared for the 20 feet of new ROW. Approximately 40 feet of ROW on the opposite side from the offset would be abandoned and allowed to regenerate. Following construction, the 80 foot wide ROW (20 feet of new ROW + 60 feet of existing ROW) would be maintained in herbaceous cover while the lines are in operation as described in the O&M Plan in Appendix B.

In addition to the tree clearing activities for the new ROW, impacts to vegetation would occur from mowing and removal of woody vegetation from the existing ROW, access for construction equipment, and pole installation and removal. Prior to construction activities and in conjunction with the new ROW clearing described above, tall growing woody species would be cut and the

existing ROW may be mowed as part of the ongoing ROW vegetation maintenance cycle and to facilitate construction access. This cutting and/or mowing would be similar to the past ROW maintenance and would be in accordance with the O&M Plan.

Some crushing of vegetation would occur in areas where equipment travels and in areas where mats are placed to facilitate access. Implementation of design criteria and BMPs in sensitive areas would minimize damage, but some damage is still probable within the travelway. Based on the access shown on the Proposed Action maps in Appendix A within the HNF and assuming a 10-foot wide access path, approximately 19.6 acres of vegetation within the HNF would be affected by access. These effects would include removal or crushing by equipment travel or mat placement. For direct embed pole structures, vegetation within a 3 to 5 feet diameter would be permanently removed for the installation of the structure. In locations where poles require a new foundation, vegetation within a 6 to 12 feet diameter area would be permanently removed for the installation of the concrete foundation.

Table 3.6-3 summarizes the amount of forest clearing required for the new ROW associated with the Proposed Action. Damage to vegetation that is not a type conversion should recover within the next growing season.

Table 3.6-3. List of compartments, stands, and acres that would be incorporated into the new ESE 6904-6905 corridor to allow for a rebuild to 138 kilovolts. Forested areas would be cleared for construction.

MA	Comp.	Stand	Forest Type	Size / Density	Acres
1.2	28	8	White Cedar	Poletimber / Medium	0.9
1.2	32	11	White Cedar - Aspen - Paper Birch	Poletimber / Medium	0.3
1.2	28	10	White Cedar - Aspen - Paper Birch	Sawtimber / Medium	0.4
1.2	28	12	Quaking Aspen	Seedling-Sapling / High	0.4
1.2	32	9	Quaking Aspen	Seedling-Sapling / High	0.8
1.2	28	15	Quaking Aspen	Poletimber / Medium	0.7
1.2	28	13	Non-Forested	Non-Stocked	<0.1
1.2	32	10	Non-Forested	Non-Stocked	<0.1
1.2	32	20	Non-Forested	Non-Stocked	0.7
1.2	56	18	Non-Forested	Non-Stocked	0.9
4.5	63	7	White Cedar	Poletimber / High	0.6
4.5	90	24	White Cedar	Poletimber / High	0.9
4.5	122	2	White Cedar	Poletimber / High	<0.1
4.5	159	2	Swamp Conifer	Seedling-Sapling / High	0
4.5	63	20	White Cedar - Aspen - Paper Birch	Sawtimber / High	0.6
4.5	90	15	White Cedar - Aspen - Paper Birch	Sawtimber / High	1.2
4.5	90	12	White Cedar - Aspen - Paper Birch	Sawtimber / High	0.5
4.5	101	12	White Cedar - Aspen - Paper Birch	Sawtimber / High	0.5
4.5	122	14	Quaking Aspen	Seedling-Sapling / Medium	<0.1
4.5	122	19	Quaking Aspen	Seedling-Sapling / Medium	0.1
4.5	101	11	Quaking Aspen	Seedling-Sapling / High	0.7
4.5	122	18	Quaking Aspen	Seedling-Sapling / High	<0.1
4.5	101	5	Quaking Aspen	Poletimber / High	0.4

Table 3.6-3. List of compartments, stands, and acres that would be incorporated into the new ESE 6904-6905 corridor to allow for a rebuild to 138 kilovolts. Forested areas would be cleared for construction.

MA	Comp.	Stand	Forest Type	Size / Density	Acres
4.5	63	21	Non-Forested	Non-Stocked	0.2
4.5	90	13	Non-Forested	Non-Stocked	<0.1
4.5	101	8	Non-Forested	Non-Stocked	<0.1
4.5	101	32	Non-Forested	Non-Stocked	<0.1
4.5	101	33	Non-Forested	Non-Stocked	<0.1
4.5	102	1	Non-Forested	Non-Stocked	0.4
4.5	122	9	Non-Forested	Non-Stocked	0.5
4.5	122	21	Non-Forested	Non-Stocked	0.9
4.5	122	8	Non-Forested	Non-Stocked	<0.1
4.5	159	17	Non-Forested	Non-Stocked	0.9
6.4	182	27	Red Pine	Poletimber / Medium	0.1
6.4	193	42	Red Pine	Sawtimber / High	<0.1
6.4	179	3	White Cedar	Seedling-Sapling / High	0.5
6.4	158	24	White Cedar	Poletimber / High	<0.1
6.4	158	22	White Cedar	Poletimber / High	0.1
6.4	156	21	White Cedar	Poletimber / High	0.7
6.4	181	2	White Cedar	Poletimber / High	0.2
6.4	181	18	White Cedar	Poletimber / High	0.3
6.4	193	9	White Cedar	Poletimber / High	0.4
6.4	201	18	White Cedar	Sawtimber / High	0.4
6.4	201	16	Swamp Conifer	Seedling-Sapling / High	0.2
6.4	158	25	Swamp Conifer	Seedling-Sapling / High	0.3
6.4	193	8	Swamp Conifer	Seedling-Sapling / High	1.5
6.4	193	12	Swamp Conifer	Seedling-Sapling / High	0.7
6.4	181	21	Swamp Conifer	Sawtimber / Medium	0.5
6.4	181	11	Red Maple - wet site	Poletimber / High	<0.1
6.4	201	17	Aspen - White Spruce - Balsam Fir	Poletimber / High	0.6
6.4	181	12	Lowland Shrubs	Non-Stocked	0.5
6.4	182	51	Lowland Shrubs	Non-Stocked	<0.1
6.4	193	3	Lowland Shrubs	Non-Stocked	<0.1
6.4	122	11	Non-Forested	Non-Stocked	0.5
6.4	158	27	Non-Forested	Non-Stocked	1.7
6.4	158	23	Non-Forested	Non-Stocked	0.1
6.4	179	4	Non-Forested	Non-Stocked	0.7
6.4	179	5	Non-Forested	Non-Stocked	<0.1
6.4	179	2	Non-Forested	Non-Stocked	0.5
6.4	181	1	Non-Forested	Non-Stocked	0.3
6.4	181	13	Non-Forested	Non-Stocked	1.5
6.4	181	6	Non-Forested	Non-Stocked	1.1
6.4	181	25	Non-Forested	Non-Stocked	<0.1
6.4	182	28	Non-Forested	Non-Stocked	0.6
6.4	182	30	Non-Forested	Non-Stocked	<0.1

Table 3.6-3. List of compartments, stands, and acres that would be incorporated into the new ESE 6904-6905 corridor to allow for a rebuild to 138 kilovolts. Forested areas would be cleared for construction.

MA	Comp.	Stand	Forest Type	Size / Density	Acres
6.4	193	2	Non-Forested	Non-Stocked	0.4
6.4	193	7	Non-Forested	Non-Stocked	<0.1
6.4	201	8	Non-Forested	Non-Stocked	0
8.4.2	120	11	Red Pine	Poletimber / Medium	0
8.4.2	120	19	Black Spruce	Seedling-Sapling / Medium	0.1
8.4.2	120	10	Paper Birch	Poletimber / High	0.2
8.4.2	120	15	Aspen - White Spruce - Balsam Fir	Poletimber / High	0.3
8.4.2	120	12	Non-Forested	Non-Stocked	1.5
8.4.2	156	26	Non-Forested	Non-Stocked	0.6
TOTAL					32.5

NOTE: These acres were calculated by GIS. The actual acres may vary slightly

Table 3.6-4 summarizes the amount of forest clearing required within old growth stands for the new ROW associated with the Proposed Action. The Proposed Action would clear approximately 20 feet along the edge of the ROW in three old growth stands, resulting in clearing of approximately 1.6 acres. Two of the nine old growth stands would have areas within the abandoned ROW totaling about 6.6 acres that would be allowed to re-grow, but the species type is cedar so regeneration would be slow. It may take 100 years or more for the abandoned ROW to regenerate into a mature forest approaching old growth conditions.

Table 3.6-4. Old Growth Stands along the ATC ESE 6904-6905 Corridor and effects of implementing the Proposed Action

Stand	Forest Type	Size/Density	Clearing (ac)	Potential Regrowth (ac)
120-11	Red Pine	Poletimber / Medium	0.0	0.0
120-13	Red Pine	Sawtimber/ Medium	0.0	0.0
156-21	Cedar	Sawtimber/High	0.7	0.0
156-23	Cedar	Sawtimber/High	0.0	Negligible
158-20	Cedar	Sawtimber/High	0.0	5.9
182-22	Red Pine	Poletimber / Medium	0.0	0.0
182-27	Red Pine	Poletimber / Medium	0.5	0.0
193-09	Cedar	Poletimber / Medium	0.4	0.0
193-45	Cedar	Poletimber / Medium	0.0	0.7
Total			1.6	6.6

3.6.5.2 Cumulative Effects

Projects listed in Section 3.2 that include timber management (Rudyard, Niagara, Sprinkler, Shores) only include a small number of stands along the ROW. The Niagara project is located outside of the cumulative effects analysis area. The Rudyard project included 348 acres of

clearcuts and 3,408 acres of salvage cutting and has been completed. The Sprinkler project includes approximately 1,627 acres of clearcuts and salvage clearcutting to be completed by the end of 2011. The proposed Shores project includes approximately 847 acres of clearcuts over the next 10 years. The clearcuts associated with these projects would result in temporary openings of various sizes, scattered throughout the analysis area over the past 10 years and continuing for the next ten years. These openings would regenerate over time. In addition, it is anticipated that the proposed clearing of 20 feet of new ROW along with the abandonment of 40 feet of existing ROW would eventually result in a net increase of forested land adjacent to the project corridor.

The Forest Plan requires the HNF to maintain 52,000 acres of old growth (USDA 2006a, p. 2-11). None of the timber management or other projects listed in Section 3.2 include impacts to old growth. The proposed action includes clearing of 1.6 acres within old growth stands for the new ROW adjacent to the existing ROW, along with the abandonment of 6.6 acres of existing ROW within old growth stands that would regenerate into forest.

The term old growth, as used in this document, refers to the forest service definitions in Section 3.6.4. The State of Michigan also manages old growth forests on state owned land through their Old Growth and Biodiversity Stewardship program (MDNR 2001). Private lands within the cumulative effects boundary are typically smaller tracts with variable management and use. The long term management and viability of old growth forests on private property within the cumulative effects boundary, if any, is uncertain due to the lack of federal or state protection or management requirements.

3.6.6 Alternative 1-No Action

3.6.6.1 Direct and Indirect Effects

The No Action Alternative would not expand the existing ROW and no tree clearing- including old growth- would be required. ATC would continue the current vegetation management (mowing) cycle and would install new poles, cross members, and associated equipment on an as-needed basis using existing maintenance procedures. ATC expects such maintenance activities would affect from 1/3 to 1/2 of the corridor in the HNF. The type of effects to vegetation from equipment use during maintenance would be similar to those described above for the Proposed Action, but restricted to the area of work.

3.6.6.2 Cumulative Effects

Cumulative effects only occur when a project's impacts are added to other past, present, and reasonably foreseeable future actions. The No Action Alternative represents the current base line condition including vegetation management and other maintenance activities. The continuation of these activities would maintain the existing vegetative condition and thus have no cumulative effects when added to the other reasonably foreseeable projects analyzed.

3.7 Non-Native Invasive Plants

3.7.1 Introduction

Based on comments received from the public during scoping, there is concern that the clearing and associated construction would promote the spread of non-native invasive plants (NNIP).

Since European settlement, NNIP have been introduced into the landscape. Because they lack pathogens and predators, some NNIP have become persistent, aggressive invaders of disturbed habitats and native plant communities. They may become the dominant component of vegetation, thus reducing native plant diversity and impacting ecosystem habitat (USDA 2007a, p.5). Once introduced, NNIP can spread rapidly under certain conditions, sometimes into undisturbed habitat. The effects on the native habitat may not be evident until decades after weeds are introduced. Some invasive plant control methods are available on the HNF, but prevention is the most effective.

The HNF has developed a list of 28 NNIP species of concern that lists these species according to high or medium priority for management (USDA 2007a, p. 5). In general, NNIP occur in highly disturbed areas, such as roadsides, gravel pits, wildlife openings and utility corridors. The open canopy conditions that can result from construction activities associated with corridor projects provide ideal growth conditions for many NNIP species. A few species can tolerate both the open canopy condition of the corridor in addition to the closed canopy of the adjacent forest (USDA 2007a, p. 5-6, 31).

Overall, species that are present would be prevented from spreading by implementing preventative measures such as using weed free gravel or mulch; or by minimizing the amount of ground disturbance (USDA 2007a). Winter construction would also help to minimize the potential spread of NNIP.

3.7.2 Analysis Methods

NNIP inventories were conducted for those species identified on the Hiawatha's NNIP species of concern list throughout the proposed project area via pedestrian surveys in 2009 and 2010; concurrently with the threatened, endangered, and sensitive species (TES) plant surveys and wetland delineations. Information such as species, location (mapped using Trimble GPS technology or aerial delineated on a recent photograph), abundance and distribution was recorded. The data collected is not considered complete, but provides a sufficient sample to assess the abundance and distribution of NNIP along the proposed project area. Because NNIP conditions can change based on their rate of spread and the suitability of their habitat, updated NNIP maps would be used during implementation.

3.7.3 Analysis Areas

Because NNIP can spread by various vectors within disturbed habitat such as roads and trails, which provide a conduit for NNIP, the boundary of analysis for NNIP effects includes the entire proposed project area (existing corridor and all proposed access routes) plus 100 feet around the project area. The additional 100 feet around the project area includes the area of potential micro-climate (temperature and humidity) change due to adjacent tree removal.

The temporal period of the direct and indirect effects analysis is 5 years after construction, which corresponds to the expected time for permanent vegetation communities to become reestablished. This is when all project-related activities are expected to occur and cease and the impacts of this project would no longer be evident.

The spatial boundary for cumulative effects for NNIP is eastern Mackinac and the southern portion of Chippewa counties. This area encompasses the past, present, and reasonably foreseeable future projects listed in Section 3.2 that could contribute to NNIP establishment or spread in the proposed project area because of proximity and transportation patterns. Activities on state and private lands outside of the HNF boundary within this area also have the potential to contribute to cumulative effects. The temporal period of the cumulative effects analysis is 5 years after construction, which corresponds to the expected time for permanent vegetation communities to become reestablished.

3.7.4 Affected Environment

NNIP were found in scattered locations throughout the project area; however, they were most abundant in areas that were dissected by public road ROWs, adjacent to private landholdings, and gravel pits. Relatively few NNIP occur in undisturbed native plant communities, such as open wet meadows or fen communities where soil disturbances were not prevalent. Species known to occur in upland disturbed sites include spotted knapweed, common burdock, wild parsnip, common St. John's-wort, bull thistle, common tansy, leafy spurge, smooth brome, Japanese honeysuckle, Canada thistle, and sweetclover. Species known to occur with the wetland disturbed sites include marsh thistle, reed canary grass, and common reed grass. Most of the upland and wetland NNIP are restricted to the existing, open canopy utility corridor and are seldom observed in the adjacent, closed canopy forest.

3.7.5 Proposed Action

3.7.5.1 Direct and Indirect Effects

According to the HNF NNIP Environmental Assessment, non-native invasive plants can affect ecosystems on the Forest by altering communities, nutrient cycling, hydrology and natural fire regimes. They can compete directly for light, water, nutrients, growing space, and by allelopathic interactions (USDA 2007a, p. 5 and USDA 2005, p. 231). The removal of forest canopy and soil disturbing activities may provide suitable habitat for NNIP seeds to germinate and new populations to become established (USDA 2007a, p. 5). Because existing NNIP populations are already established within the project area, if left unmanaged, it is likely they would continue to increase and spread to non-infested areas. The implementation of the project design criteria and BMPs employed by construction and maintenance crews will reduce the risk of spreading NNIP. Project-related activities, including canopy removal, temporary access road construction and installation of poles and wires are vectors for transportation and subsequent introduction of NNIP into non-infested areas. Their potential impacts are discussed separately below.

