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Environmental Assessment

Exhaust Fire KW Project

Huron Shores Ranger Station
Huron-Manistee National Forests

Iosco County, Michigan

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Document Structure

National Forest management is guided by congressional mandate to provide multiple benefits to American people for present and future generations. The National Environmental Policy Act of 1969 (NEPA) and the Council on Environmental Policy (CEQ) implementing regulations (40 CFR 1500-1508) establish policy, set goals and provide regulations for analyzing and documenting the environmental consequences of proposed management actions. This analysis follows the process outlined in the CEQ implementing 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:

- *Introduction:* 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.

- *Comparison of Alternatives, Including the Proposed Action:* This section provides a more detailed description of the agency's proposed action and design criteria for the project, as well as alternative methods for achieving the stated purpose.

- *Environmental Consequences:* This section describes the environmental effects of implementing the proposed action and other alternatives. This analysis is organized by resource. Within each section, the affected environment is described, followed by the effects of the No Action Alternative that provides a baseline for evaluation and comparison of the other alternatives that follow.

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

Additional documentation, including more detailed analyses of project-area resources, may be found in the project planning record located at the Huron Shores Ranger Station in Oscoda, Michigan.

Chapter 1: Introduction

1.1 Introduction

On April 24, 2010, at approximately 7:30 p.m., a wildfire started in the Pine River Kirtland's Warbler Management Area (KWMA), an area of designated essential habitat, managed for the conservation and recovery of Kirtland's warbler. The Pine River Kirtland's warbler Management Area (Pine River KWMA), is approximately 20, 542 acres in size of which 5,752 acres are currently occupiable by Kirtland's warblers. The wildfire was contained at approximately 4:30 a.m. the following morning however before it was contaned, it burned through approximately 260 acres or 80% of the Kobs KW block. The Kobs KW block consisted of 336 acres of suitable jack pine in the Pine River KWMA. The jack pine in Kobs KW Block was seven years old when it burned earlier this spring and was first occupied by Kirtland's warblers in 2009.

Kirtland's warbler (*Dendroica kirtlandii*), a federally listed Endangered species, is one of the rarest members of the wood warbler (Parulidae) family. Kirtland's warbler (KW) nest in just a few counties in Michigan's northern Lower and Upper peninsulas, and have only recently been found outside Michigan in Wisconsin and the province of Ontario. They nest nowhere else on Earth. Nests generally are concealed in mixed vegetation of grasses and shrubs below the living branches of five to 20 year old jack pine (*Pinus banksiana*) forests. Kirtland's warbler habitat on the Huron National Forest is managed within seven KWMA's under direction from the Kirtland's Warbler Recovery Plan (1976, revised 1985) and the Strategy for Kirtland's Warbler Habitat Management (2001).

The exhaust fire left 76 acres of habitat unburned. According to past monitoring efforts it is thought that the shape and size of the remaining habitat make it less desirable than larger contiguous blocks of habitat. Therefore, habitat suitability within this portion of the Pine River KWMA depends upon immediate reforestation of the entire Kobs KW block in order to provide a large-scale landscape of core habitat.

It is critical to regenerate the Kobs KW block to jack pine at densities suitable for Kirtland's warbler nesting habitat as soon as possible in order to meet Recovery Plan goals and Forest Plan direction.

1.2 Project Location

The Exhaust Fire KW Project Area is located on the Harrisvile Ranger District of the Huron-Manistee National Forests. The Exhaust Fire KW Project is approximately 341 acres in size and is located approximately 12 miles northwest of the city of Oscoda in Township 24 North, Range 7 East, Section 11 of Iosco County, Michigan. Management activities are proposed for implementation between the years 2010 and 2013. A Map of the proposed management actions is enclosed in Appedix A.2.

1.3 Proposed Action

Project proposals are designed to meet Forest Plan management objectives, to enhance the present condition of ecosystems, and to move the project area toward the desired future condition described in the Forests' Plan.

Proposed Actions include:

- Site prep approximately 341 acres of burned jack pine with mechanical methods
- Regenerate by planting 341 acres of jack pine to densities required for KW nesting habitat

Detailed information on the proposal is contained in Chapter 2, *Comparison of Alternatives*.

1.4 Management Direction

Various laws, regulations, and policies provide the framework for all levels of National Forest planning. Some of these include the Multiple Use Sustained Yield Act of 1960, the Clean Water Act of 1972, as amended, the Endangered Species Act of 1973, the Forest and Rangeland Renewable Resources Planning Act (RPA) of 1974, the National Forest Management Act (NFMA) of 1976, Regional Guides, Land and Resource Management Plans, and the current Forest Service Natural Resources Agenda.

Long-term management direction for the Huron-Manistee National Forests was established in the Huron-Manistee National Forests Land and Resource Management Plan (Forests' Plan), and accompanying Final Environmental Impact Statement (FEIS), approved in March 2006. The Forests' Plan and FEIS are land management planning documents required by the rules implementing the Forest and Rangeland Renewable Resources Planning Act of 1974, as amended by the National Forest Management Act of 1976. The Forests' Plan provides direction for the multiple-use and sustained yield of goods and services from National Forest System lands in an environmentally sound manner.

The Forests' Plan identifies more than 150,000 acres of essential habitat on State and federal lands. On the Huron National Forest, 88,000 acres of essential habitat is identified to be managed on a 40 to 70-year rotation; this amounts to an average of 1,600 acres to be developed into nesting habitat annually.

This analysis is tiered to the Huron-Manistee National Forests Final Environmental Impact Statement, Land and Resource Management Plan, and the accompanying Record of Decision, 2006.