Canopy removal

The 30-foot offset would require use of approximately 20 feet of additional corridor on the side of the offset. Approximately 32.5 acres of forested or shrub-covered land would need to be cleared for construction and would subsequently be maintained as herbaceous or shrub habitat while the line is in operation. Table 3.7.1 summarizes the forest clearing by MA, forest type and acreage. Mechanical equipment has the potential to transport seeds and plant parts into and throughout the proposed expansion area. Additionally, the removal of canopy cover may create soil and light conditions conducive to establishing and spreading NNIP. Soil disturbance and removal of competition from other native plants provides an opportunity for NNIP to establish. The level of soil disturbance from canopy removal is directly related to the amount of trees and shrubs removed, what equipment is used, and the time of year. The design criteria require winter work and/or tree removal by hand (chainsaw) in sensitive areas to minimize soil disturbance and the potential for the establishment of NNIS. The use of equipment during snow-on conditions would also help to reduce soil disturbance and subsequent NNIP invasion. In addition, areas of exposed soil would be seeded with appropriate cover crops and/or native vegetation to promote the reestablishment of native plant species and reduce the chances of NNIP establishment.

Table 3.7-1. List of Forest Type by Management Area and acres that would be cleared for construction.

MA	Forest Type	Acres
1.2	White Cedar	0.9
1.2	White Cedar - Aspen - Paper Birch	0.7
1.2	Quaking Aspen	1.9
1.2	Non-Forested	1.8
4.5	White Cedar	1.6
4.5	White Cedar - Aspen - Paper Birch	2.8
4.5	Quaking Aspen	1.4
4.5	Non-Forested	3.4
6.4	Red Pine	0.2
6.4	White Cedar	2.7
6.4	Swamp Conifer	3.2
6.4	Red Maple - wet site	<0.1
6.4	Aspen - White Spruce - Balsam Fir	0.6
6.4	Lowland Shrubs	0.7
6.4	Non-Forested	7.8
8.4.2	Black Spruce	0.1
8.4.2	Paper Birch	0.2
8.4.2	Aspen - White Spruce - Balsam Fir	0.3
8.4.2	Non-Forested	2.1
Total		32.5

NOTE: These acres were calculated by GIS. The actual acres may vary slightly

Access Road Construction

Access road use and construction, whether temporary or permanent, provides a vector for spreading NNIP throughout the proposed project area. Soil disturbance and removal of competition from other native plants related to access road use and construction provides an opportunity for NNIP to establish. Additionally, the movement of mechanical equipment along the access roads can be a direct input of NNIP seeds and/or plant parts (USDA 2007a, p.5). Based on the access shown on the Proposed Action maps in Appendix A within the HNF and assuming a 10-foot wide access path, approximately 19.6 acres within the HNF would be affected by access. Depending on field conditions the level of disturbance related to access would range from crushed vegetation to exposed soil, rutting and soil compaction. The use of construction matting in wet areas would reduce rutting and soil compaction, although the vegetation under mats would be crushed. Areas of exposed soil would be seeded with appropriate cover crops and/or native vegetation to promote the reestablishment of native plant species and reduce the chances of NNIP establishment.

Several design criteria would be implemented to reduce the spread of NNIP. Project design criteria require trees or shrubs adjacent to roadsides be retained to the extent feasible to maintain shade and reduce establishment of NNIP. In the short-term (0-5 years), there would be a likely temporary increase in NNIP along roadsides in response to disturbance of native plant communities. Temporary roads would be closed when construction is completed, and the risk of weed introduction would then decrease as the forest cover regenerates. In the long-term (5-15 years), shaded conditions would return, thereby reducing the suitable conditions for shade intolerant NNIP species, specifically spotted knapweed, common St. John's-Wort, and sweetclover.

Installation of Poles and Wires

Ground disturbance associated with pole installation and vehicle movement along the corridor would allow for introduction and establishment of NNIP. In locations where poles would be direct embed structures, the gravel or crush stones could be an additional source of NNIP. In general ground disturbance activities would be kept to a minimum in order to reduce the amount of suitable habitat for germination of NNIP seeds.

3.7.5.2 Cumulative Effects

All of the projects listed in Section 3.2 occur within the analysis area. These projects include soil disturbing activities including equipment travel, timber harvest, road construction, and maintenance which may all provide suitable conditions for the spread and establishment of NNIP. Vulnerability to NNIP invasion and establishment is greatly influenced by existing plant cover, soil disturbance, and overstory shade. These factors vary widely across the cumulative effects boundary.

Some NNIP species are still expanding their ranges into the cumulative effects area. In the project area, there would be a continuing risk over the next 5 years that weed species new to the local area would be introduced. Species such as Japanese barberry and garlic mustard are

not currently known to occur in the project area. These species may be introduced either by long distance transport by equipment of all kinds or by gradual expansion of established populations by natural means. The Proposed Action would contribute to this cumulative effect by the creation of conditions favorable for establishment and transport. This risk would increase in proportion to the use of recreational, road building, construction, or logging equipment in the area that may carry soil, plant parts, or seeds from an infested area. Consequences of introduction and spread of new species could include loss of habitat for native plant species and other species dependant on these plants.

Regardless of project activities, infestations of NNIP would continue to exist at various densities and population sizes. Non-native invasive plants would continue to spread in the project area as a result of present and reasonably foreseeable actions of HNF and private lands. The effects of NNIP would continue to be concentrated in developed or disturbed areas, as opposed to undeveloped forest lands. Most invasive plants occupy disturbed sites; therefore projects that create soil disturbance can facilitate their spread. As NNIP spread through the forest, infestation at formerly uninfested sites becomes more likely, and control becomes more difficult and expensive. Therefore, maintenance of infestations at their current levels is expected to require increasing effort in the future as NNIP spread elsewhere. The cumulative effects of current conditions and ongoing activities result in a moderate vulnerability to NNIP invasion.

3.7.6 Alternative 1-No Action

3.7.6.1 Direct and Indirect Effects

Under the No Action Alternative, no additional ROW would be cleared and only existing ATC Line/ROW maintenance would occur and continue into the foreseeable future. This action would result in moderate risk of NNIP spread where maintenance activities took place and along travel routes used to get there. Existing ROW access road maintenance and control of NNIP would continue at its present level. Weed infestations would likely remain at approximately their current levels, since no new areas would be disturbed. Non-native invasive plants spread would still likely to continue at the current rate along OHV trails, existing access roads and disturbed openings despite control efforts.

3.7.6.2 Cumulative Effects

The No Action Alternative represents the current base line condition including vegetation management and other maintenance activities. The continuation of ongoing management activities along the ROW would maintain the existing vegetative condition and disturbance regime and thus have no cumulative effects when added to the other reasonably foreseeable projects analyzed.

3.8 Threatened, Endangered, and Sensitive Species

3.8.1 Introduction

The scope of this threatened, endangered and sensitive species (TES) analysis focuses on the effects of the Proposed Action on those species potentially present within the project corridor and includes those species listed on the Regional Forester Sensitive Species (RFSS) list for the HNF. Comments regarding TES were received from the US Fish & Wildlife Service. This analysis summarizes findings of the project Biological Evaluations that were prepared to evaluate consistency with state and federal protective regulations. The summary considers the results of those evaluations in terms of Forest Plan guidance for TES management.

3.8.2 Analysis Methods

The U.S. Fish and Wildlife Service (USFWS) Section 7 Consultation website was used to develop a list of current federally listed threatened, endangered or candidate species and designated critical habitat potentially occurring in Mackinac and Chippewa counties (USFWS 2010).

The following surveys have been completed within the project corridor:

- Larval habitat assessment and aerial adult survey for Hine's emerald dragonfly (HED) (fieldwork completed August 2009, June and July 2010)
- Terrestrial gastropod survey (fieldwork completed 2009)
- Winter track surveys for gray wolf and Canada lynx (fieldwork completed January and February 2010)
- Botanical surveys (fieldwork July 2009, September 2009, May 2010, June 2010)
- Northern goshawk and red-shouldered hawk survey (fieldwork completed April and June 2010)
- Breeding bird survey (fieldwork June 2010)

Background information for each of the federally-listed and RFSS-listed species (USDA 2008) was compiled and habitat requirements were evaluated. Preliminary habitat assessments and field surveys were conducted in the project corridor to identify individual species and suitable habitat. Proposed activities were then evaluated to determine whether, in the case of federally-listed species present or unoccupied habitat, those activities would have no effect, be unlikely to adversely affect, or have an effect on the species in question. For RFSS determinations were made regarding viability and the potential for federal listing.

Table 3.8-1 lists all federally listed species with the potential to occur within Mackinac and Chippewa counties in Michigan based on available habitat information and results of field investigations. Table 3.8-2 lists all the RFSS species with the potential to occur in areas affected by the project within the two counties based on available habitat information and results of field investigations.

3.8.3 Analysis Areas

The boundaries for direct and indirect effects varies by species or groups of species. The Federal Species Biological Assessment (BA) and RFSS Biological Evaluations (BE) for TES species provide the specific rationales for the analysis areas of each species considered.

In general, the spatial boundary for the direct and indirect effects on plants and mollusks incorporates the existing ATC ROW in addition to approximately 20 feet of additional ROW immediately adjacent to the new line offset. For wildlife, except mollusks, the analysis area included the project corridor plus a one mile area around the corridor. This is the area that direct effects (vegetation clearing and construction activities) and indirect effects (visual and noise impacts) to wildlife are anticipated.

With the exception of those wildlife species that rely on tree cover for foraging and habitat, the temporal boundary for direct and indirect effects on wildlife is approximately 5 years after construction, which corresponds to the expected time for permanent vegetation communities to become reestablished. Those effects associated with tree clearing and subsequent changes to the microclimate of the adjacent forest are expected to be permanent as long as the ROW is maintained in an open condition.

The spatial boundary for cumulative effects of the Proposed Action was the Land Type Associations (LTA) that overlap with the project corridor. The LTAs are ecological units that describe areas of common ecosystem characteristics and generally (but not always) numbering in the thousands of acres. LTAs are defined by similarities in general topography, geomorphic process, geology, soil and potential plant community patterns (USDA 2006, p. E-6). The temporal boundary for cumulative effects of the proposed expansion is approximately 5 years after construction, which corresponds to the expected time for reestablishment of natural vegetation along the corridor. After this time period the direct and indirect effects of the proposed action are not expected to contribute to cumulative effects.

3.8.4 Affected Environment

The affected environment consists of a variety of landforms and soil and moisture conditions supporting vegetative communities of numerous compositions and structures. These habitats are described in detail in the soils, watershed, and vegetation sections of this EA as well as in Federal Species BA (USDA 2011a), RFSS Wildlife BE (USDA 2011b), and RFSS Botanical BE (USDA 2011c).

3.8.5 Proposed Action

The results of the habitat analysis for each of the federally-listed species and a summary of effects determinations are shown in Table 3.8-1 and discussed in detail in the Federal Species BA (USFWS 2010). Three federally listed species, the Hine's emerald dragonfly, gray wolf and Houghton's goldenrod, were identified within or adjacent to the Project Corridor ("occupied habitat"). Suitable habitat exists within or adjacent to the Project Corridor for three federally listed species, the Michigan monkeyflower, dwarf lake iris and Canada lynx, but presence has not been reported ("unoccupied habitat"). No suitable habitat was identified within or adjacent to

the Project Corridor for the following six federally listed species: Kirtland's warbler, Piping plover, pitcher's thistle, American hart's tongue fern, and lakeside daisy (USDA 2011a).

Table 3.8-1. Habitat Evaluation and Effects Determination for Federally Listed Threatened or Endangered Species with the Potential to Occur in Mackinac and/or Chippewa Counties, Michigan

Scientific Name	Common Name	Federal Status	Suitable Habitat Present (Y or N)	Known Occupied Habitat (Y or N)	Effects Determination ¹
Insects					
<i>Somatochlora hineana</i>	Hine's emerald dragonfly	Endangered	Y	Y	NLAA
Birds					
<i>Charadrius melodus</i>	Piping plover	Endangered	N	N	NE
<i>Dendroica kirtlandii</i>	Kirtland's warbler	Endangered	N	N	NE
Mammals					
<i>Canis lupus</i>	Gray wolf	Endangered	Y	Y	NLAA
<i>Lynx canadensis</i>	Canada lynx	Threatened	Y	N	NLAA
Plants					
<i>Mimulus glabratus</i> var. <i>michiganensis</i>	Michigan monkeyflower	Endangered	Y	N	NLAA
<i>Asplenium scolopendrium</i> var. <i>americanum</i>	American hart's tongue fern	Threatened	N	N	NE
<i>Cirsium pitcheri</i>	Pitcher's thistle	Threatened	N	N	NE
<i>Hymenoxys herbacea</i>	Lakeside daisy	Threatened	N	N	NE
<i>Iris lacustris</i>	Dwarf lake iris	Threatened	Y	N	NLAA
<i>Solidago houghtonii</i>	Houghton's goldenrod	Threatened	Y	Y	NLAA

¹ NE=No Effect; NLAA= Not Likely to Adversely Affect

A summary of the habitat evaluation and effects determinations for each of the RFSS-listed wildlife species is included in Table 3.8-2 (USDA 2008, USDA 2011a). The federally listed species are also on the RFSS list. To limit redundancy, the federally listed species are not include on Table 3.8-2 or discussed with the other RFSS species since they were listed on Table 3.8-1 and summarized above. Four RFSS-listed mollusks (land snails), one insect (warpaint emerald dragonfly), and one bird (Bald eagle) with suitable habitat were documented within the corridor or are known to occur within or adjacent to the Project Corridor. In addition suitable habitat for one RFSS mollusk, three insects (green-faced clubtail, ebony boghaunter and ringed boghaunter), one reptile (Blanding's turtle), and seven birds (Short-eared owl, Red-shouldered hawk, Northern goshawk, LeConte's sparrow, Black-crowned night heron, Connecticut warbler and Black-backed woodpecker) occurs within the Project Corridor (USDA 2011b).

Table 3.8-2. Habitat Evaluation and Effects Determination for Regional Forester Sensitive Species (Wildlife Species)

Scientific Name	Common Name	Status	Habitat in Project Area (Y/N)	Documented in Project Area (Y/N)	Effects Determination ¹ (Proposed Action)
Mollusks					
<i>Vallonia gracilicosta albula</i>	A land snail (no common name)	RFSS	N	N	NI
<i>Vertigo morsei</i>	A land snail (no common name)	RFSS	Y	Y	MINL
<i>Catinella exile</i>	Pleistocene catinella	RFSS	Y	N	MINL
<i>Euconulus alderi</i>	A land snail (no common name)	RFSS	Y	Y	MINL
<i>Vertigo bollesiana</i>	Delicate vertigo	RFSS	Y	Y	MINL
<i>Planogyra asteriscus</i>	Eastern flat-whorl	RFSS	Y	Y	MINL
<i>Vertigo paradoxa</i>	Myserty vertigo	RFSS	N	N	NI
Insects					
<i>Lycaeides idas nabokovi</i>	Northern blue butterfly	RFSS	N	N	NI
<i>Trimerotropis huroniana</i>	Lake Huron locust	RFSS	N	N	NI
<i>Hylogomphus viridifrons</i>	Green-faced clubtail	RFSS	Y	N	MINL
<i>Somatochlora incurvata</i>	Warpaint emerald dragonfly	RFSS	Y	N	MINL
<i>Williamsonia fletcheri</i>	Ebony boghaunter	RFSS	Y	N	MINL
<i>Williamsonia linteri</i>	Ringed boghaunter	RFSS	Y	N	MINL
Fish					
<i>Acipenser fulvescens</i>	Lake sturgeon	RFSS	N	N	NI
Reptiles					
<i>Emydoidea blandingii</i>	Blanding's turtle	RFSS	Y	N	MINL
Birds					
<i>Asio flammeus</i>	Short-eared owl	RFSS	Y	N	MINL
<i>Dendroica discolor</i>	Prairie warbler	RFSS	N	N	NI
<i>Falco peregrinus</i>	American peregrine falcon	RFSS	N	N	NI
<i>Lanius ludovicianus migrans</i>	Migrant loggerhead shrike	RFSS	N	N	NI
<i>Buteo lineatus</i>	Red-shouldered hawk	RFSS	Y	N	MINL
<i>Coturnicops noveboracensis</i>	Yellow rail	RFSS	N	N	NI
<i>Cygnus buccinators</i>	Trumpeter swan	RFSS	N	N	NI
<i>Gavia immer</i>	Common loon	RFSS	N	N	NI
<i>Haliaeetus leucocephalus</i>	Bald eagle	RFSS	Y	Y	MINL
<i>Sterna caspia</i>	Caspian tern	RFSS	N	N	NI
<i>Sterna hirundo</i>	Common tern	RFSS	N	N	NI
<i>Accipiter gentilis</i>	Northern goshawk	RFSS	Y	N	MINL

Table 3.8-2. Habitat Evaluation and Effects Determination for Regional Forester Sensitive Species (Wildlife Species)

Scientific Name	Common Name	Status	Habitat in Project Area (Y/N)	Documented in Project Area (Y/N)	Effects Determination ¹ (Proposed Action)
<i>Ammodramus leconteii</i>	LeConte's sparrow	RFSS	Y	N	MINL
<i>Chlidonias niger</i>	Black tern	RFSS	N	N	NI
<i>Nycticorax nycticorax</i>	Black-crowned night heron	RFSS	Y	N	MINL
<i>Opororonis agilis</i>	Connecticut warbler	RFSS	Y	N	MINL
<i>Picoides arcticus</i>	Black-backed woodpecker	RFSS	Y	N	MINL
<i>Tympanuchus phasianellus</i>	Sharp-tailed grouse	RFSS	N	N	NI

¹ NI=No Impact, MINL=May Impact Individuals but is Not Likely to Cause a Trend to Federal Listing or Loss of Viability

The RFSS list for HNF includes 82 vascular plants and 9 non-vascular plants (USDA 2008). To evaluate the effects of the Proposed Action on RFSS plant species, each species was placed into a group determined by general habitat types. For the purposes of this evaluation, those habitat types include aquatic habitat, open/wet habitat, open/dry to moist habitat, shaded/wet habitat and shaded/dry to mesic habitat. Effects determinations for each of the RFSS-listed plant species (by habitat) are shown in Table 3.8-3 (USDA 2011c).

Table 3.8-3. Habitat Evaluation and Effects Determination for Regional Forester Sensitive Species (Botanical Species)

Scientific Name	Common Name	Status ¹	Habitat in Project Area (Y/N)	Documented in Project Area (Y/N)	Effects Determination ¹ (Proposed Action)
Aquatic Habitat					
<i>Armoracia lacustris</i>	Lake cress	RFSS	Y	N	MINL
<i>Callitriche hermaphrodita</i>	Autumnal water-starwort	RFSS	Y	N	MINL
<i>Littorella uniflora</i>	American shoregrass	RFSS	Y	N	MINL
<i>Myriophyllum alterniflorum</i>	Alternate-flowered water milfoil	RFSS	Y	N	MINL
<i>Potamogeton confervoides</i>	Algal pondweed	RFSS	Y	N	MINL
Open/Wet Habitat					
<i>Beckmannia syzigachne</i>	American sloughgrass	RFSS	Y	N	MINL
<i>Carex scirpoidea</i>	Bulrush sedge	RFSS	Y	N	MINL
<i>Carex wiegandii</i>	Wiegand's sedge	RFSS	Y	N	MINL
<i>Drosera anglica</i>	English sundew	RFSS	Y	N	MINL
<i>Eleocharis compressa</i>	Flattened spikerush	RFSS	Y	N	MINL
<i>Empetrum nigrum</i>	Black crowberry	RFSS	Y	N	MINL
<i>Erigeron hyssopifolius</i>	Hyssop-leaved fleabane	RFSS	Y	N	MINL

Table 3.8-3. Habitat Evaluation and Effects Determination for Regional Forester Sensitive Species (Botanical Species)

Scientific Name	Common Name	Status ¹	Habitat in Project Area (Y/N)	Documented in Project Area (Y/N)	Effects Determination ¹ (Proposed Action)
<i>Huperzia selago</i>	Fir clubmoss	RFSS	Y	N	MINL
<i>Juncus stygius</i>	Moor rush	RFSS	Y	N	MINL
<i>Juncus vaseyi</i>	Vasey's rush	RFSS	Y	N	MINL
<i>Lycopodiella margueritae</i>	Northern prostrate club moss	RFSS	Y	N	MINL
<i>Muhlenbergia richardsonis</i>	Mat Muhly	RFSS	Y	Y	MINL
<i>Packera indecora</i>	Plains ragwort	RFSS	Y	N	MINL
<i>Petasites sagittatus</i>	Sweet-coltsfoot	RFSS	Y	N	MINL
<i>Pinguicula vulgaris</i>	Butterwort	RFSS	Y	N	MINL
<i>Rubus acaulis</i>	Dwarf raspberry	RFSS	Y	N	MINL
<i>Salix pellita</i>	Satiny willow	RFSS	Y	N	MINL
<i>Schoenoplectus torreyi</i>	Torrey's bulrush	RFSS	Y	N	MINL
Open/Dry to Moist Habitat					
<i>Astragalus canadensis</i>	Canadian milk-vetch	RFSS	N	N	NI
<i>Astragalus neglectus</i>	Cooper's milk-vetch	RFSS	N	N	NI
<i>Botrychium campestre</i>	Prairie moonwort	RFSS	Y	N	MINL
<i>Botrychium michiganense</i>	Michigan moonwort	RFSS	Y	N	MINL
<i>Botrychium pallidum</i>	Pale moonwort	RFSS	N	N	NI
<i>Botrychium rugulosum</i>	Ternate grape fern	RFSS	Y	N	MINL
<i>Botrychium spathulatum</i>	Spathulate moonwort	RFSS	Y	N	MINL
<i>Carex richardsonii</i>	Richardson sedge	RFSS	N	N	NI
<i>Elymus glaucus</i>	Blue wild-rye	RFSS	N	N	NI
<i>Helianthus mollis</i>	Downy sunflower	RFSS	N	N	NI
<i>Leymus mollis</i>	Dune grass	RFSS	N	N	NI
<i>Piptatherum canadense</i>	Canada rice-grass	RFSS	Y	N	MINL
<i>Sporobolus heterolepis</i>	Prairie dropseed	RFSS	N	N	NI
<i>Stellaria longipes</i>	Long-stalked stitchwort	RFSS	N	N	NI
<i>Stereocaulon condensatum</i>	Foam lichen	RFSS	Y	N	MINL
<i>Thalictrum venulosum</i> v. <i>confine</i>	Veiny meadow rue	RFSS	N	N	NI
<i>Vaccinium cespitosum</i>	Dwarf bilberry	RFSS	Y	N	MINL
Shaded/Wet Habitat					
<i>Ahtiana aurescens</i>	Eastern candlewax lichen	RFSS	Y	N	MINL
<i>Amerorchis rotundifolia</i>	Round-leaved orchis	RFSS	Y	N	MINL
<i>Caloplaca parvula</i>	Small firedot lichen	RFSS	Y	N	MINL
<i>Calypso bulbosa</i>	Calypso orchid	RFSS	Y	N	MINL
<i>Carex heleonastes</i>	Hudson Bay sedge	RFSS	Y	N	MINL

Table 3.8-3. Habitat Evaluation and Effects Determination for Regional Forester Sensitive Species (Botanical Species)

Scientific Name	Common Name	Status ¹	Habitat in Project Area (Y/N)	Documented in Project Area (Y/N)	Effects Determination ¹ (Proposed Action)
<i>Cypripedium arietinum</i>	Ram's head lady slipper	RFSS	Y	N	MINL
<i>Frullania selwyniana</i>	Liverwort	RFSS	Y	N	MINL
<i>Galium brevipes</i>	Northern three-lobed bedstraw	RFSS	Y	N	MINL
<i>Gymnocarpium robertianum</i>	Limestone oak fern	RFSS	Y	Y	MINL
<i>Listera auriculata</i>	Auricled twayblade	RFSS	Y	N	MINL
<i>Luzula parviflora</i>	Small flowered wood rush	RFSS	Y (does not occur in Eastern UP)	N	MINL
<i>Malaxis brachypoda</i>	White adder's mouth	RFSS	Y	N	MINL
<i>Menegazzia terebrata</i>	Porthole lichen	RFSS	Y	N	MINL
<i>Pohlia lescuriana</i>	Spongy gourd moss	RFSS	Y	N	MINL
<i>Ranunculus lapponicus</i>	Lapland buttercup	RFSS	Y	N	MINL
Shaded/Dry to Mesic Habitat					
<i>Adlumia fungosa</i>	Allegheny vine	RFSS	Y	N	MINL
<i>Asplenium rhizophyllum</i>	Walking fern	RFSS	N	N	NI
<i>Asplenium trichomanes ramosum</i>	Green spleenwort	RFSS	N	N	NI
<i>Botrychium mormo</i>	Goblin moonwort	RFSS	Y	N	MINL
<i>Botrychium oneidense</i>	Blunt-lobed grapefern	RFSS	Y	N	MINL
<i>Carex concinna</i>	Beauty sedge	RFSS	N	N	NI
<i>Carex novae-angliae</i>	New England sedge	RFSS	Y	N	MINL
<i>Crataegus douglasii</i>	Douglas's hawthorn	RFSS	Y	N	MINL
<i>Cryptogramma stelleri</i>	Slender cliff brake fern	RFSS	N	N	NI
<i>Cynoglossum virginianum</i> var. <i>boreale</i>	Northern wild comfrey	RFSS	Y	N	MINL
<i>Cystopteris laurentiana</i>	Laurentian bladder fern	RFSS	N	N	NI
<i>Dryopteris expansa</i>	Spreading wood fern	RFSS	Y	N	MINL
<i>Dryopteris filix-mas</i>	Male fern	RFSS	Y	N	MINL
<i>Galium kamtschaticum</i>	Boreal bedstraw	RFSS	Y	N	MINL
<i>Juglans cinerea</i>	Butternut	RFSS	Y	N	MINL
<i>Omalotheca sylvatica</i>	Woodland cudweed	RFSS	Y (does not occur in Eastern UP)	N	MINL
<i>Pterospora andromeda</i>	Pine drops	RFSS	Y	Y	MINL
<i>Ramalina farinacea</i>	Dotted line lichen	RFSS	Y	N	MINL
<i>Schistostega pennata</i>	Schistostega moss	RFSS	Y	N	MINL
<i>Tetradontium mbrownianum</i>	Little Georgia moss	RFSS	Y	N	MINL

¹ NI=No Effect, MINL=May Impact Individuals but is Not Likely to Cause a Trend to Federal Listing or Loss of Viability

3.8.5.1 Direct and Indirect Effects

Effects to wildlife and plant species are described in detail for each listed species in the Federal Species BA, the RFSS Wildlife Species BE, and the RFSS Botanical Species BE. The Proposed Action was designed to avoid and minimize effects to listed species and their habitats to the extent practicable and the project specific design criteria would be implemented to further avoid or minimize effects. The anticipated direct and indirect effects to listed species are summarized below.

3.8.5.1.1 Federally-Listed Species

Hines Emerald Dragonfly

The Proposed Action was designed to avoid direct impacts to HED larval habitat. The design criteria restrict construction activities in the wetland complexes associated with suitable HED larval habitat to the winter months when adults are not present and larvae are in crayfish burrows (USFWS 2001, p13). As such, direct effects to HED adults or larvae are not anticipated. The Proposed Action may result in indirect effects to HED adults primarily through permanent forest and shrub clearing that reduces the buffer zone between suitable HED larval habitat and existing roads which could increase their exposure to potential vehicle collisions. Because the existing forested buffer is less than 328 feet (100 meters), HED adults likely already move back and forth between the existing ROW and roads (USDA 2011a, pp 12-13). Additional clearing is not likely to appreciably change their behavior or exposure to vehicle collisions. The Proposed Action may result in indirect effects to HED larvae from new pole placement, removal of existing structures, and vehicle access and/or placement of mats in the wetlands adjacent to the suitable larval habitat areas and streamlets, as well as the placement of temporary clear span bridges over streamlets and larval habitat areas. The implementation of design criteria should minimize the potential indirect impacts (USDA 2011a, pp 11-14).

Hines Emerald Dragonfly Critical Habitat

Approximately 6.5 miles of the project crosses or is immediately adjacent to portions of designated HED Critical Habitat Units 1 and 2 in Michigan. HED Critical Habitat Primary Constituent Elements (PCE) include (75 FR 21394-21453):

1. Organic soils (histosols, or with organic surface horizon) overlaying calcareous substrate (predominantly dolomite and limestone bedrock).
2. Calcareous water from intermittent seeps and springs and associated shallow, small, slow flowing streamlet channels, rivulets, and/or sheet flow within fens.
3. Emergent herbaceous and woody vegetation for emergence facilitation and refugia.
4. Occupied burrows maintained by crayfish for refugia.
5. Prey base of aquatic macroinvertebrates, including mayflies, aquatic isopods, caddisflies, midge larvae, and aquatic worms.

6. Natural plant communities near the breeding/larval habitat which may include fen, marsh, sedge meadow, dolomite prairie, and the fringe (up to 328 ft [100 m]) of bordering shrubby and forested areas with open corridors for movement and dispersal.
7. Prey base of small flying insect species (e.g., dipterans).

Of the PCE listed above, 1-5 apply to larval habitat, while 6 and 7 apply to adult habitat. Each of the larval habitat areas identified contain some or all of the larval PCEs and areas adjacent to them were determined to contain one or both adult PCEs. Direct effects to HED larval PCEs are not anticipated as they will be avoided through implementation of the design criteria. New pole placement, removal of existing structures, vehicle access, and placement of mats or bridges in wetlands adjacent to the larval habitat areas could cause indirect effects to HED larval PCEs. These activities could cause sedimentation from nearby ground disturbance; pollution or contamination; changes to hydrology of larval habitat due to soil compaction, changes in surface water flow, or ponding of water; or vegetation disturbance that could allow the spread of NNIP into suitable habitat. The implementation of the design criteria would minimize these direct effects.

Direct effects to HED adult PCEs would occur in the form of permanent loss of adult sheltering areas through vegetation clearing of the new ROW. However, indirect effects to adult PCEs would occur in the form of gaining new breeding and feeding opportunities in cleared areas of the new ROW, as well as gaining future sheltering areas through natural succession and revegetation of the abandoned ROW. Shrub and forest cover along the Project Corridor would be cleared to provide new ROW. The permanent clearing of HED adult sheltering habitat along the new ROW would be reduced by 20 feet; however, the clearing would not eliminate the PCE from the area (i.e. forest and shrub cover would still exist along the Project Corridor). The newly cleared area would be maintained and those wetland areas adjacent to existing suitable habitat would likely become emergent wetland habitat that may provide suitable breeding and feeding opportunities for adult HED. In addition, 40 feet of existing ROW opposite the new ROW would be abandoned and allowed to naturally revegetate. Eventually, areas not too wet for tree and shrub growth would return to natural forest or shrub cover and would provide adult HED sheltering habitat (USDA 2011a, pp 14-16).

Gray Wolf

Direct effects (mortality) to the gray wolf as a result of the Proposed Action are unlikely. The following indirect effects may occur. Travel corridors used by the gray wolf and its primary prey animal, white-tailed deer (*Odocoileus virginianus*), may be temporarily cut off during the Proposed Action due to construction activities, altering how the wolves and its prey utilize the corridor (MDNR 1997). Tree clearing activities may result in increased winter browse activity by white-tailed deer feeding on leaves of cut limbs and branches, which could also attract wolves to the corridor. Tree clearing adjacent to the existing ROW would result in a loss of suitable gray wolf habitat, which is found primarily within the boreal forest communities adjacent to the existing ROW. The corridor would be approximately 20 feet wider, potentially altering how wolves utilize the corridor as a travel route, hunting area or a territorial boundary. As forested

habitat reclaims the 40 feet of abandoned ROW, young northern white-cedar trees would provide forage for white-tailed deer, potentially attracting wolves to the area. A wider corridor and loss of a forested buffer zone between the corridor and roadways may also impact wolf movement and territorial boundaries across the landscape temporarily. However, over time the 40 feet of abandoned ROW would revegetate to forest and shrub cover, which would provide similar or improved travel corridors, movement opportunities, and or territorial boundaries for wolves (USDA 2011a, pp 16-18).