The Forests' Plan incorporates the following documents, which contain important direction for the proposed project:

Kirtland's Warbler Recovery Plan (1976, revised 1985)
In compliance with provisions of Section 7 of the Endangered Species Act, as amended, a Kirtland's Warbler Recovery Plan (KW Recovery Plan) was prepared, outlining steps designed to increase the species' population. The primary objective of the Kirtland's Warbler Recovery Plan is to "reestablish a self-sustaining Kirtland's Warbler population throughout its known former range at a minimum level of 1,000 pairs".

Strategy for Kirtland's Warbler Habitat Management (2001)
The Strategy for Kirtland's Warbler Habitat Management (Strategy) updates and revises the Kirtland's Warbler Management Plan for Habitat in Michigan (1976), and provides guidelines for managing summer range and protecting individual Kirtland's warblers and their nesting habitat. This plan identifies seven Kirtland's Warbler Management Areas (KWMA) on the Huron National Forest. The Pine River KWMA is one of these areas. Each KWMA is divided into treatment blocks, with each block containing 200 acres or more of contiguous stands of essential habitat.

The following documents provide further analysis to the proposed project and are incorporated by reference in this environmental assessment:

Huron-Manistee National Forests Monitoring and Evaluation Report. Fiscal Years 1996 through 2009.
Monitoring and Evaluation Reports document the results of Forest Plan implementation by evaluating data and information gathered and the effectiveness of Forests' Plan Standards and Guidelines, and recommending a course of action to move the Forests forward.

Warbler Haven (2003)
Warbler Haven EA was the most recent analysis written for the Pine River KWMA. This analysis dealt with a similar purpose and need and environmental effects as the Exhaust Fire KW Project.

Warbler 67 Habitat and Klondyke Fuels Reduction Projects Environmental Assessment (2002)
Warbler 67 Habitat and Klondyke Fuels Reduction Projects EA analyzed the use of prescribed fire as an alternative to achieving the purpose and need for KW and fuels projects. This alternative is considered, but not studied in detail in the Exhaust Fire KW Project EA.

Queens Corner (1998)
Queen's Corner EA was the most recent analysis written for the project area (Kobs KW block). This analysis dealt with a similar purpose and need and environmental effects as the Warbler Haven EA.

1.5 Purpose and Need of the Proposal

Implementation of site-specific projects is guided by Forests' Plan direction through management prescriptions, which are designed to attain a desired future condition. The Exhaust Fire KW Project falls within Management Area (MA) 4.2 KW-Roaded Natural Sandy Plains and Hills, with an emphasis on Kirtland's warbler habitat management. The proposed activities address site-specific needs and opportunities designed to move the project area from the existing

condition to the desired future condition set forth in the Forests' Plan (Forests' Plan, pages II-1 through II-40, and III-4.2 through III-4.2-15).

General management area direction is to enhance and increase the variety of wildlife habitats with emphasis given to managing deer, grouse, wildlife and Kirtland's warbler essential habitat. Emphasis includes producing high volumes of timber products, providing a variety of recreation and visual opportunities, and reducing life-threatening and property damaging wildfire potential.

> The purpose of the Exhaust Fire KW Project is to regenerate essential nesting habitat for the Kirtland's warbler in compliance with the Kirtland's Warbler Recovery Plan and Strategy for Kirtland's Warbler Habitat Management after the loss of occupiable habitat that resulted from the Exhaust Fire.

Kirtland's warbler (KW) has very restrictive habitat requirements. In addition to being ground nesters, Kirtland's warblers prefer jack pine stands over 200 acres in size. Those stands, which are most suitable for breeding, are characterized by having dense clumps of trees interspersed with numerous small, grassy openings, sedges, ferns, and low shrubs. The birds nest on the ground under the living branches of the small trees. Jack pine stands are used for nesting when trees are about five feet high or about five to eight years of age. Nesting continues in these stands until the lower branches of the trees start dying, or when the trees reach about 16 to 20 years of age. A breeding pair of warblers usually requires about ten to 20 acres for their nesting territory within suitable habitat.

Fire always has been an important disturbance factor in the jack pine barrens. Young jack pines, upon which Kirtland's warbler depend, grow after fire removes older trees and rejuvenates the forest. Heat from fire opens jack pine cones on mature trees to release seeds. Fire also prepares the ground for germination of the seeds.

Modern wildfire suppression has reduced much of the natural disturbance that sustained Kirtland's warbler habitat for thousands of years. Without wildfire, land management agencies must take an active role in conserving and enhancing the jack pine ecosystem through active habitat management, under the guidance of the Kirtland's Warbler Recovery Plan, to ensure a sustained supply of occupiable habitat over the long term.

"Essential habitat" in Kirtland's Warbler Management Areas (KWMAs) is regulated for sustained yield of warbler nesting habitat and commercial timber production. Forest Plan direction specifies that a minimum of 1,600 acres of suitable nesting habitat be created annually on the Huron National Forest. Where possible, 15 to 25 percent of each Kirtland's Warbler Management Area is developed into nesting habitat every decade. Treatment blocks in each management area are sequentially scheduled for habitat development, close to other blocks in space and time, because larger blocks of habitat are more desirable to Kirtland's warblers, and to better mimic the effects of large scale wildfires. Nesting habitat is distributed across and within KWMAs to minimize the risk of catastrophic losses due to wildfire and other causes.

When Essential habitat is consumed by wildfire, these burned areas are evaluated, documented and analyzed to determine if they will provide future occupiable KW habitat to be incorporated into habitat planning. The Exhaust Fire burned the Kobs KW block which had just been planted in 2005. Trees in the block were only seven years old. Since jack pine does not reach cone-bearing maturity until approximately age 25 years, the Kobs KW block lacks the cones necessary for natural regeneration by this wildfire.