Canada Lynx

Direct effects (mortality) to the Canada lynx as a result of the Proposed Action are unlikely. The following indirect effects may occur as a result of the Proposed Action if the Canada lynx is present in the project area. Travel corridors used by the Canada lynx and its prey animals may be temporarily cut off during construction altering how the lynx and its prey utilize the corridor. Post-construction the corridor would be approximately 20 feet wider until the 40 feet of abandoned corridor revegetate, potentially altering how lynx utilize the corridor as a travel route, hunting area or a territorial boundary. The 40 feet of abandoned ROW would provide an increase in suitable habitat for snowshoe hare, the lynx primary prey species, as forest becomes reestablished. A wider corridor and loss of a forested buffer zone between the corridor and roadways may also impact lynx movement and territorial boundaries across the landscape (USDA 2011a, pp 18-19).

Plants

There would be no direct effects to federally-listed plant species with the implementation of design criteria (USDA 2011a). Indirect effects may include the establishment of invasive species as a result of construction activities (e.g. disturbance or clearing of trees). Non-native invasive plants can compete directly for light, water, nutrients, growing space, and by allelopathic interactions (USDA 2007a). Efforts to minimize the spread or introduction of non-native species include the utilization of certified weed-free gravel and weed-free hay or straw mulch.

3.8.5.1.2 Regional Forester Sensitive Species

Direct and indirect effects to RFSS snail species (Table 3.8-2) may occur as a result of the Proposed Action. Direct mortality can occur to snail species as a result of construction activities. The implementation of the project specific design criteria, including winter construction, the use of construction mats, and minimizing access in sensitive resources areas, would reduce direct impacts to snail species in those areas. Loss or alteration to habitat can have indirect effects to the RFSS snail species. Clearing of additional ROW may be beneficial for species that favor the habitat within the ROW. Species that favor habitat in loose soils of undisturbed forested edges could be affected by loss of habitat from the clearing of additional ROW. Alterations to site hydrology and changes in soil structure from construction equipment could also affect land snails through loss of suitable habitat. The abandoned 40 feet of ROW

after project completion would be allowed to regenerate naturally, providing suitable forested edge habitat for snail species over time (USDA 2011b, pp 14-15).

Direct and indirect effects to RFSS insect species could result from the Proposed Action. Direct mortality may occur to individuals as a result of collision with construction equipment. Construction activities in many wetlands would occur in winter and larvae in the soil or water of wetlands could be destroyed by compression from wetland mats and vehicle traffic. Compaction of wetland soils and alterations to wetland hydrology caused by construction activities could have indirect effects on dragonfly habitat. Temporary effects to vegetation could also affect larvae and adults by limiting perching areas. The implementation of the project specific design criteria, including winter construction, the use of construction mats, and minimizing access in sensitive resources areas, would reduce direct and indirect impacts to insect species (USDA 2011b, pp 15-17).

Direct and indirect effects to Blanding's turtle may occur as a result from the Proposed Action. Direct mortality can occur as a result of construction vehicles accessing the ROW in wetland habitat areas or in transitional areas where individuals are dispersing to upland mating/nesting sites. Noise, timber matting in wetland habitats and other construction activities could disturb Blanding's turtle dispersal to upland sites. Construction activities within the ROW could result in temporary loss of vegetative cover in wetlands and open upland areas. Clearing and maintaining new ROW can provide new emergent wetland and open upland habitat that could benefit Blanding's turtle. Implementation of the design criteria, including the 100-foot riparian buffer and winter construction in many of the wetlands would minimize the potential for direct mortality and impacts to suitable Blanding's turtle habitat (USDA 2011b, pp 17-18).

Two RFSS-listed plant species, limestone oak fern and mat muhly, are known to occur within the project area on the HNF. Design criteria, including 100-foot buffers around known occurrences, would be implemented to minimize the potential for impacts to these species (USDA 2011c).

3.8.5.2 Cumulative Effects

The potential for cumulative effects to TES and RFSS species was analyzed using the Section 3.2 project list. BEs for Rudyard, Niagara, and Sprinkler had no activities resulting in adverse effects for TES and no more than minor effects to individuals in the case of RFSS. The Draft EA for the Shores project, which has not yet been approved, indicates similar findings. Therefore, rebuild of the transmission line would not have any cumulative effects to either TES or RFSS when combined with those four HNF projects.

The greatest potential for cumulative effects is related to the Peninsula Fiber Optic Project (PFOP). The PFOP would run along the east side of Mackinac Trail through an area designated as Critical Habitat for the Hines Emerald Dragonfly. However, according to the project description and analysis contained in the HNF project file, installation of the line would occur in the area filled for the road and installation would occur with a trencher in upland areas and a boring machine under streams and similar flowages. Therefore, installation of the cable would not affect dragonfly habitat. Because the installation would be right along the road,

equipment use is not likely to result in any greater risk of harming individuals than traffic along the road. Therefore, the fiber optic cable was determined to have no effect to the Hines Emerald dragonfly. The Proposed Action; therefore, would have no cumulative effect to the species.

3.8.6 No Action Alternative

3.8.6.1 Direct and Indirect Effects

Under the No Action Alternative, ATCs special use permit would not be amended and the ESE 6904-6905 powerline rebuild would not occur. The existing line and equipment would remain in service and would be managed using ATC's established operation and maintenance practices. There would be no new ROW clearing or changes in vegetative management practices; therefore, there would be additional no effects beyond the current conditions to wildlife species.

3.8.6.2 Cumulative Effects

There are no direct or indirect effects as part of the No Action alternative; therefore, no cumulative effects would occur.

3.9 Terrestrial Management Indicator Species

3.9.1 Introduction

No comments regarding terrestrial wildlife or terrestrial management indicator species (MIS) were submitted during the scoping period. However, one comment was received expressing a concern with the project's effect on the abundance of shrub habitat for birds. Therefore, the scope of this analysis focuses generally on the effects of the Proposed Action and other alternatives on MIS and other wildlife species with similar habitat requirements. Additional analysis relating to shrub habitat is also provided in order to address the concern regarding that habitat type and management of associated bird species.

3.9.2 Analysis Methods

Stantec (formerly Natural Resources Consulting, Inc. [NRC]) biologists consulted with HNF staff to determine the habitat potential for MIS species within the HNF. Findings from recent field surveys conducted by Stantec project biologists were reviewed. The following surveys have been completed within the project corridor:

- Larval habitat assessment and aerial adult survey for Hine's emerald dragonfly (August 2009)
- Terrestrial gastropod survey (2009)
- Winter track surveys for gray wolf and Canada lynx (February 2010)
- Northern goshawk and red-shouldered hawk survey (April 2010)
- Breeding bird survey (Spring 2010)

Background information for each of the MIS species was compiled and habitat requirements were evaluated. Based on the results of preliminary habitat assessments and field surveys, effects were analyzed for individual MIS species that have the potential to occur within the project corridor.

3.9.3 Analysis Areas

The spatial boundary for the direct and indirect effects on MIS species included the project corridor plus a one mile area around the corridor. This is the area that direct effects (vegetation clearing and construction activities) and indirect effects (visual and noise impacts) to wildlife are anticipated.

The temporal boundary for direct and indirect effects on MIS species is approximately 5 years after construction, which corresponds to the expected time for permanent vegetation communities to become reestablished.

The spatial boundary for cumulative effects of the Proposed Action was the LTA that overlap with the project corridor. The LTAs are ecological units that describe areas of common ecosystem characteristics and generally (but not always) numbering in the thousands of acres. LTAs are defined by similarities in general topography, geomorphic process, geology, soil and potential plant community patterns (USDA 2006, p. E-6). The temporal boundary for cumulative effects of the proposed expansion is approximately 5 years after construction, which

corresponds to the expected time for permanent vegetation communities to become reestablished. After this time period the direct and indirect effects of the proposed action are not expected to contribute to cumulative effects.

3.9.4 Affected Environment

MIS are species whose population changes are thought to indicate the effects of management activities on other wildlife species with similar habitat requirements. There are three terrestrial MIS for the HNF: sharp-tailed grouse, ruffed grouse and American marten (USDA 2006 Appendix B).

Sharp-tailed Grouse

The sharp-tailed grouse is listed as a special concern species within the state of Michigan and is listed as both an RFSS and MIS for the HNF. Populations of this species are currently found in Michigan, Minnesota and Wisconsin. The Upper Peninsula of Michigan represents the eastern-most distribution of the species in the U.S. (Sjogren and Corace 2006, p. 13).

This species prefers pine barrens, burned forest areas and non-forested wetlands and requires early successional habitats with large upland openings consisting of a mixture of cover types, including grasses, forbs, shrubs, young jack pine stands and wetlands. At least 40 acres of low, sparse vegetation is needed to provide adequate lek (breeding) habitat. In Michigan, adult sharp-tails prefer recently burned upland openings with abundant blueberries and occupy a home range of approximately 600 hectares or 1,400 acres (Sjogren and Corace 2006, pp. 11-12). Associated species may include short-eared owl, Kirtland's warbler, black-backed woodpecker and the upland sandpiper, among others (USDA 2006a, Appendix B). There are no known leks or large suitable openings on the HNF in close proximity to the Proposed Actions (USDA 2009).

Ruffed Grouse

The ruffed grouse is a popular game bird throughout much of the eastern United States, including Michigan. Ruffed grouse can be found in many different forest types, although the species prefers deciduous or mixed forest types. Quaking and bigtooth aspen forests can support larger ruffed grouse populations than other forest communities (Dessecker, et.al. 2006, p. 3). Recently clearcut or burned aspen forests commonly reach levels that provide protective cover for ruffed grouse (Dessecker, et.al. 2006, p. 11). Much of the forests adjacent to existing ROW is suitable habitat and ruffed grouse occur in the project area. Associated species may include white-tailed deer, snowshoe hare, American woodcock and golden-winged warbler, among others (USDA 2006a, Appendix B).

American Marten

The American marten commonly inhabits forest communities throughout Canada, but it is generally absent or uncommon throughout most of the United States. However, efforts to recover the American marten have been successful in the Upper Peninsula of Michigan (Frawley 2006, p. 2). This species most often prefers mature northern hardwood forests, and mature coniferous forests. Associated species may include pileated woodpecker, northern goshawk

and gray wolf, among others (USDA 2006a, Appendix B). No marten tracks were observed within the project corridor during the winter track surveys, although martens are likely to occur in the forested areas adjacent to the corridor.

3.9.5 Proposed Action

3.9.5.1 Direct and Indirect Effects

Sharp-tailed Grouse

Following construction activities, which would include the clearing of approximately 32.5 acres for new ROW, open spaces would be created that may provide suitable, early-successional habitat for sharp-tailed grouse. However, the additional habitat created would be a minimal expansion of existing habitat along the corridor that does not presently provide the large upland openings the species prefers.

Ruffed Grouse

Effects to this species could occur as a result of clearing activities. Effects may include abandonment of nests, especially if clearing occurs during the nesting season, and changes in habitat and vegetative cover. The clearing of young aspen stands would result in a slight decrease in habitat for the ruffed grouse. However, regeneration of aspen in some abandoned portions of the existing ROW would increase habitat.

American Marten

Tree clearing activities in mature forest stands during construction would affect the American marten and other species requiring snags and woody debris habitat characteristic of late successional forest communities by slightly reducing this habitat. Removal of trees and loss of marten habitat would be permanent. However, the total area affected would be limited to the approximate 20 foot wide new ROW.

3.9.5.2 Cumulative Effects

Projects involving timber management listed in Section 3.2 include activities that would transition mature aspen stands, which currently serve as winter forage habitat for ruffed grouse, into young aspen brood and breeding cover. The conversion from mature aspen habitat also would remove canopy cover and woody debris, which would reduce American marten habitat. The clearing for the new ROW would result in short term cumulative impacts when added to the timber management activities; however, it is anticipated that the proposed ROW abandonment area would eventually result in a net increase of forested land adjacent to the project corridor. Therefore, implementing the Proposed Action would not have long term cumulative effects.

3.9.6 No Action Alternative

3.9.6.1 Direct and Indirect Effects

Under the No Action Alternative, ATCs special use permit would not be amended and the ESE 6904-6905 powerline rebuild would not occur. The existing line and equipment would remain in service and would be managed using ATC's established operation and maintenance practices.

There would be no new ROW clearing or changes in vegetative management practices; therefore, there would be no effects to wildlife species.

3.9.6.2 Cumulative Effects

There are no direct or indirect effects; therefore, no cumulative effects would occur.

3.10 Fisheries, Aquatic Habitat, and Aquatic MIS

3.10.1 Introduction

No comments relating to fisheries, aquatic habitat, or aquatic MIS were submitted during the project scoping period. There are no proposed activities that specifically target fisheries resources; however, removal of trees and shrubs within the 100-foot riparian buffer is necessary within the 20 foot wide new ROW.

3.10.2 Analysis Methods

This analysis was based on a review of available resources such as the Forest Plan (USDA 2006), Michigan Department of Natural Resources' (MDNR) Maps for Inland Trout and Salmon Fishing (2010), United States Environmental Protection Agency's (USEPA) STORET (2010), and USEPA's Enviromapper for Water (2010). Site visits to the project area's water bodies were also conducted during the summer of 2009 and spring of 2010.

3.10.3 Analysis Area

3.10.3.1 Direct and Indirect Effects Boundaries

The spatial boundary for this analysis is the lakes and waterways within the project's corridor plus the 100-foot riparian buffer. The effects to the water bodies would be limited to slight increases in runoff due to a reduction of precipitation interception caused by the expansion of the transmission line ROW and the removal of woody vegetation for the ROW expansion. Effects of the canopy clearing would persist as long as the transmission line ROW is maintained. The temporal boundary for direct and indirect impacts is anticipated to be five years following the completion of construction. This is the approximate time it would take for shrubby vegetation to regenerate in the riparian buffer zones adjacent to the waterways in ROW abandonment area, which would stabilize the soils and provide shading to the waterways.

3.10.3.2 Cumulative Effects Boundary

The spatial boundary for cumulative effects is the subwatershed associated with each of the waterways. This area represents a natural boundary where reasonably detectable effects may contribute to aquatic habitat cumulative effects. The temporal boundary for cumulative effects is anticipated to be five years following the completion of construction. This is the approximate time it will take for shrubby vegetation to regenerate in the riparian buffer zones adjacent to the waterways in ROW abandonment area, which would stabilize the soils and provide shading to the waterways.

3.10.4 Affected Environment

Several waterways are located in the project corridor. Waterways indicated as having a coldwater fishery by MDNR include Hoban Creek, Rabbit Back Creek, Foley Creek, Martineau Creek, Carp River, McCloud Creek, Home/Garden Hill Creek, Elmhurst Creek, Chub Creek, Pine River, three unnamed tributaries to the Carp River, and an unnamed tributary to Chub Creek (MDNR 2010). All of these waterways are Type 1 trout streams, with the exception of the Carp and Pine rivers, which are Type 4 trout streams. Water quality data for four of the streams

(Carp River, Elmhirst Creek, Garden Hills Creek, and Pine River) was available on STORET (USEPA 2010). The STORET data indicate that, generally speaking, the streams within the project corridor are hard water streams with oligotrophic (low productivity) to mesotrophic (intermediate productivity) nutrient levels.

The typical riparian community within the existing transmission line ROW is wet meadow. Typical riparian communities outside of the existing transmission line ROW are conifer swamp and alder thicket. Substrates of the waterways within the existing transmission line ROW range from gravel and cobble to silty, depending on water velocities.

Platz Lake is the only named lake in the project corridor. It is approximately 8.5 acres in size. Other smaller ponds and shallow open water wetlands are scattered throughout the project corridor. It is unclear if these small bodies of water support any type of fishery. Most of the open water systems in the project corridor are under federal ownership.

Several intermittent waterways are present in the project corridor and do not support a sport fishery in most years, but some do provide valuable habitat for threatened and endangered species, such as the Hines Emerald Dragonfly (HED).

According to the EPA, none of the water bodies in the project corridor are impaired (USEPA 2010).

3.10.4.1 Management Indicator Species (MIS)

Brook trout (Salvelinus fontinalis)

Brook trout is the only native salmonid and is a popular sport fishing species. They are more dependent on cold groundwater input than any other species in the HNF. With the exception of some small headwaters streams, brook trout occur in virtually all waters classified as cold. Highly suitable habitat for a self sustaining brook trout population has these characteristics: maximum daily water temperatures below 68 degrees F, clean spawning gravel, abundant in stream coarse woody debris, low sediment load, and no barriers to migration such as the Type 1 trout streams listed in section 3.10.4. Anadromous salmon and steelhead require most of the same habitat characteristics as brook trout, but can tolerate maximum daily water temperatures above 68 degrees F.

3.10.5 Proposed Action

3.10.5.1 Direct and Indirect Effects

Potential effects to aquatic resources include increased runoff and associated sedimentation due to reduced precipitation interception, increased stream water temperature due to reduced shading, and decreased coarse woody debris inputs within the 20 foot new ROW. The 40 foot ROW abandonment area opposite the new ROW would be allowed to revegetate with trees and shrubs. The vegetation growth within the ROW abandonment area would offset the effects of the new ROW over time.

There are no proposed in-stream activities associated with this project. Ten waterways would be crossed with temporary clear span bridges (TCSB). Table 3.10-1 lists the TCSB and any seasonal restrictions. There is potential for a small amount of sediment introduction into

streams at these TCSB crossings during installation. Temporary impacts to the stream banks themselves, if any, would be restored, thus avoiding any long-term sedimentation problems.

Table 3.10-1. List of ESE 6904-6905 Transmission Line Project TCSBs and Seasonal Restrictions.

Feature ID	Resource Name	PLSS Location	Number of TCSBs	Seasonal Restriction
495-S1	UNT	43N03W12	1 TCSB	none
497-S1	UNT	43N03W12	1 TCSB	none
499-S1	UNT	43N03W12	2 TCSB	none
587-S1	McCloud Creek	42N03W04	1 TCSB	none
608-S1	UNT to Platz Lake	40N30W27	1 TCSB	winter
657-S1	UNT	42N03W30	1 TCSB	none
A-706	HED Habitat Area	41N04W12	1 TCSB	winter
728.5-S1	UNT	41N04W13	2 TCSB	winter
745-S1	Foley Creek	41N04W24	1 TCSB	winter
752-S1	Rabbit Back Creek	41N04W24	1 TCSB	winter

UNT = Unnamed tributary

Use of the NRCS Curve Number Method (Wanielista et al. 1997, pp.153-155) indicates the ROW expansion would not result in increased runoff in the project corridor for either the 2- or 10-year storm events. Consequently, the ROW expansion would have little or no effect on runoff volumes in the project corridor.

To minimize the risk of erosion and related sedimentation potential to the aquatic resources within the project corridor, the Riparian and Water Body Protection design criteria would be implemented.

3.10.5.2 Cumulative Effects

Forest management activities within the analysis area would result in small increases in peak flows and an increase in the frequency and duration of high, near bankfull discharges (Troendle et al. 1998, Hornbeck et al 1997, Verry 1986). Implementation of the Proposed Action would result in a slight cumulative increase in these effects until abandoned portions of the ROW revegetated. Once the abandoned areas had revegetated there would be a slight reduction in the cumulative runoff.

Because forest management activities leave a riparian buffer, the projects considered for cumulative effects should not result in stream sedimentation or any reduction in shading or woody debris contributions. Therefore, there should be no cumulative effects with respect to these conditions from implementing the Proposed Action.

3.10.6 Alternative 1 - No Action

3.10.6.1 Direct and Indirect Effects

If upgrades to the existing transmission line do not occur across the HNF, ATC would continue to manage the existing project corridor under the existing special use permit and maintenance plan. Therefore, there would be no direct or indirect effects related to this project.

3.10.6.2 Cumulative Effects

Because there would be no direct or indirect effects, there, there would be no cumulative effects.

3.11 Recreation

3.11.1 Introduction

No comments were submitted during the scoping period expressing a concern with recreation. Therefore, this section provides a general summary of the anticipated environmental effects of the transmission line rebuild project on recreation within the HNF in terms of Forest Service standards and management of recreation.

The scope of this recreation resources analysis includes the Project area, nearby recreation areas, and recreational activities which may come into contact with the project area or associated construction activities.

3.11.2 Analysis Methods

The HNF Motor Vehicle Use (2010-2011), Management Areas (USDA 2006), and Recreation Opportunity Spectrum (2005) maps, GIS data, and EAs for recent projects on the East Unit were used for the analysis. The analysis considers the effects on identified use patterns and consistency with management of recreation resources as identified in the Forest Plan. Analysis specific to the Carp River campground considers the nature and timing of activities proposed in its vicinity on the experience of campground users in a Roaded-Natural recreation setting.

There are several acronyms that are used to describe 3 and 4 wheelers including ORVs (Off Road Vehicles), OHVs (Off-Highway Vehicles), ATVs (All Terrain Vehicles), UTVs (Utility Terrain Vehicles), and MATVs (Multiple Passenger ATVs). The HNF uses the term OHV to reference all of these on the HNF.

3.11.3 Analysis Areas

The spatial boundary for direct, indirect, and cumulative effects is the Project area (existing and proposed corridors) along with adjacent lands that are connected to the Project area by existing recreation opportunities (such as trails and campgrounds) since some of the roads used as access points to the project are also used for recreation. In addition, there will be noise impacts related to construction activities. The temporal period for analysis of direct, indirect and cumulative effects is the period of project implementation, estimated as 12-15 months from the beginning of construction because once construction is completed the associated impacts to recreation will cease.

3.11.4 Affected Environment

The project corridor crosses four MAs: 1.2, 4.5, 6.4, and 8.4.2 (Appendix D, Figure D-1). Portions of the project area in MAs 1.2, 4.5, and 8.4.2 have a Recreation Opportunity Spectrum (ROS) classification of Roaded Natural, while the portion of the project in MA 6.4 is classified as Semi-Primitive Motorized. MAs 1.2 and 4.5 are designated for dispersed recreational use; MA 6.4 is designated for semi-primitive motorized recreation and access to hunting and fishing areas. MA 8.4.2 is designated as a Wild and Scenic River corridor.

The project area includes a variety of landscapes, including upland and lowland forests, waterways, wetlands, residences, and open fields. Public land is mostly contiguous and

supports a variety of dispersed activities, although the project area crosses several private inholdings. The area has a well-established road and trail system, providing motorized access to most of the area and offering opportunities for recreation in primarily a roaded natural setting. Patterns of recreational activity in the area largely follow the roads; footpaths and unmaintained trails in the area generally start at the terminus of these roads. Off-road or off-trail travel around much of the project area is difficult due to undergrowth and prevalent wet areas.

Popular recreation activities within the project area include hunting, fishing, boating, hiking, camping, OHV riding, snowmobiling in the winter, driving for pleasure, and mushroom and berry picking. Most recreational activity in the area involves landowners of the private inholdings and local residents. However, there is also a substantial influx of visitors from outside the local communities during the fall hunting seasons. During white-tailed deer and black bear hunting seasons, both local residents and seasonal visitors often erect temporary hunting camps as bases for their activities. Generally, such camps are located in old decking areas and in other open spaces along the road system.

Recreational activities within the project area are described below in more detail:

3.11.4.1 Hunting

Game hunting is a dominant activity in the project area. Most hunting occurs during the fall seasons (September through December) and is relatively well-dispersed, although closely associated with the road system. White-tailed deer are by far the most-hunted game in the area, followed by ruffed grouse. According to the Forest Plan, the management prescription for the project area and surrounding lands includes maintaining the vegetative diversity and healthy stands of young aspen and hardwoods which provide deer habitat. The Michigan DNR indicates that deer populations in the Eastern UP are healthy and stable. For example, although the number of deer hunters decreased by 1.4% from the 2007 hunting season to the 2008 season, over this same time interval the number of deer harvested increased by 24.5% (Frawley 2009a).

Ruffed grouse populations are also reported to be stable in the UP, with most of Michigan's ruffed grouse harvest occurring in the UP. The number of ruffed grouse harvested increased by 25% from the 2006 hunting season to the 2007 season, while the number of ruffed grouse hunters increased by only 1% over this time interval (Frawley 2008).

Hunting for black bear, small game, and other game birds also occurs in the project area, but activity levels are generally low and dispersed (Frawley 2008 and 2009b). The project area contains bear forage, but because bears do not generally den in the flat and relatively moist landscapes that make up the area, bear hunting opportunities are limited.

3.11.4.2 Camping

Two campgrounds, the Foley Creek Campground and the Carp River Campground, are located adjacent to the project area. These campgrounds have 53 and 38 sites for visitors, respectively (USDA 2011). Visitors to these campgrounds often take advantage of the nearby fishing and hiking opportunities.

Foley Creek and Carp River are both popular trout-fishing rivers; the campgrounds provide access to these rivers. Fishing activity in the project area occurs primarily in the spring and fall, mostly from the banks of waterways. As with hunting, fishing activity is concentrated along the road system and access points such as campgrounds. Local residents are responsible for a large majority of the fishing activity in the project area, but residents have indicated fishing to be a very important form of recreation in response to other projects in the region. Local interest in protection and improvement of fishing opportunities is high.

The project area is not crossed by any major hiking trails. Hiking opportunities in the region are provided mostly by the North Country National Scenic Trail (NCT), approximately 8 miles west of the project area, and the Horseshoe Bay Trail, to the east of the project area.

3.11.4.3 Motorized Recreation

Eight roads identified on the Motor Vehicle Use Map (MVUM, 2010) as open to all wheeled motor vehicles cross the project area; five of these would be used as construction access points during project implementation. A substantial portion of OHV use is related to hunting and fishing by local residents, though an increasing portion is for recreational purposes by visitors. Illegal OHV use on closed gated roads also occurs on HNF.

Within the HNF, one groomed snowmobile trail runs along a portion of the ROW. This snowmobile trail is not open to OHV use. The project area is crossed by four additional snowmobile trails outside the HNF. These trails see high levels of use during the winter, by both residents and non-local visitors. As with OHV use, snowmobiles are driven both for utilitarian and recreational purposes. The use of both OHVs and snowmobiles is increasing overall on forest access roads and other trails in the UP.

The Carp River Campground is a stop on the St. Ignace Guided Auto Tour. This tour is self-guided and provides visitors the opportunity to learn about the history of the HNF, sight-see, and drive for pleasure (USDA HNF Website).

3.11.4.4 Non-motorized Recreation

Beyond fishing and hiking, discussed under Camping, above, non-motorized recreational activities within the project area include boating, horseback riding, berry and mushroom harvesting, nature viewing, winter sports, and use of the Horseshoe Bay Wilderness Area. Although these activities are non-motorized, they commonly involve the use of motorized vehicles for site access.

The Carp River Canoe Trail crosses through the project area. Boating access for this river and other waterways is provided by the Carp River campground, as well as roads and trails within the project area.

Berry and mushroom harvesting, as well as nature viewing (primarily bird watching) activities occur mainly in the spring, summer, and fall. Bird watching has become an increasingly popular activity throughout the UP, attracting tourists from many regions.

In addition to snowmobile use, winter recreation in the project area includes cross-country skiing and snowshoeing. While these activities are limited, (there are no groomed trails within the

project area) and likely restricted to local residents, the HNF is especially attractive to cross-country skiers in the spring months, due to its long winter seasons. Local residents may also continue other activities, such as walking and horseback riding, during the winter months, depending on accessibility of the area.

The Horseshoe Bay Wilderness Area is located across Mackinac Trail from the project area. This area generally attracts visitors seeking solitude and wildlife viewing opportunities in a remote, undisturbed, secluded area free of human influences. Use of the wilderness area is low, except during hunting season.

3.11.5 Proposed Action

3.11.5.1 Direct and Indirect Effects

Implementation of the Proposed Action may temporarily affect recreation resources within and connected to the project area. Project construction activities and associated traffic may displace some visitors and/or restrict access to certain recreation opportunities. However, any displacement or disruption of recreation activities would be temporary and would not be expected to have any lasting effects on recreation in the area.

Hunting

Hunters may be displaced from the project area during periods of construction, due to safety concerns for construction crews, as well as the likely wildlife-displacement effects of construction noise and traffic. Hunters may be less likely to establish roadside base camps along roads in the project area which are experiencing construction traffic. However, displaced hunters would be able to utilize hundreds of thousands of acres of alternative hunting land elsewhere on the HNF. Any restrictions on hunter access to the project area would be lifted upon construction completion and wildlife use of the area would likely return to normal levels.

Camping

Visitors to the Foley Creek Campground would likely only be affected by noise from project construction, as the campground is located on the opposite side of I-75 and Mackinac Trail. Many visitors may not notice the construction noise during periods of moderate vehicle travel on the highway. Construction noise and traffic, if noticeable, would likely be a minor increase to the traffic and noise levels regularly experienced at this campground, due to its proximity to the highway. Any impacts to the fishing and hiking opportunities associated with the Foley Creek Campground are also likely to be minor. Foley Creek fishing access would remain unrestricted; increases in noise levels experienced by people in this area would be in addition to the already-present traffic noise from the highway. The Horseshoe Bay hiking trail runs east from the campground. Due to its distance from the project area and the presence of the highway, it is unlikely that users of this trail would experience increased noise levels due to project construction.

Construction around the Carp River Campground would be restricted to after Labor Day and before Memorial Day. This restriction would avoid the period of highest recreation visitation. However the campground is still used after Labor Day by people coming to fish and people

seeking a somewhat less congested recreation experience. Visitors to the Carp River Campground would be more likely to experience increased levels of activity, traffic, and noise during construction. This disturbance may cause visitors to seek other campgrounds. Construction activities may temporarily hinder access to fishing opportunities on the Carp River, or cause people along the river to experience disrupting levels of noise and activity. During construction, it is likely that visitors seeking solitude, less crowded experiences, and/or quiet surroundings would be displaced from the Carp River Campground area.

All impacts to campground recreation activities are expected to be temporary, as campground recreation activities would resume normal levels upon completion of project construction.

Motorized Recreation

During implementation of the Proposed Action, traffic would increase on roads crossing the project area, particularly on the roads designated as construction access points. Eight of the roads crossing the project area are open to all motorized vehicles including OHV use according to the MVUM; five of these would be construction access points. OHV users may be displaced by reduced recreational experiences resulting from increased traffic on these roads. To prevent increased illegal OHV use within the project area, new access to the ROW corridor and new access onto the HNF from private lands via the ROW would be blocked with gates, boulders, or berms. The method of closure would be determined based on the on-ground conditions.

Snowmobile users may come into contact with limited construction activity which may occur on the project area during the winter season. A groomed snowmobile trail runs along part of the ROW within the HNF. Outside the HNF, four other snowmobile trails cross the project area.

Visitors following the St. Ignace Guided Auto Tour may experience increased traffic and/or disrupted nature and scenic views near the Carp River Campground stop. This may cause visitors wishing to drive for pleasure along the Auto Tour to have a reduced recreational experience during project construction.

All impacts to motorized recreation are expected to be temporary, as motorized recreation activities are expected to resume normal levels upon completion of project construction.

Non-motorized Recreation

During implementation of the Proposed Action, access to non-motorized recreation sites may be restricted by construction activities and/or traffic. Visitors wishing to participate in non-motorized forms of recreation may also be disturbed by increased noise and activity levels resulting from project construction. Some visitors may be displaced, seeking higher-quality recreation experiences at alternative locations throughout the HNF.

Boating access from roads and campsites within or adjacent to the project area may be temporarily hindered by increased traffic. Boaters on waterways that cross through the project area may have reduced recreational experiences in these areas due to increased noise levels and reduced scenic quality associated with project construction.