This project is needed to continue the ongoing management for Kirtland's warbler recovery on the Huron National Forest. In compliance with the *Huron-Manistee National Forests' Land and Resource Management Plan* (Forests' Plan, March 2006), a minimum of 1,600 acres of future breeding and nesting habitat must be created annually on the Huron National Forest to ensure the sustainability and recovery of this population. There is a need to regenerate this area back to pre-wildfire conditions to provide suitable nesting habitat for the Kirtland's warbler.

Project Objectives

The following project objectives are based on the purpose and other objectives of MA 4.2 KW and the Strategy for Kirtland's Warbler Habitat Management, and will be used as a means to measure how each of the alternatives achieves Forests' Plan goals and objectives.

- Maintain and regenerate essential nesting habitat for the Kirtland's warbler in compliance with the Kirtland's Warbler Recovery Plan.

- Reduce the potential for intense wildfires by reducing hazardous fuels.

Hazardous Fuels Reduction

Management Area direction includes reducing life-threatening and property-damaging wildfire potential (III-4.2-2). The Exhaust Fire KW project area is in the Oscoda West Central township, a wildland/urban interface community which is identified in the Federal Register (8/17/01) as a community at risk.

Forest replacement fire regime classes (FR) are a generalized description of the role fire plays in an ecosystem characterized by fire frequency, predictability, seasonality, intensity, duration, scale (patch size), as well as regularity or variability. All of the Exhaust Fire KW project area falls into FR 1, a landscape ecosystem historically experiencing very frequent wildfires ranging from low to moderate-intensity surface fires to large, high-intensity, stand-replacing fires.

The Exhaust Fire killed 260 acres of densely stocked jack pine, but did not consume the needles or trees. The resulting condition poses a significant risk for re-burn, and threatens the essential habitat immediately adjacent to this block. There is need to implement projects in the project area that reduce these fuels, in order to reduce the risk of another catastrophic wild fire and the further loss of occupied habitat within the Pine River KWMA.

1.6 Decision Framework

This Environmental Analysis (EA) evaluates site-specific concerns and opportunities, considers alternatives, and analyzes the effects of the proposed action and alternatives for the Exhaust Fire KW Project. The District Ranger must decide whether or not to implement the proposed activities based on the actions and methods, location of actions, and project requirements and mitigations presented in the analysis, and whether the project will have a significant impact on the quality of the human environment, which would require the preparation of an EIS.

1.7 Public Involvement

Scoping is a process for gathering comments about a site-specific proposed federal action to determine the scope of issues to be addressed and for identifying unresolved issues relating to the proposed action (40 CFR 1501.7).

Planning direction and guidance for Exhaust Fire KW was obtained from the Forests' Plan, other existing Forest and district planning documents, other applicable federal and state planning documents, and a project initiation letter from the District Ranger.

An interdisciplinary team (ID team) of resource specialists gathered information from the project area to determine how to best implement Forests' Plan direction. Needs and opportunities were identified that would move the area from the existing condition to the desired future condition outlined in the appropriate Management Area in the Forests' Plan, and proposed actions were developed by the ID team. Comments on the proposed actions were solicited from Forest Service employees, members of the public, adjacent property owners, and public and private agencies and organizations through solicitation in the Oscoda Press on August 25, 2010, and a scoping and comment package mailed to interested publics on August 25, 2010.

A copy of the scoping and comment package, the list of individuals and organizations contacted, and a disposition of comments received, are included in the Project File, in the Comments from Scoping Section.

1.8 Key Issues

Issues typically result from discussion, debate, and disagreement regarding the resource impacts directly related to the proposed activities. In order to provide concise analysis, the agency distinguishes between key issues used in the analysis for formulating alternatives, and other comments and concerns used to track effects and develop mitigation.

As determined from review by the Responsible Official and the Interdisciplinary Team, one key issue was identified.

Approximately 76 acres of the Kobs KW block was left unburned. This unburned area is a long narrow band of poorly stocked jack pine. During the 2010 Kirtland's warbler Census several weeks after the fire occurred, five

singing males were documented within this habitat. It is unknown how long this habitat will continue to be used by Kirtland's warbler. However, past monitoring demonstrates that small, isolated, poorly stocked habitat is not preferred, nor is it used in duration. Kirtland's warblers usually use suitable habitat for approximately ten years. It is suspected that if left untreated, this long, narrow, unburned area would be used for only half that time. If this area is not regenerated with the rest of the Kobs KW block, this 76 acre unburned area would represent a small, isolated, poorly stocked stand of jack pine that is six years older than the habitat in the rest of the KW block.

While regenerating this portion of the project area would displace the five pairs found during the 2010 Kirtland's warbler census, it is likely that they would move into adjacent suitable habitat in the Powerline, Dinosaur Valley, or Queen's Corner KW blocks. Treating the unburned area would result in a temporary loss of habitat, but it would be planted immediately back to jack pine at KW densities and would be occupiable in four to five years. This portion of habitat (76 acres) represents 1.32% of the occupiable habitat in the Pine River Kirtland's Warbler Management Area (76 of 5,752 acres) sub-population and 0.73% of the 10,280 acres of occupiable habitat across the Huron National Forest. Managing the entire Kobs Block as a contiguous stand of same-aged habitat is preferred in order to optimize the future production of young Kirtland's warbler.