Sites for picking berries and mushrooms within the project area may be disturbed by construction activities; these areas would be allowed to re-vegetate following construction and berry and mushroom picking would continue.

Cross-country skiers, snowshoers, and other winter visitors may experience construction noise and traffic in the project area and vicinity; but as mentioned above, construction activities would be very limited and clearly signed during the winter season.

Visitors to the Horseshoe Bay Wilderness Area may experience increased noise levels during implementation of the Proposed Action. These visitors are often seeking solitude and wilderness experiences and therefore may be displaced by the increased noise levels, to eastern parts of the wilderness area or to other locations in the HNF. However, due to proximity of the wilderness area's western boundary to the highway, increased noise levels associated with project construction are not likely to greatly alter visitors' regular experiences in the wilderness area.

All impacts to non-motorized recreation are expected to be temporary, as non-motorized recreation activities are expected to resume normal levels upon completion of project construction.

3.11.5.2 Cumulative Effects

Under the Proposed Action, any impacts to recreation resources in or connected to the project area are expected to be localized and temporary, as described above.

The only project listed in Section 3.2 that could occur at the same time as the Proposed Action is the Shores project that has approximately 120 acres of timber harvest proposed within watersheds crossed by the transmission line. These harvest units are not in close proximity to the transmission corridor, but people seeking recreation opportunities may be displaced or otherwise come in contact with one or both projects should they be carried out simultaneously. All other projects listed in Section 3.2 will have been completed by the time that work on the Proposed Action began. Therefore, implementing the Proposed Action should have at most a minor cumulative effect on recreation activities and opportunities primarily for person seeking quieter and less congested experiences.

3.11.6 Alternative 1- No Action

3.11.6.1 Direct and Indirect Effects

Under the No Action Alternative, recreation resources in and connected to the project area would not experience any direct or indirect effects. Without construction activities, recreating visitors to the HNF would not be displaced or disrupted, and current recreation activity levels and patterns would persist. Routine transmission line maintenance activities, traffic, and noise would continue to be experienced by HNF visitors.

3.11.6.2 Cumulative Effects

Recreation resources are not expected to experience any direct or indirect effects under the No Build Alternative; consequently, there would be no cumulative effects to recreation activities and opportunities under the No Action alternative.

3.12 Heritage Resources

3.12.1 Introduction

Based on comments received from the public during scoping, heritage resources were not determined to be a significant issue. The Hiawatha Forest Plan FEIS has concluded that construction activities may present a “slight to moderate risk” to heritage resources within the HNF (USDA Forest Service 2006; pp 3-360).

The scope of this heritage resources analysis includes the transmission line ROW and proposed construction access points within the HNF; these areas may experience construction activities during project implementation.

3.12.2 Analysis Methods

In compliance with Section 106 of the National Historic Preservation Act of 1966, as amended, and in accordance with 36 CFR 800, public lands involved with actions proposed for this project have been inventoried for heritage resources through a Phase 1 archaeological survey, completed in 2010. This survey was conducted under an Archaeological Resource Protection permit and included both pre-field research and a field investigation. Pre-field research incorporated resources available at the Library of Michigan, the Office of the Michigan State Archaeologist, and the HNF Supervisor's Office. This research provided baseline information relating to known or postulated archaeological resources within the project area. The field investigation, conducted during the weeks of October 12 and 26, 2009, consisted of walkover reconnaissance and shovel test survey of the entire survey corridor, excluding inaccessible wetland areas. These wetland areas were inspected; however, to ensure that no well-drained areas were present within the wetlands. Detailed survey methods are presented in the archaeological survey report (Commonwealth Cultural Resources Group, Inc. 2010).

Pursuant to 36 CFR 800.2 (c-f), the report of the archaeological survey has been submitted to the HNF archaeologist for review, who will transmit the results of the survey to the Michigan State Historic Preservation Officer (SHPO) in his annual report. The above-ground survey report has been submitted to the SHPO directly.

3.12.3 Analysis Areas

The spatial boundary used to determine potential impacts to heritage resources consisted of a 60 m (200 ft) wide corridor centered on the existing transmission line ROW. This spatial boundary was defined in consultation with the US Forest Service and extends 15 m (50 ft) beyond either side of the proposed increase to the ROW. Effects for heritage resources were only determined for project areas within the HNF, totaling 215 acres (87 ha).

The temporal period for analysis of all effects is the period of project implementation, estimated as 12-15 months from the beginning of construction. Because the entire corridor has been surveyed for heritage sites and existing sites have been mapped, evaluated, and cataloged, future activities should present no additional risks to those resources.

3.12.4 Affected Environment

The project area is located in the Upper Peninsula of Michigan, along the shoreline of Lake Michigan. This area has experienced human activity from the late Paleoindian period through the present day and is an archaeologically-sensitive region. The area has been the focus of many archaeological investigations and there are numerous known archaeological sites located within about 1 mile (1.6 km) of the project area, particularly near St. Ignace (Commonwealth Cultural Resources Group, Inc., 2010).

The archaeological investigation discovered one, previously undocumented, archaeological site within the project area. This site primarily contains metal cans, glass containers, and other residential items such as bed springs, indicating 20th century occupation. The site is located approximately 20 m (66 ft) north of pole 742, along the edge of the existing ROW on the east side of the corridor. Phase 2 testing of the site determined that it is not eligible for listing in the National Register of Historic Places (NRHP).

In addition to FS 09-10-05-474, one archival archaeological site (FS 09-10-05-240) is on record as potentially present within the project area. However, this site has never been field verified and the archaeological field investigation failed to locate any evidence of this site. It is possible the site has already been destroyed or was misreported in the record and is located on private lands immediately outside the project area.

3.12.5 Proposed Action

3.12.5.1 Direct and Indirect Effects

Because the location of site FS 09-10-05-474 has been identified and the site can be avoided and isolated during construction, there would be no direct or indirect effects to it. Furthermore, because the entire ROW within the HNF has been surveyed for cultural sites it is unlikely that undocumented sites or the archival site occur within the area that would be disturbed. Therefore, no direct or indirect effects to cultural resources are likely if the Proposed Action is implemented.

3.12.5.2 Cumulative Effects

The implementation of avoidance measures would prevent the archaeological site from experiencing any direct or indirect effects under the Proposed Action and it is expected that these measures would result in long-term protection site during maintenance and completion of future HNF projects. Consequently, there would be no cumulative effects to heritage resources under the Proposed Action.

3.12.6 Alternative 1-No Action

3.12.6.1 Direct and Indirect Effects

The No Action Alternative would involve maintenance only. Because the entire ROW within the HNF has been surveyed for cultural sites and identified sites have been mapped, any maintenance activity carried out would apply the same avoidance measures specified for the Proposed Action. Therefore, No Action Alternative would have no direct or indirect effects to cultural resources.

3.12.6.2 Cumulative Effects

Because there are no direct and indirect effects from implementation of the No Action Alternative, there would also be no cumulative effects to heritage resources.

3.13 Transportation

3.13.1 Introduction

Based on comments received from the public during scoping, transportation was not identified as a significant issue. However, transportation is an important resource throughout the project area, providing access to residences as well as allowing for recreational and commercial use of the HNF. This section addresses consistency of transportation effects to Forest Plan guidelines.

3.13.2 Analysis Methods

The transportation system within the project area and surrounding vicinity was assessed using orthophotographs published by the National Agriculture Imagery Program (NAIP) in 2009 and GIS feature data supplied by the US Forest Service. Data on traffic volumes in the area were acquired from the Michigan Department of Transportation website.

Analysis in this section evaluated potential effects of proposed activities on transportation patterns and infrastructure conditions with respect to meeting Forest Plan guidelines in areas crossed by the transmission line.

3.13.3 Analysis Areas

The spatial boundary for the analysis of direct, indirect, and cumulative effects includes all roads and access points within the project corridor, as well as the major roads adjacent to the project corridor that would be used to access the Project. This is the area that would have increased traffic associated with the Project.

The temporal period for analysis of direct, indirect and cumulative effects is the period of project implementation, estimated as 12-15 months from the beginning of construction. This is because once construction is completed, the temporary access points would be closed and construction traffic related to the project would cease.

3.13.4 Affected Environment

Roads in the project area and surrounding vicinity are primarily rural, local county roads, switching to rural, local city roads near the St. Ignace Township. A few high-clearance, natural surface USFS roads also intersect the ROW. One highway is present in the area, Interstate 75 (I-75), a four-lane highway that runs north-south and intersects the middle of the project area. Other major roads in the area include Mackinac Trail, Charles Moran Road, M-123, Lemotte Street, and Bayshore Road. Construction access to the project corridor would be predominantly from by Mackinac Trail, which parallels the ROW on the east side for most of the transmission line. The St. Ignace Rest Area along southbound I-75 would also provide access to a section of the project corridor. ROW construction access would be provided by 11 county, 9 city, 1 private, and 5 USFS roads that intersect the ROW, as well as approximately 31 proposed access points. The proposed access points consist of existing trails, driveways, two-track roads, and utility line maintenance access paths (Appendix A). No new roads would be created for the proposed action.

3.13.5 Proposed Action

3.13.5.1 Direct and Indirect Effects

Under the Proposed Action, roads and trails within and adjacent to the project corridor could experience limited, short-term impacts due to construction activity and re-routing of traffic. These effects would include temporary closures and traffic delays, as well as some routing shifts and changes to travel surface. However, any increase in traffic flow or adjustment of traffic patterns would be temporary for all roads, limited to the time necessary to get equipment and materials moved.

At proposed transmission line crossings, some roads or lanes of some roads (I-75) may be partially or completely closed for safety purposes while the electrical conductor is being strung onto the support structures. These closures may range in duration from a few minutes to hours, depending on road width and the complexity of the crossing. Generally, closures of major routes are planned for the shortest period possible and at times (e.g. night) when traffic is typically light.

ATC has gained permission from the Michigan Department of Transportation to use the St. Ignace Rest Area for access into the project corridor to minimize impacts to HED habitat. Because design criteria specify winter construction in this area, the rest area would be closed at the time ATC is requesting use. In addition, ATC would implement appropriate traffic controls during crossings to ensure motorist and construction crew safety, as well as safe traffic flow. All permits necessary for road and highway crossings and use of the rest area would be obtained prior to construction.

Upon completion of construction, access points which require expansion for construction and/or which have not previously been used as ROW access points would be blocked with gates, boulders, or berms. The method of closure would be determined based on on-ground conditions at each location. Application of these closure devices would maintain existing travel patterns and help keep vehicle use in unauthorized areas to a minimum. Because no existing open roads or trails would be closed, blocking constructions access points would not have any effect on existing transportation routes.

ATC has been in communication with the Federal Aviation Administration (FAA) regarding the section of the line that runs just west of the St. Ignace airport. The Proposed Action includes pole heights and a configuration designed according to FAA regulations and the FAA has concurred that the project would have no effect on operation of the airport or airport safety.

Effects to use of the Carp River canoe trail would be temporary, restricted to a short-term closure while the new wires are strung. There will be no other work below the river banks so no other restrictions on river transportation would occur.

3.13.5.2 Cumulative Effects

Based on project EAs and scoping material and expected work periods, it does not appear that any of the projects listed in Section 3.2 would require use of roads within the rebuild project area during the period of line construction. Nor would they alter existing levels of access within the

rebuild project area. Therefore, the Proposed Action would not have any cumulative effects when combined with these projects.

3.13.6 Alternative 1- No Action

3.13.6.1 Direct and Indirect Effects

Under the No Action Alternative, transportation resources within and adjacent to the project area would not experience any direct or indirect effects from construction activities. Routine transmission line maintenance activities and traffic would continue to occur along project area routes as in the past.

3.13.6.2 Cumulative Effects

Transportation resources are not expected to experience any direct or indirect effects under the No Action Alternative; consequently, there would be no cumulative effects.

3.14 Visual Quality

3.16.1 Introduction

The Forest Service received two comments relating to visual quality during the scoping period expressing a concern that the proposed action would result in a degradation of visual quality. One comment specifically referred to disposition of the old wood poles, primarily on the respondent's property, but more generally along the ROW. The other comment was generally concerned about the degree to which the new poles and off-set would alter landscape scenic character.

3.16.2 Analysis Methods

Public comment about visual quality across the Forest is often described as keep the forest naturally-appearing (USDA 2006b, p 3-276). To address these general concerns, visual quality objectives (VQO) are used as a way of linking changes in the visual quality to landscape features and establishing guidelines for how much change from existing conditions is consistent with management of those areas.

The location of major viewpoints, landscape character, and the location of major viewshed elements were observed and documented during route walkovers and resource inventory work. The resulting baseline information was used in conjunction with the VQO system and research findings in order to complete a visual quality assessment of the proposed project.

3.14.3 Analysis Areas

The spatial boundary for analysis of direct, indirect and cumulative effects to visual quality is the existing ROW, the area affected by the proposed offset, and adjacent lands from which the project area can be seen from cross roads and adjacent roads as identified in Table 3.14-1. This area constitutes the entirety of area from which any changes to the visual character of the ROW could be observed. The temporal period for direct and indirect effects is three years, the approximate time it will take for disturbed areas within the existing ROW to recover. The temporal period for cumulative effects is ten years, the approximate time it will take for the trees and shrubs to become established and provide screening in the abandoned ROW.

3.14.4 Affected Environment

The project ROW crosses portions of the HNF classified as Retention and Partial Retention. These classifications are defined as follows:

Retention - This visual quality objective provides for management activities which are *not visually evident*. Under Retention, activities may only repeat form, line, color, and texture which are frequently in the characteristic landscape. Changes in their qualities of size, amount, intensity, direction, pattern, etc., should not be evident.

Partial Retention – Management activities remain visually sub-ordinate to the characteristic landscape when managed according to the partial retention visual quality objective. Activities may repeat form, line, color, or texture common to the characteristic landscape but changes in their qualities of size, amount, intensity, direction, pattern, etc., remain visually subordinate to

the characteristic landscape. Activities may also introduce form, line, color, or texture which are found infrequently or not at all in the characteristic landscape, but they should remain subordinate to the visual strength of the characteristic landscape.

Most of the National Forest lands crossed by the project have little topographic relief. As a result, view-sheds are at ground level from the perspective of visitors on foot and traveling on ORVs, snowmobiles, and cars and trucks along the road system. The corridor opening averages about 100 feet in width and crosses a variety of forest types (Table 2.2-1). The cleared area is covered with herbaceous and short woody vegetation with some shrubs and small trees at the margin. The transmission line wires are strung between weathered grey wood poles spaced approximately 325 feet apart.

Primary points of observation out of or into portions of the project ROW on the HNF are shown in Table 3.14-1 below.

Table 3.14-1. List of Viewpoints for the ATC ESE 6904-6905 ROW with VQO Classification and Dominant Landscape Characteristics.

Viewpoint Location	VQO Classification	Dominant Landscape Characteristics
I-75 near Foley Creek Campground	Partial Retention	Herbaceous and shrub wetland on organic soils
I-75 crossing north of Foley Creek Campground	Partial Retention	Highway / cedar and mixed conifers on clay plain
Mackinac Trail and I-75 at M-123 Interchange	Partial Retention	Cedar and wet pockets on organic soil and clay plain
Mackinac Trail between M-123 interchange and Gorman Road.	Partial Retention	Cedar and wet pockets on organic soil and clay plain
Red Creek Road / Riverline Road	Retention	Northern White Cedar / Aspen / Paper Birch on wet mineral soils
Red Creek Snowmobile Trail	Retention / Partial Retention	Openings, cedar, and aspen on sandy outwash and wet mineral soils
Weiss Road and Carp River Campground	Retention	Red pine and aspen/spruce/balsam fir on sandy outwash and transitional soils
Carp River Road	Retention	Aspen and paper birch on sandy outwash
Mackinac Trail from Carp River Road to Akrigg Road.	Partial Retention	Openings and cedar on wet mineral soils
Akrigg Road	Partial Retention	Aspen on wet mineral soils
Strom Road (N and S)	Partial Retention	Cedar/aspen/paper birch on wet mineral soils
Hesselink Road	Partial Retention	Aspen and cedar on wet mineral and transitional soils

3.14.5 Proposed Action

3.14.5.1 Direct and Indirect Effects

In general, the new poles would be spaced further apart and be slightly taller than the existing poles. The new poles would be brown rather than weathered gray, but would still be a color characteristic of most landscapes crossed and would fade some over time. In the foreground the diameter of the new poles would appear similar to the existing poles, but the brown color of the new poles would be more evident than the weathered gray poles. Although both the existing poles and new poles protrude above the treeline in the mid and background the new poles would be more evident due to their additional height and brown color. The existing weathered gray poles blend with the surrounding vegetation and tend to become indistinguishable.

Temporarily the corridor may appear somewhat wider to observers familiar with the area until abandoned portions of the existing ROW re-grow. Construction equipment would periodically be visible from various areas during construction and evidence of construction activities may be visible for 2-3 years afterwards. In spite of the temporary equipment use, temporary increase in cleared area, and pole differences, once constructed and the visible effects of construction disappear, the rebuilt lines would follow the color, line, form, and texture of the existing corridor. Subsequently, the new ROW would continue to be maintained in a manner similar to its present condition under the new O&M Plan. Therefore, existing visual quality would be retained across the ROW within the HNF.

A rendering showing existing poles and the same location with the proposed, slightly taller brown steel poles, and additional clearing is shown in Figure 3.14-1 followed by a description of changes specific to identified viewpoints.



Figure 3.14-3. Rendering facing north showing existing poles (left) and an approximate configuration of the proposed steel poles (right). The first existing pole is structure #757, located about 1800 feet north of the terminus of Partyline Road.

I-75 near Foley Creek Campground – In this location, one existing pole on the HNF is briefly visible when heading north and two existing poles on the HNF are briefly visible when heading

south. If the proposed action were implemented, no poles would be visible when heading north and one pole would be visible when heading south. Given the rate of travel, travelers heading south would not notice any difference in the landscape. Travelers headed north may have a somewhat greater sense of a natural landscape with the absence of any visible poles.

I-75 crossing north of Foley Creek Campground – In this location, one existing pole on the HNF is visible when heading north and one existing pole on the HNF is visible when heading south. If the proposed action were implemented, these poles would be replaced in approximately the same locations. Given the rate of travel, travelers heading either direction would not notice any difference in the landscape.

Mackinac Trail and I-75 at M-123 Interchange – In this location, two existing poles on the HNF are briefly visible across private land when heading east and west along M-123 between I-75 and when traveling along the northbound entrance ramp to I-75. These two visible poles would be replaced by one new pole. Given the distance and minimal changes, most observers traveling along the road would not notice the difference.

Mackinac Trail between M-123 interchange and Gorman Road – Views of the project corridor in this area occur through small openings in the treeline between Mackinac Trail and the ROW – two poles when headed north and one when headed south. In each instance, the existing poles would be replaced in roughly the same location. Given the speed of travel, small visible area, and minimal difference in pole characteristics within the ROW, most observers would not notice any change following the rebuild.

Red Creek Road / Riverline Road – In this location, there are four existing poles visible south from the Red Creek Road crossing and four existing poles visible along Riverline Road running north toward the Carp River. In both cases, the four poles would be replaced by three. To the south, most observers would not notice the alteration from existing conditions given the long sight line and minimal change in pole height and color as compared to the adjacent conifer stands. To the north, the shift from wood to steel poles would be more evident due to the pole locations along the road edge. However, the surrounding forest is presently mature cedar/aspen/paper birch that would tend to obscure the change in pole height and color. Therefore, while some observers may notice the new poles, overall the existing visual character of the landscape in this area would be retained.

Red Creek Snowmobile Trail – Because the trail runs along the transmission line corridor, numerous poles are readily visible to snowmobile riders. The new poles would be spaced further apart than the existing poles and would appear darker in relation to the winter colors than the existing wood poles. However, the new pole height and brown steel color is consistent with the predominant cedar and aspen/conifer forest that surrounds the ROW. Therefore, while snowmobilers may notice the changed pole appearance and configuration, the rebuilt line would follow existing landscape line, form, texture, and color and thus retain the existing landscape character.

Weiss Road and Carp River Campground – Two poles are presently visible from the eastern campground loop and facing south from Weiss Road. Three poles are presently visible facing north from Weiss Road. After the rebuild, one pole would be visible from the campground, one

would be visible facing south from Weiss Road and two would be visible facing north. The ROW would be expanded 30 feet to the east. In this area, the ROW has mature red pine along the east side and pole-sized aspen, spruce and balsam fir to the west. Views of the ROW are generally toward the pine stand where the new pole form, color, and height would tend to blend in. Because of the blending and view perpendicular to the ROW from the campground, viewers from that location are unlikely to notice any change. People familiar with the area traveling along Weiss Road may notice a somewhat wider corridor temporarily due to the view up and down the ROW. However, the lesser number and spacing of the new poles should result in a somewhat less intrusive visual presence and their form and color reflects existing landscape conditions. Therefore, existing visual quality should be retained.

Carp River Road –Presently, two poles are visible when looking north and south along the ROW from Carp River Road. There is one small stand of red pine along the south side of the road; the remainder of the corridor is surrounded by immature aspen. Following the line rebuild, the corridor would be slightly wider to the west and one pole would be visible in either direction. As with the Weiss Road crossing to the south, people familiar with the area traveling along the road may notice a somewhat wider corridor temporarily. However, the lesser number and spacing of the new poles should result in a somewhat less intrusive visual presence and the pole form and color reflects existing landscape conditions. Therefore, existing visual quality should be retained.

Mackinac Trail from Carp River Road to Akrigg Road – Views of the ROW in this area occur across open wetlands toward cedar and mixed aspen forest. The corridor would not be widened because it is already open. Seven existing poles would be replaced with five new structures. Because most viewers would be traveling at local road speed, no clearing would occur, and the new poles would reflect the background forest character, visual quality in this area would be retained. Most viewers would not notice any change other than perhaps less intrusion of poles.

Akrigg Road – At this road crossing, three existing structures are visible to the south and five existing structures are visible to the north. The surrounding forest to the south is mature aspen and mixed aspen. To the north there is young aspen to the west side and mature mixed aspen forest to the east. Following the line rebuild the corridor would be slightly wider to the west and one pole would be visible to the south and three to the north. People familiar with the area traveling along the road may notice a somewhat wider corridor temporarily and the poles to the north may also appear somewhat taller given the young aspen background. However, the lesser number and spacing of the new poles should balance the effect somewhat and the change would become less apparent as the aspen stand matures. Therefore, existing visual quality in this area should be partially to fully retained.

Strom Road (N and S) – At these road crossings four existing structures are visible up and down the ROW from each location. The corridor to the north is surrounded by pole-sized cedar. The corridor to the south is bounded by pole-sized cedar to the east and mature mixed cedar forest to the west. Following the rebuild two to three new structures would be visible in each direction from the roads. People familiar with the area traveling along each spur of Strom Road may notice a somewhat wider corridor temporarily due to the view up and down the ROW and

the poles may appear somewhat taller. However, the lesser number and spacing of the new poles should result in a somewhat less intrusive visual presence and their form and color reflects the existing cedar-dominated landscape. Therefore, existing visual quality should be retained.

Hesselink Road – In this area, the ROW is visible viewing perpendicular from Mackinac Trail across a temporary opening created as part of the Rudyard Project and up and down the ROW from Hesselink Road. Five structures are presently visible from Mackinac Trail, three facing south from Hesselink Road, and five facing north. Most of the surrounding forest is regenerating aspen with one stand of mixed cedar north of Hesselink and east of the ROW. The existing poles are somewhat taller than the aspen but are consistent with the species' lighter color bark. The existing poles show a contrast when viewed with the cedar stand in the background.

Following the rebuild, three structures would be visible from Mackinac Trail with a young aspen stand in the background. Looking south from Hesselink Road, two structures would be visible with regenerating aspen on both sides of the ROW. Facing north, three structures would be visible with regenerating aspen to the west and mature mixed cedar forest to the east.

Because clearing would be carried out along the edge of the regenerating aspen stands which are generally short, most observers would not notice any difference in the ROW width following the rebuild. However, the brown structures would be somewhat more apparent against the lighter aspen background. They should blend in when viewed facing the cedar forest. People familiar with the area may notice that the new poles are slightly taller; however, the lesser number and spacing of the new poles should result in a somewhat less intrusive visual presence. Overall, while some changes in the visual landscape may be apparent, for the most part the proposed changes follow existing line, texture, and form in the landscape so the present visual character should be largely retained.

3.14.5.2 Cumulative Effects

The only activities associated with projects listed in Section 3.2 that are within viewsheds including the ATC ROW are several stands approved for harvest in the Rudyard Project. These stands have already been cut and the changed conditions have been considered in the analysis of direct and indirect effects included above. Because no other activities are proposed that would occur within or immediately adjacent to the ROW and result in visual changes, no cumulative effects are likely from the rebuild as proposed.

3.14.6 Alternative 1 – No Action

3.14.6.1 Direct and Indirect Effects

If the proposed rebuild were not approved, ATC would continue to maintain the ROW in an open condition and perform maintenance and replacement work as needed to keep the line functioning. This would include periodic pole, cross-arm, and equipment replacement; mowing, use of existing access points, and so forth. In general, the effect of these actions would be to keep the corridor in its present state.

3.14.6.2 Cumulative Effects

Because there would be no changes to the transmission line or maintenance practices, no cumulative effects would result.

3.15 Socio-Economic Environment and Environmental Justice

3.15.1 Introduction

This section assesses the social and economic impacts of the Proposed Action and the No Action Alternative, including the potential impacts on the regional economy, changes in the value of the forest to visitors and to adjacent landowners, and potential impacts to minority and low-income communities.

3.15.2 Analysis Methods

3.15.2.1 Socio-Economics

Evaluation of potential socio-economic effects of the alternatives to the social structure and economics were carried out based on anticipated short-term and long-term changes in employment, wages, local infrastructure, demographics, community services, tax receipts, property valuations, utility rates and improved utility service (i.e., how many additional customers can be served and improved reliability of service).

3.15.2.2 Environmental Justice

Executive Order (EO) 12989 requires that each federal agency make achieving environmental justice part of its mission by “identifying and addressing disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.”

Directives for implementing EO 12898 within the context of the NEPA process are provided by the Council on Environmental Quality (CEQ) in *Environmental Justice Guidance under the National Environmental Policy Act*. The US Department of Agriculture (USDA) Office of Civil Rights subsequently developed a Civil Rights Impact Analysis departmental regulation in order to provide USDA agencies, Departmental Administration, and Departmental Offices with guidance on how to meet civil rights impact analysis requirements (USDA 2003).

CEQ and USDA guidelines define a minority person as an individual of Black (not of Hispanic origin), Hispanic, Asian, Native American and “Other” origins. CEQ guidelines state that minority population should be identified where either:

- a. The minority population of the affected area exceeds fifty percent, or
- b. The minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis.

CEQ and USDA guidelines similarly define low-income persons using the Bureau of the Census approach that identifies low-income populations with the statistical poverty thresholds. Adverse impacts to minority and/or low-income persons are considered high and disproportionate if the project impact affects a minority and/or low-income population is more severe or greater in magnitude than the impact that would be imposed upon the non-minority and/or non-low-income

population. The Forest Service considers the possibility of Environmental Justice issues in situations where a project occurs within or may affect populations having twice the statewide minority and low-income percentages or greater.

Information on race, ethnicity, and income was analyzed down to the Census Block level utilizing the 2000 U.S. Census Population and Housing data. Census Block level data are the most detailed level of population data made available by the US Bureau of Census.

3.15.3 Analysis Area

The analysis area considered for direct, indirect, and cumulative effects is that portion of Mackinac and Chippewa counties supported by the existing ESE 6904-6905 transmission line along with the additional area that would be served by an upgraded line. This is the geographic area within which electric service, and thus economic activity and domestic electric use, could be affected by the condition of ATC's ESE 6904-6905 lines. The temporal period for the analysis is 12 to 15 months, which corresponds to the project's expected time of construction. This is the timeframe when the project would provide a flow of tangible and intangible benefits to the local communities.

3.15.4 Affected Environment

3.15.4.1 Economic Character/Energy Use and Electric Transmission Conditions

General Economic Character and Energy Use

The project area economy is dominated by the tourist and natural resource industries with somewhat lesser employment in government agencies. Service industries (including hotels, restaurants, administration and all other services), retail trade, and healthcare account for roughly 72 percent of jobs in the Chippewa and Mackinac counties compared to approximately 58 percent for the state as a whole (Table 3.15-1).

Table 3.15-1. Percent employment in Mackinac County, Chippewa County, and Michigan by category for 2000 as reported by the 2000 Census Bureau.

Employment Category	Mackinac	Chippewa	Michigan
Agriculture, forestry, fishing and hunting, and mining	3.4	1.9	1.1
Construction	12.3	6.7	6
Manufacturing	4.2	5.1	22.5
Wholesale trade	2	1.9	3.3
Retail trade	11.4	11.7	11.9
Transportation and warehousing, and utilities	6	4.1	4.1
Information	0.9	2	2.1
Finance, insurance, real estate, and rental and leasing	4.1	3.6	5.3
Professional, scientific, management, administrative, and waste management services	3.4	4.7	8
Educational, health and social services	18.9	23.9	19.9
Arts, entertainment, recreation, accommodation and food services	17	16.9	7.6
Other services (except public administration)	5.5	4.1	4.6
Public Administration	10.9	15.4	3.6
Total	100	100	100

Energy use data for just the EUP are not readily available. However, studies by the U.S. Energy Information Administration and Michigan Public Service Commission suggest that the Upper Peninsula generally mirrors the Lower Peninsula with respect to energy use and expenditures with somewhat more reliance on wood, LP gas, and fuel oil for residential heating.² For commercial customers, expenditures for electricity exceed those for all other forms of energy combined (about 62%). For residential customers, electricity expenditures trail natural gas expenditures slightly, and the two energy sources together account for approximately 85 percent of all expenditures. (Figures 3.15-1 and 3.15-2).

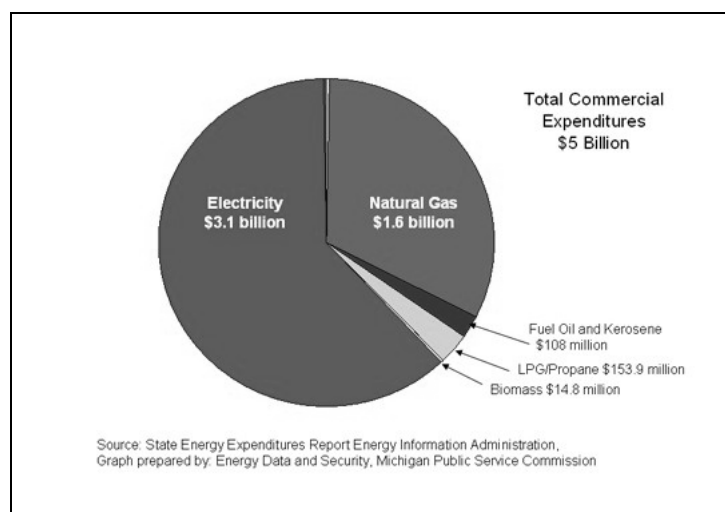


Figure 3.15-1. Michigan commercial energy expenditures, 2005 calendar year

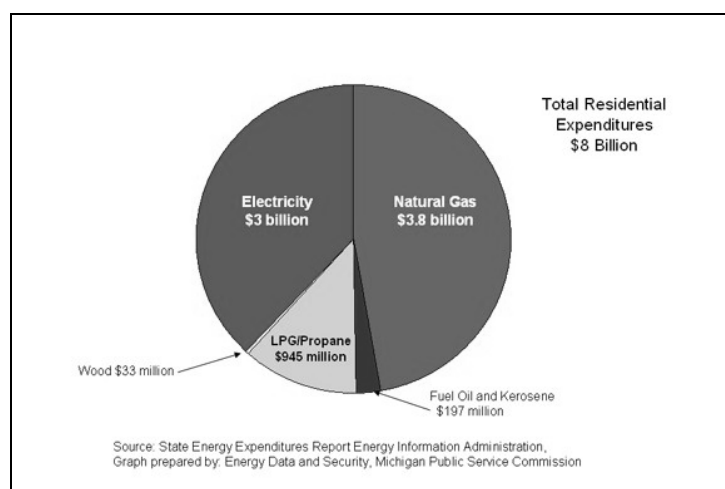


Figure 3.15-2. Michigan residential energy expenditures, 2005 calendar year

² http://www.eia.doe.gov/cneaf/electricity/st_profiles/michigan.html

Of the various energy supplies, electricity is the most central since, in many cases, it is necessary for the use of other energy sources (e.g. furnace blowers) and it supports infrastructure essential for the commercial, service, and administrative activities (e.g. lighting, computer, refrigeration, and other equipment operation) that form the core of the EUP economy.