Availability of the Planning Record

A consideration in preparation of this environmental assessment has been the reduction of paperwork as specified in 40 CFR 1500.4. The objective is to furnish enough site-specific information to demonstrate a reasonable consideration of the environmental impacts of the alternatives and how these impacts might be mitigated. The Planning Record contains detailed information used in the analysis and is available upon request at the Huron-Shores Ranger Station.

Chapter 2: Comparison of Alternatives, Including the Proposed Action

Alternatives, developed by the interdisciplinary team in accordance with 40 CFR 1502.14, display a range of options which could be implemented to fulfill the purpose and need for action and to address any unresolved issues regarding the management of the Exhaust Fire KW Project area.

This chapter describes each alternative considered in this analysis. This section also presents the alternatives in comparative form, defining the differences between each alternative and providing a clear basis for choice among options by the decision maker and the public. This comparison is based on the objectives identified in Chapter 1.

Project design criteria used to reduce adverse impacts to resources are included for each alternative.

2.1 Alternatives Not Considered in Detail

Alternatives that involve treating this area to produce timber instead of focusing management on producing Kirtland's warbler habitat were eliminated from detailed study. Focusing primarily on timber management would neither meet the purpose and need of this project nor the objectives of the Forests' Plan.

An alternative that would treat only the 260 burned acres rather than the entire 341 acres was considered but eliminated from detailed study. Habitat suitability within this portion of the Pine River KWMA depends upon immediate regeneration of the entire Kobs KW block in order to provide a large-scale landscape of core habitat. The 76 acres of currently suitable habitat that was unburned may be occupied by Kirtland's warbler as long as five years, but is unlikely to be occupied for the usual ten years, as previous monitoring results suggest. Treating only the burned area would not create optimal conditions for Kirtland's warbler because as the unburned 76 acres matured, it would quickly become a barrier in the middle of the surrounding regenerated block.

2.2 Alternatives Considered in Detail

Two alternatives are considered in detail, Alternative 1 (The No Action Alternative), and Alternative 2 (The Proposed Action). Alternative 1 analyzes the effects of deferred treatment (no management activities taking place at this time). Alternative 2 follows management direction established in the Forests' Plan and the Strategy for Kirtland's Warbler Habitat Management, as described in Section 1.4 of this document.

Alternative 1
The No Action Alternative

Under the No Action alternative, no projects would be implemented in the project area at this time. Changes to vegetative structure and composition would occur only as the result of natural progression. No vegetation or wildlife management would take place. Current uses of the area would continue until such uses are prohibited by changed environmental conditions. Minimal management such as periodic road maintenance would continue.

This alternative does not consider the regulation of Kirtland's warbler essential habitat for sustained yield of warbler nesting habitat. The average annual regeneration treatment objective for the Pine River KWMA would not be met, and no progress would be made toward the Forests' Plan desired age class distribution of Kirtland's warbler essential habitat in the management area.

This alternative provides a baseline by which to compare the action alternatives.

Alternative 2
The Proposed Action

Direction provided in the Forests' Plan and the *Strategy for Kirtland's Warbler Habitat Management (2001)*, and internal concerns were incorporated into Alternative 2 – The Proposed Action. The proposed action is designed to achieve the primary purpose of Management Area 4.2 KW. The Exhaust Fire KW Proposed Action Map, Appendix A.2 shows the proposed project areas and management activities.

A summary of the proposed federal action is as follows:

- Site prep approximately 341 acres of burned jack pine with mechanical methods
- Regenerate by planting 341 acres of jack pine back to densities required for KW nesting habitat

Table 1; Alternative 2 - Vegetative Management Proposals by Compartment, Stand, and Forest Type (All acreages are approximate)

Compartment	***Stands***	***Acres***	***Forest Type***	***Prescription***
333	08	336*	013	Site prep, plant
333	17	5 of 27*	014	Site prep, plant

Design Criteria applied to Alternative 2, the Proposed Action

Design Criteria for Exhaust Fire KW EA

Management requirements, mitigation measures, and monitoring, as detailed in the Forest Plan, are features common to all of the action alternatives. In response to the site-specific proposal, the following design criteria would be applied to Alternative 2:

Restrict mechanical equipment for site-prep, within ¼ mile of occupied habitat from May 1 through August 15, to minimize disturbances to Kirtland's warbler during their breeding season.

Within ¼ mile of occupiable habitat planting operations should be designed to begin nearest to the occupiable habitat on the north end, as early in the spring as practical and then proceed south away from the occupiable habitat. The desired effect of planting in this manner is to treat the adjacent areas before Kirtland's warblers return to occupiable habitat (May 15) in order to minimize disturbance.

Retain all snags and dead and downed woody debris >8 inch dbh, and retain at least two mast trees per five acres.

Any cultural resource sites found during implementation of project actions would be protected in accordance with standard timber sale contract clause BT6.4.

2.3 Summary Comparison of Alternatives

The following figure provides a summary of how the alternatives compare in terms of Chapter 1 objectives.

Table 2; Project Purpose and Need Indicators and Outputs, Summary Comparison of Alternatives (All acreages are approximate)

Purpose and Need Indicators and Project Objectives	**Alternative 1 – No Action**	**Alternative 2 – Proposed Action**
Wildlife Habitat Indicators		
Kirtland's warbler nesting habitat created (acres)	0	341
Fuels Reduction Indicators		
Acres of project area fuels treated	0	341

Chapter 3: Environmental Consequences

This section summarizes the physical, biological, social, and economic environments of the affected project area and the potential changes to those environments due to implementation of the alternatives. It also presents the scientific and analytical basis for comparison of the alternatives.

Chapter IV of the Forests' Plan EIS (pages 5-9) discusses the practices of even-aged silviculture and its impacts to vegetation when utilized in forest management. The remaining pages of the chapter discuss cumulative effects of ten individual environmental elements such as soils, vegetation, wildlife, etc. Proposed project conditions are typical of those discussed in the Forests' Plan EIS. This analysis tiers to the EIS discussions. The actions proposed in the alternatives presented are consistent with the direction of the Final Environmental Impact Statement for the Forests' Plan and the Forests' Plan.

Chapter 3 is organized by resource. Following is an outline of how each resource section is organized:

- *Analysis Bounds* This is a description of the geographic area used for cumulative effects analysis that is specific to the resource.

- *Affected Environment* This section briefly describes the current condition (affected environment) of the resource in the project areas, and how past activities have affected that condition.

- *Direct and Indirect Effects* This section describes the direct and indirect effects of each alternative on the present condition of the resource. Generally, direct effects are caused by the action and occur at the same time and place as the action. Indirect effects are caused by the action but occur later in time or are spatially removed from the action. Direct and indirect effects can be beneficial or detrimental. The Direct, Indirect and Cumulative effects of Alternative I will all be described under the heading *Effects of Alternative I*. Because there is no action to cause a direct, indirect or cumulative effect, the effects written in this section are actually the consequences of not taking any action in a dynamic environment.

- *Cumulative Effects* Cumulative effects include not only the effects of the proposed actions, but may also include the effects of past actions and reasonably foreseeable future actions on the resource. This section includes effects extending well outside project boundaries. Project boundaries include those specific areas where actions are proposed. Analysis boundaries for cumulative effects analysis is described in the *Analysis Bounds* (above) for each resource section.

Acreages used for analyses in this environmental assessment are GIS acres. All acreages are approximate.

3.1 Present Condition and Effects of the Alternatives

Biological Factors

A. Vegetation

Analysis Bounds

Analysis area boundaries will include Pine River KWMA essential habitat within the Kirtland's Warbler Emphasis Areas (MA 4.2) defined by the *Huron-Manistee National Forests Land and Resource Management Plan (2006)* for cumulative effects analysis of the following resources *Biological Factors* including vegetation and wildlife. This area covers approximately 20,542 acres. The essential habitat identified is entirely National Forest System lands. This area consists primarily of red pine plantations, upland jack pine and jack pine/oak, within a pine barren ecosystem Land Type Association 1 (LTA 1). The forests of LTA 1 consist primarily of species adapted to xeric conditions and frequent fire, including jack and red pines, black, and white oaks. Before settlement, the flat sandy outwash plains were prone to fire and dominated by jack and red pines. Small surface fires were undoubtedly very frequent. Other forest types, such as aspen or white pine, occur in isolated stands or as inclusions within stands and add diversity at the stand level. They do not occur at a large enough scale to be considered separate community types or functioning ecosystems.

The primary purpose of Management Prescription Area 4.2KW, the Pine River KWMA, and this project, is to maintain and develop essential nesting habitat for the Kirtland's warbler in compliance with provisions of Section 7 of the Endangered Species Act and as outlined in the Kirtland's Warbler Management and Recovery Plan (USDI-Fish and Wildlife Service 1985) and Strategy for Kirtland's Warbler Habitat Management (USDA-Forest Service 2001). **Essential habitat is that land identified as biologically appropriate and necessary for the development of nesting habitat for the Kirtland's warbler.** Essential habitat is designated by the Regional Forester from the USDA Forest Service and the Director of the Michigan Department of Natural Resources. Essential habitat occurs in significant acreages on both state and federal lands. The government agencies responsible for land management are working together, sharing information to coordinate habitat development on a statewide basis. After field examination and stand data analysis, most of those stands that were believed to be manageable for nesting habitat were identified as essential habitat. At present, Kirtland's warbler habitat is managed in 24 Kirtland's Warbler Management Areas (KWMAs) - 17 on State Forests and seven on the Huron National Forest.

Essential habitat in KWMAs is regulated for sustained yield of warbler nesting habitat and commercial timber production. Forests Plan direction specifies that a minimum of 1,600 acres of suitable nesting habitat be created annually on the Huron National Forest. Where possible, 15 to 25 percent of each Kirtland's Warbler Management Area is developed into nesting habitat every decade. Treatment blocks in each management area are sequentially scheduled for habitat development starting with the first block and progressing to the last over the planning period (on a 40 to 70 year rotation). Treatment blocks are scheduled for regeneration close to other blocks in space and time, because larger blocks of habitat are more desirable to Kirtland's warblers, and to better mimic the effects of large scale wildfires. Some essential habitat may be managed on a shorter rotation. Nesting habitat is distributed across and within KWMAs to minimize the risk of catastrophic losses due to wildfire and other causes.

Affected Environment

General Land Office Surveys from 1766 through 1856 indicate that the analysis area was predominantly occupied by extensive jack pine stands and pine barrens (defined in Michigan Natural Features Inventory as "a coniferous savanna of scattered and clumped trees located north of the transition zone"), commonly referred to as the "jack pine plains" of northern lower Michigan. Given the serotinous nature of jack pine cones and adaptations of associated plant species, fire has played a long-term and dominant role in shaping the plains landscape. Key elements of this ecosystem include deep, excessively drained sand soils (Grayling sands) with low nutrient holding capacity, and forest species that are well adapted to fire such as jack pine and northern pin oak. The analysis area is predominantly flat, with little relief.

The analysis area for the vegetation section of the Exhaust Fire KW Project is approximately 20,542 acres, all of which is designated essential habitat for the Kirtland's warbler.