3.15.4.2 Income and Ethnicity

Table 3.15-2 provides a summary of income for Mackinac County, Chippewa County, and the State of Michigan. Median household income in the counties is lower than the state average, and unemployment is somewhat higher on average, to some extent reflecting the seasonal nature of the tourist and natural resource industries.

Table 3.15-2. Family income in Mackinac County, Chippewa County, and Michigan as reported in the year 2000 Census

Income Category	Mackinac	Chippewa	Michigan
Total Families	3406	9037	2,591,312
Less than \$10,000	4.9	6.2	4.8
\$10,000 to \$14,999	5.0	5.3	3.5
\$15,000 to \$24,999	14.8	15.7	9.6
\$25,000 to \$34,999	18.3	15.4	11.3
\$35,000 to \$49,999	21.6	22.1	16.8
\$50,000 to \$74,999	21.9	23.8	23.5
\$75,000 to \$99,999	7.8	8.7	14.2
\$100,000 to \$149,999	3.8	3.9	11.1
\$150,000 to \$199,999	0.9	0.7	2.7
\$200,000 or more	1.0	0.3	2.5
Median family income (dollars)	39,929	41,450	53,457
Percent below poverty level	7.2	8.9	7.4

Table 3.15-3 provides a summary of ethnicity for Mackinac County, Chippewa County, and the State of Michigan. Both Mackinac and Chippewa Counties have ethnicity profiles generally consistent with the statewide averages except that the area has substantially fewer individuals classified as Black or African American and substantially more individuals in the American Indian and Alaska Native category.

Table 3.15-3 Ethnicity Percents of Mackinac County, Chippewa County, and Michigan residents as reported in the year 2000 Census

Race	Mackinac	Chippewa	Michigan
Total population	11,943	38,543	9,938,444
One race	95.1	95.6	98.1
White	80.1	75.9	80.2
Black or African American	0.2	5.5	14.2
American Indian and Alaska Native	14.2	15.3	0.6
Asian	0.3	0.5	1.8
Native Hawaiian and Other Pacific Islander	0.0	0.0	0.0
Some other race	0.3	0.4	1.3
Two or more races	4.9	4.4	1.9

3.15.5 Proposed Action

3.15.5.1 Direct and Indirect Effects

General Economic Effects

Upgrading the lines as proposed would eliminate present operational constraints and service risks and allow the lines to support increased population and economic activity under all future scenarios evaluated by the Collaborative (ATC 2009a). Growth support would be in terms of both meeting increased demand and distributing new sources of local generation.

It is anticipated that the construction of the proposed action would require approximately 20 full time workers including lineman, equipment operators, supervisors, monitors and management. These jobs all require specialized training and/or experience, therefore 10-20% are anticipated to be local workers and the remainder are anticipated to come from outside of the area of analysis. It is estimated that workers from outside of the area would spend approximately \$100 per day locally for living expenses (motel or rent, food, gas, etc.) In addition, MJ Electric, the contractor that would build the proposed action, estimates the company would spend approximately \$10,000 per week for approximately 18 months locally during the duration of the project (MJ Electric 2011).

Environmental Justice Evaluation

Although median family incomes in Mackinac and Chippewa Counties are somewhat less than the statewide median income, the percentage of families in each county falling below the poverty level is much less than twice the statewide average. Therefore, implementation of the Proposed Action would not result in disproportionate positive or adverse impacts to a low income population or any related environmental justice concerns.

Because the number of individuals in the American Indian and Alaska Native category is more than 20 times the statewide average the possibility of disproportionate positive or adverse impacts was considered by way of further evaluating whether environmental justice concerns were warranted. The evaluation considered both the immediate economic impact of construction and the long-term impact of upgraded electric transmission service.

Local expenditures from construction would generally be in terms of materials, goods, and services and tend to support employment in these areas. The affected economic categories encompass a majority of jobs in the EUP and these jobs appear to be filled in relative proportion to ethnicity. Therefore economic activity generated by construction would be positive and would not likely result in disproportionate impact to any ethnic group.

The long-term effect of the transmission line upgrade would be more stable service with less risk of interruption and capacity to support population and economic growth. Because these electric grid improvements would be regional in nature and serve residents and businesses in the EUP regardless of ethnicity or ownership, it does not appear that the project would affect any group in the EUP disproportionately.

3.15.5.2 Cumulative Effects

There are no past, present, or reasonably foreseeable projects related to electricity transmission other than minimal maintenance of the line equipment. If the ESE 6904-6905 line were upgraded it is reasonably foreseeable that most, if not all of the connected projects identified by the Collaborative for the EUP would also eventually be implemented.

If the proposed project were constructed it would be fully upgraded to meet or exceed future electrical transmission needs in all scenarios evaluated by the Collaborative. Therefore there is no reason to expect additional upgrade work on the corridor within the National Forest and it is probable that there would be less need for maintenance activity to keep the line in service. Outside the National Forest, upgrading the line would allow cumulative development of the local economy through more commercial, industrial, and service/retail establishments that, in turn, would support a larger local employment base. The related foreseeable activities identified by the Collaborative would support this general trend across a larger geographic area.

Because the upgraded transmission would support all of the service area and all service area populations in similar fashion, the cumulative effects of the upgrade and related actions do not appear to present any environmental justice concerns.

3.15.6 Alternative 1 – No Action

3.15.6.1 Direct and Indirect Effects

If the ESE 6904-6905 line is not upgraded, ATC would continue to maintain the line in its present condition. As a result, existing maintenance difficulties, operational constraints, and service risks would persist. The line would not be able to handle increased demand from residential or commercial/industrial use, nor would it be able to distribute electricity from new sources of local generation. Economic growth would be curtailed and residential customers would eventually be subjected to planned or unplanned maintenance outages in order to keep the line in service.

Because the limitations of and risks to electric distribution would be spread across the service area, there is no reason to believe that they would fall disproportionately on any subset of the local population. Therefore, there should be no environmental justice concerns from not upgrading the lines.

3.15.6.2 Cumulative Effects

There are no past projects related to the Proposed Action. Because most of the projects identified by the Collaborative for the EUP are connected to upgrading the ESE 6904-6905 lines, it is reasonably foreseeable that they too would not be implemented.

If the proposed project were not constructed, it would meet future electrical transmission needs for only the slow, restricted growth scenario and would require continual maintenance work to keep in service. Therefore, it is likely that there would be an increasing need to work on the line equipment within the National Forest.

Indirectly, not upgrading the line would restrict development of the local economy through more commercial, industrial, and service/retail establishments that, in turn, would support a larger

local employment base. The related foreseeable activities identified by the Collaborative would not be implemented, restricting growth across a larger geographic area.

Because the constricted transmission would restrict development throughout the service area and affect all groups in similar fashion, the cumulative effects of the upgrade and related actions do not appear to present any environmental justice concerns.

3.16 Wild and Scenic Rivers

3.16.1 Introduction

Due to the differing levels of existing development (such as access, wilderness, road density, facilities, bridges, etc.) the river, as described in the Michigan Scenic River Act, was divided into several segments, all administered by the USDA Forest Service. The powerline corridor travels through segment F of the Carp Wild and Scenic River corridor between FR3308 and FR 3118. It only crosses the Carp Wild and Scenic River once, approximately ¼ mile north of FR3118. Segment F is designated a recreation classification.

Management activities are not allowed to impede the free-flowing nature of the river, diminish the potential classification, or diminish the outstandingly remarkable values.

3.16.2 Analysis Methods

No comments relative to the Carp River Wild and Scenic River were submitted during the scoping period. Therefore, the analysis of potential project effects is focused on consistency with protection of the river's Outstandingly Remarkable Values (ORVs), river classification, and free-flowing nature. Analysis methods are those described in the pertinent resource sections of this document.

3.16.3 Analysis Areas

The spatial boundary for direct and indirect effects is WSR segment F and the associated corridor because river related effects occur in the same location as the project, or downstream from the project. The temporal boundary for the direct and indirect effects is the period of project implementation, estimated as 12-15 months from the beginning of construction because the project would be completed during that time.

The spatial boundary for cumulative effects is the entire WSR and the associated corridor because effects to the outstandingly remarkable value have an influence on the entire Wild and Scenic River. The temporal boundary for cumulative effects ten years – the approximate time it will take for abandoned portions of the ROW to regenerate to sapling size.

3.16.4 Affected Environment

The Michigan Scenic Rivers Act of 1991 (P.L. 102-249) was passed by Congress in March 1992, designating certain segments of five rivers (Indian, Whitefish, Sturgeon, Carp and East Branch Tahquamenon) on the HNF as National Wild and Scenic Rivers. ATC's ESE 6904-6905 lines cross the Carp River on private land just north of the terminus of Riverline Road (FR 3118) and approximately two miles downstream from the Carp River campground. The segment where the crossing occurs is classified as Recreational and the Carp River Establishment Report identified the following ORVs as the basis for designation:

- Ecological/Botanical
- Recreation
- Wildlife
- Fisheries

- Geology
- Heritage
- Hydrology

Human intrusions are clustered throughout segment F. From the vicinity of Carp River Campground to the mouth, there are several major intrusion: the erosion banks upstream from FR 3445, the bridge on FR 3445, the campground complex and modifications, the private land and buildings, the bridge across Mackinac Trail, the I-75 bridges, and accessible fishing pier on a seawall, a boat access and large parking lot.

The Great Lakes Marsh community type is ranked by The Nature Conservancy as globally threatened (G3). Located in Segment F near the mouth of the Carp River, particularly along the north shore, this community type is strongly influenced by Lake Huron. The Great Lakes Marsh community type begins at the mouth of the Carp River and extends approximately 2 miles to the north. Beyond the river corridor, the Forest Service has established the Horseshoe Bay Research Natural Area to protect this community type and provide opportunities for scientific research.

Throughout most of its length Carp River offers a setting where canoeists have the opportunity to experience a sense of remoteness, solitude and freedom where the sights and sounds of nature dominate. The level of development and number of users in the river corridor increases in segment F. Canoeists may encounter a number of anglers at the fishing pier at the river's mouth, especially during the spring and fall anadromous fish runs. Within segment F, there are also several popular user developed dispersed campsites, as well as the Carp River Campground.

The diversity of wildlife habitat and the secluded nature of the corridor provides habitat for nearly all species of reptiles and amphibians, plus the vast majority of birds and mammals. This includes habitat for federal and state listed threatened, endangered and sensitive species. Due to its location on the landscape, the Carp River corridor plays an important role for wildlife as a travel corridor with limited human disturbance which is unique compared to other rivers within the region.

Fishing for anadromous species such as steelhead and various species of salmon, as well as springtime smelt dipping attracts visitors from outside of the region to areas such as Carp River Campground, near Mackinac Trail and I-75, and the fishing pier at the mouth of the river. Depending on the time of year, fish caught near the mouth of the river include lake herring, steelhead, salmon, brook, brown and rainbow trout.

The Carp River flows along the strike of the bedrock formation from Rock Rapids to approximately Carp River campground which is most of its designated length. This is unique in a region in which most rivers generally flow the gentle dip of the bedrock. The Carp River receives groundwater flow through karst features associated with the Niagara escarpment, which is a rare ecological feature.

Prehistoric Native American sites, especially in segment F, were found to be among the largest and most data rich sites in the Eastern Upper Peninsula. These sites include stone tools,

pottery, and animal bone. Different time periods are represented by a variety of pottery styles. The earliest of these is about 2,000 years old. Test excavation at some of these sites has established their potential National Register of Historic Places eligibility. There is also a site that relates to prehistoric use of the extensive clay deposits along the banks of the lower Carp River that includes a basin or pit lined with fired clay and is unlike anything previously discovered in northern Michigan.

Presently, there are four poles north and south of the river crossing within the WSR corridor. The nearest existing pole north of the river is approximately 30 feet from the river bank and the nearest existing pole south of the river is approximately 155 feet from the river bank. The cleared width of the ROW is approximately 85 feet with mature mixed cedar forest to either side.

3.16.5 Proposed Action

3.16.5.1 Direct and Indirect Effects

Implementation of the proposed action would result in placement of two structures within the WSR corridor north of the river and three within the corridor to the south. The nearest pole to the north would be placed approximately 340 feet from the river bank and the nearest pole to the south would be about 175 feet away. Access for construction would be from Riverline Road on the south side and from private land on the north side. Approximately 20 feet of additional clearing would occur on the west side of the existing opening and approximately 40 feet on the east side would regenerate naturally. Pulling ropes for the new wires would be ferried across the river in a canoe or small rowboat.

Construction within the WSR corridor would result in some minimal vegetative and soil disturbance from equipment travel, although most travel within the HNF would be along an established road. Launching, using, and removing the canoe or boat may result in some minor bank disturbance similar to recreation use. The reduction in poles and reconfiguration of locations should make them less noticeable and the brown color should blend in with the surrounding mature mixed forest. Boaters and people wading the river may temporarily notice a slightly enlarged corridor but after 2-3 years, the effects of construction should be obscured by new growth and not be apparent. No work would occur within the river itself, so no direct or indirect effects to river flows, water quality, or aquatic resources are expected. There are no T&E species or heritage sites along the ROW within the WSR river corridor, so there would be no impacts to these resources. Travel along the Carp River may be halted for a very short period while the new wires are strung. There would be no other work below the river banks so no other restrictions on river travel would occur.

Overall, implementing the proposed action would result in very minor, short-term, direct impacts to vegetation and soils within the WSR corridor and short-term minor impacts to recreation experience from noise, visible equipment use, clearing, and wire stringing. All the resource impacts identified within the WSR corridor are minor and short-term and the character of the transmission line crossing would be essentially unchanged once the rebuild is completed. Therefore, implementation of the Proposed Action would not affect any of the river's ORVs and appears consistent with management of the crossed river segment as recreational.

3.16.5.2 Cumulative Effects

Analysis of resources related to the Carp River's ORVs did not identify any cumulative effects from any of the projects listed in Section 3.2 and future maintenance of the proposed rebuild would maintain the ROW in essentially its present character other than the new structures (which would be further from the river bank). Therefore, there would be no cumulative effects to the Carp River's ORVs from implementing the Proposed Action.

3.16.6 Alternative 1

3.16.6.1 Direct and Indirect Effects

If the proposed rebuild were not approved, ATC would continue to maintain the ROW in an open condition and perform maintenance and replacement work as needed to keep the line functioning. This would include periodic pole, cross-arm, and equipment replacement; mowing, use of existing access points, and so forth. In general, the effect of these actions would be to keep the corridor in its present state and existing ORV values would be maintained.

3.16.6.2 Cumulative Effects

Because Alternative 1 would not result in any changes to the transmission line or maintenance practices, no cumulative effects would result from selecting it.

CHAPTER 4 – CONSULTATION AND COORDINATION

The Forest Service consulted the following agencies, tribes, and individuals.

4.1 Agencies Consulted _____

4.1.1 Federal, State, and Local

- U.S. Fish & Wildlife Service
- Michigan Department of Natural Resources
- Michigan Department of Environmental Quality
- Michigan Department of Transportation
- Michigan Natural Features Inventory

4.1.2 Tribes

- Lac Vieux Desert Band of the Lake Superior Chippewa Indians

4.2 Persons Consulted _____

- Hiawatha National Forest
 - Lyn Hyslop
 - Anne Davey

4.3 List of Preparers _____

- Stantec Consulting Services Inc. (formerly Natural Resources Consulting, Inc.)
 - Robert Doherty
 - Joe Pagliara
 - Stacy Foster
 - David Giblin
 - Melissa Curran
 - Tom Nedland
 - Nikola Bertagnoli

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