Past vegetative management actions

Approximately 3,692 acres were regenerated in the Pine River KWMA from 2001-2009 to create Kirtland's warbler essential habitat.

Current vegetative management actions taking place within the analysis area include:

Planting of previously sold and cut warbler treatment blocks is ongoing annually. A planting schedule coinciding with harvested units is developed to attain maximum Kirtland's warbler habitat across the Pine River KWMA. In 2010, the King WUI KW block were planted (294 acres), and 75 acres were planted in the Charlie Horse KW block.

Two timber sales that included Kirtland's warbler habitat creation from the Warbler Haven Environmental Assessment are currently being cut (Charlie Horse KW block and the Bugs N Bears KW block). Harvesting and planting of these two treatment blocks will contribute an additional 440 acres toward the regeneration objective for the Pine River KWMA.

Future vegetative management actions scheduled in the analysis area following the Exhaust Fire KW Project include: King WUI, King's Corner, Charlie Horse, Golden Gopher, Deer Run and Snowbird KW blocks.

The Forests Plan annual objective for Kirtland's warbler habitat creation is 1,600 acres. The Snowbird KW EA is currently proposing Kirtland's warbler management within the Pine River KWMA as well. The Snowbird KW EA, which

is being developed concurrently with the Exhaust Fire KW EA, proposes to manage approximately 717 acres as future Kirtland's warbler nesting habitat. The continued development of the Pine River KWMA is a vital part of the Forests' goals, as described in the Strategy for Kirtland's Warbler Habitat Management and the Forests' Plan.

Direct and Indirect Effects of Alternative 1 **[Vegetation]**

There would be no direct effects to forest vegetation as a result of the No Action Alternative. Project area stands dominated by dead jack pine and northern pin oak would continue to deteriorate. Some oak would likely regenerate from stump suckers, but the stand would unlikely to be fully stocked without planting. Herbaceous species such as sedge, blueberry, and warm season grasses would continue to dominate the understory. Numbers of snags and downed woody material would increase. Natural fuel-loading would increase the chances of a large wildfire, which may threaten adjacent occupied habitat in the Pine River KWMA.

Alternative 1 would not contribute to the spread of noxious weeds, such as spotted knapweed and St John's wort found in the project area. In contrast, it would also not help to control the spread of noxious weeds.

Alternative 1 would have no direct or cumulative impacts on rare plant species because none were found in or near the treatment area. There would be potential habitat for some pine barrens species as this area would likely remain open in the foreseeable future.

The No Action Alternative would not promote Forest Plan goals and objectives for this management area. The jack pine component of the analysis area would not be regenerated and managed at age classes required for KW nesting habitat. The no action alternative would not regenerate essential nesting habitat for the Kirtland's warbler, and would not reduce fuel loads to reduce the potential for catastrophic wildfire.

Direct and Indirect Effects of Alternative 2 **[Vegetation]**

Approximately 341 acres would be site prepped and planted to densities required for Kirtland's warbler nesting habitat. Age class distribution of the Pine River KWMA essential habitat would be maintained as this treatment would replace the 0-10 year age class of jack pine that was lost in the Exhaust Fire. Vegetative composition and age classes of the essential habitat in the management area would be similarly remain the same as breeding habitat for Kirtland's warbler would be replanted. This alternative moves the management area closer to the regulated KW nesting habitat established in the Strategy for Kirtland's Warbler Habitat Management and the Forests' Plan.

Site preparation for planting would be accomplished through rollerchopping, hydro-axing, use of a V-plow or scalper, or a combination of methods to reduce slash and facilitate regeneration of jack pine seedlings. This action would have no direct effect on the burned portion of the project area because the vegetative component was lost in the wild fire. Within the 76 acre unburned portion, all treatments would directly affect residual plants on the site by crushing or cutting the vegetation. No vegetation would actually be removed by the treatments and most plants would resprout within one growing season following treatment. Plants such as warm season grasses and blueberries often resprout vigorously and benefit from these treatments.

The objective in these stands is to reforest and produce fully stocked jack pine stands at densities used by Kirtland's warblers for nesting habitat. Reforestation generally involves planting in furrows created by a V-plow, which removes immediate competition from shrubs and grasses. Forest canopy would develop over these areas as the jack pine matured. Oak would remain a component of the forested stands, as the oak is stimulated by cutting.

Disturbance and open conditions created by the wildfire could create a favorable environment for the spread of noxious weeds, such as spotted knapweed, and St. John's wort that are present within the treatment blocks, but reforestation of dense jack pine as proposed would impede the establishment of the noxious weeds within three to four years of planting and should prevent NNIS plants from becoming further established in the project area.

The proposed action would have no direct impacts on rare plant species because none were found in or near the treatment area.

There would be indirect beneficial effects to barrens species from the wildfire and resulting vegetation removal (site prep), because fire was a historically important disturbance factor that maintained an open understory allowing these shade intolerant species to compete with other vegetation. Mechanical site prep and planting treatments also expose

mineral soil, which is necessary for seedling establishment of most of these species. These treatments would also reduce the intensity of potential wildfires and improve health and vigor of residual trees.

Cumulative Effects of Alternative 2 **[Vegetation]**

Future actions, together with past and present actions in the analysis area would continue to follow guidelines set forth in the Strategy for Kirtland's Warbler Habitat Management and the Forests' Plan. The focus of the analysis area management would continue to be the regulation of large tracts of jack pine for KW nesting habitat. Vegetation types and age class diversity within the analysis area would continue to move toward the Forests' Plan desired condition.

B. Wildlife

Introduction

Although wildlife species each have their own individual habitat requirements, similar needs allow a general grouping of species associated with common community types. This section addresses how implementation of the alternatives would affect wildlife species associated with the current vegetative community types of the project area, by comparing the changes from the existing condition (baseline) to the expected vegetative response to management. Specifically, it describes current wildlife habitat conditions (suitability of habitat) and the expected changes in suitability based upon implementation of the proposed alternatives. Wildlife habitat suitability is influenced by many factors. In the context of this document, the most important factor affecting wildlife species is the resulting change of vegetative composition (including changes that occur spatially and temporally), and the associated affects of the processes that facilitate that vegetative change. Simply stated, wildlife species are directly affected by the act of removing trees through timber harvest activities and by reforestation activities (site preparation and tree replacement both natural and artificial). Wildlife species are indirectly affected by the resulting habitat conditions and vegetative response to management. Wildlife species are also cumulatively affected by the combination of these conditions, past actions, and those created by other adjacent expected actions over time.

The Huron-Manistee National Forests have selected six Management Indicator Species (four wildlife species) due to "their emphasis in planning, and which are monitored during forest plan implementation in order to assess the effects of management activities on their populations and the populations of other species with similar habitat needs which they may represent" (Forest Service Manual 2620.5, Washington Office Amendment 2600-91-5). Management Indicator Species (MIS) and standards and guidelines for their management can be found in the Forests' Plan (p. II-31-34). MIS provide a means of monitoring and evaluating the effects of actions on biotic resources, including specific species, communities, habitats, and interrelationships among organisms. Effects to wildlife ETS (Federally endangered, threatened, and Regional Forester's Sensitive species) are addressed in the Biological Evaluation located in the project file.

The primary purpose of the Exhaust Fire KW project is to regenerate habitat suitable for nesting Kirtland's warblers. The analysis of the effects of the project alternatives on wildlife will therefore, focus on how the different alternatives compare at accomplishing this objective. It will also address how changes in habitats would affect other associated wildlife species and analyze effects to MIS species.

Analysis Bounds

Analysis area boundaries for cumulative effects analysis of vegetation will include Pine River KWMA essential habitat within the Kirtland's Warbler Emphasis Areas (MA 4.2) defined by the *Huron-Manistee National Forests Land and Resource Management Plan (2006).* This area covers approximately 20,542 acres. The essential habitat identified is entirely National Forest System lands. This area consists primarily of red pine plantations, upland jack pine and jack pine/oak, within a pine barren ecosystem (LTA 1). Other forest types, such as aspen or white pine, occur in isolated stands or as inclusions within stands and add diversity at the stand level. They do not occur at a large enough scale to be considered separate community types or functioning ecosystems.

Biodiversity in the Pine River KWMA According to Hunter, (1990), biodiversity is often measured by species richness (number of species present) and species evenness (distribution of abundance among different species). Species richness in dry forests tends to be lower than forests on moister sites. Species evenness in these dry forests tends to be low as well. The short rotation conifer (SRC) stands of the Pine River KWMA tend to be dominated by jack pine, with a smaller percentage of northern pin oak. The long rotation conifer (LRC) stands tend to be

dominated by red pine (usually as plantations), with a small percentage of northern pin oak and jack pine interspersed within stands. The ground vegetation consists of plants that can survive fire, drought, and thermal extremes. There is a mosaic pattern of sedges, shrubs, or grasses and forbs. The essential Kirtland's warbler habitats in the Pine River KWMA are also predominantly jack pine stands and red pine plantations located on dry sand plains managed as dense patches interspersed with numerous small openings.

The management plan for creating and maintaining occupiable KW nesting habitat, provides for large treatment blocks (200+ acres) of jack pine that vary from regenerating to maturing in age. Recently treated blocks provide habitat for open grassland and early successional species such as upland sandpipers, prairie warblers, eastern bluebirds, eastern kingbirds, thirteen-lined ground squirrels, and Lincoln's sparrows. When the regenerating jack pine is approximately 6 years old, a stand is suitable for Kirtland's warbler as well as some of the species mentioned above. Hermit thrush, clay-colored sparrows, and others also move in. As a stand becomes 15-20 years of age, it grows beyond suitability for the Kirtland's warbler and many of the other species associated with young-growth jack pine. By then, such species as red squirrels, pine warblers, and spruce grouse may begin to use the stand along with other species associated with maturing jack pine. The Kirtland's Warbler Management and Recovery Plan provides detailed guidelines for management activities needed to maintain essential habitat for a viable population of Kirtland's warblers.

Mid to late aged upland conifer habitat in the Pine River KWMA is comprised mainly of jack pine, jack pine/oak, and mixed stands of red pine with oak and white pine, as well as red pine plantations. These habitats provide cover at multiple vertical layers, and are utilized by a wide diversity of wildlife species. Squirrels, an important prey species to predators such as hawks, bobcat and coyote, occur in this habitat type where oak is a component. Neo-tropical migrant birds such as the palm warbler, pine warbler and Nashville warbler also forage and nest among the upper branches of these conifer species. Other species that forage among the pines include pileated woodpeckers, black-capped chickadees, and dark-eyed juncos.

Conifer species also provide important thermal cover and windbreaks and are utilized by a wide variety of wildlife species seeking shelter from inclement weather. Some stands of decadent and over mature jack pine also occur. These stands provide dead and down woody debris for a variety of wildlife species.

Water sources are a limiting factor across most of the Pine River KWMA, and especially within the project area. The project area has no open water source, however the Au Sable River runs approximately two miles to the south. This lack of water in the project area results in a loss of biodiversity among species requiring aquatic habitat types for part or all of their life cycle.

Species richness and evenness are also influenced by such within stand characteristics as structural and vertical diversity, and the availability of coarse woody debris (CWD) such as snags and downed logs. For this document, structural diversity includes both vertical diversity and horizontal diversity. Vertical diversity is greatest in forests that are well stratified and are uneven aged. Stands that are even aged, such as those found in the project area, have reduced foraging and nesting opportunities for songbirds. This, along with the lack of plant diversity, further diminishes species richness and evenness. However, jack pine is a notable exception, having the richest assortment of insect life and higher abundance when compared to other conifer species. The abundant insect life makes jack pine uniquely attractive to neo-tropical migrant birds, with higher suitability than red pine stands or mixed red pine/jack pine. Due to an inherent lack of large diameter trees on the sandy outwash planes, large coarse woody debris is lacking. Consequently, prey species such as rodents find their habitat needs (cover and structure), are diminished. Amphibian and reptile species that are associated with conifer forest types are often closely associated with the amount of large CWD present. It can be assumed that habitat needs for species such as the red-backed salamander and garter snakes are limited due to the lack of moisture and lack of CWD. Forest's Plan guidelines call for retention of 15-25 snags per acre in Kirtland's warbler areas. However, in the project area the availability of snags is limited from prior management and the relatively young age (seven years) of the stand when the wildfire occurred. Project design criteria stipulates that all snags > 8 inch diameter at breast height (dbh) be left in the Exhaust Fire KW Kirtland's warbler treatment blocks to provide for this important within stand component.

Fragmentation Fragmentation is a concern for species that are area sensitive, such as neo-tropical migrants, or inherently rare, such as the Kirtland's warbler. Fragmentation, which is the breaking up of continuous habitats, produces many changes in the landscape such as a reduction in mature forest, increased edge, reduced interior areas, and increased isolation in the remaining interior area. Fragmented areas tend to result in greater predation on songbird nests by blue jays, grackles, raccoons, and skunks and particularly parasitism by brown-headed cowbirds (*Molothrus ater*).

The second most significant threat to the survival of Kirtland's warbler is parasitism by cowbirds. Brown-headed cowbirds evolved following herds of American bison across the prairies ecosystems of the Great Plains and feeding on the insects they kicked up as they walked. Constantly moving with the buffalo, brown-headed cowbirds would lose their food source if they stopped to spend the time required for nesting and brood-rearing. So they adapted a strategy of laying their eggs in the nests of other host birds who would then raise the young cowbirds as their own. The cowbird chicks hatch first and out-compete the host chicks for resources. Over time these host birds developed strategies to cope with parasitism from brown-headed cowbirds. Since then, agriculture expansion and forest clearing in the midwest and eventually into the lower peninsula of Michigan in the late 1800's, resulted in the cowbird expanding its range into Kirtland's warbler nesting areas. Kirtland's warblers, and many other eastern birds have not adapted to parasitism from cowbirds and have no natural defenses and therefore are particularly vulnerable. Before the implementation of a brown-headed cowbird control program in 1972, Dr. Larry Walkenshaw (1972) found that between 1966-1971, 69 percent of Kirtland's warbler nests he examined contained cowbird eggs.

The U.S.D.I. Fish and Wildlife Service (FWS) annually conduct a brown-headed cowbird control program, to reduce the threat of cowbird parasitism on Kirtland's warblers. In his 2003 report to the Kirtland's Warbler Recovery Team, FWS biologist Chris Mensing stated that the "Kirtland's warbler population had increased to a record level, most likely due to successful, extensive habitat management and brown-headed cowbird control." This control program removes local cowbirds from KW nesting areas, but over its 33 year history, has had virtually no effect on the populations of cowbirds throughout Michigan. Brown-headed cowbirds from agricultural areas outside of KWMAs produce a continuing supply of birds which disperse into KWMAs and threaten the future of Kirtland's warblers. Mensing's report states, "The survival and recovery of Kirtland's warbler depends on continued habitat management and annual cowbird control" (Mensing, 2003).

Direct and Indirect Effects of Alternative 1 **[Wildlife]**

Under the No Action Alternative, activities would be deferred. Since there are no activities associated with this alternative there would be no direct effects.

Currently, the project area has two separate vegetative conditions. The unburned portion, 76 acres of the project area, has suitable habitat (stands of 6-15 year old jack pine) for Kirtland's warbler. The Exhaust Fire consumed the rest of the project area (260 acres) so that it is no longer suitable for Kirtland's warbler. Under the No Action alternative no habitat would be regenerated, no areas would be planted and proposed treatments would be deferred. The burned area would likely continue to convert to northern pine oak, and would reduce the suitability of the 76 acre unburned area as the oak trees mature and the area transitions from open to forested. The 76 acres of currently suitable habitat may be occupied by Kirtland's warbler as long as five years, but is unlikely to be occupied for ten years, as previous monitoring results suggest. The result would be an immediate loss from the wildfire of 260 acres, and an additional future loss of 76 acres when the unburned habitat becomes unsuitable.

The burned portion of the project area would not regenerate to Kirtland's warbler habitat since the jack pine trees were immature when they burned and therefore did not have the cones or seed necessary for natural regeneration. Therefore, there is no opportunity for the burned portion of the project area to naturally support Kirtland's warbler in the foreseeable future. This would create a deficit of nesting habitat within the Pine River KWMA and across the Huron National Forest. It would also create a wider gap between suitably aged stands in the Pine River KWMA and reduce the suitability of this Management Area for Kirtland's warbler at the landscape level. This lack of action would not follow direction in the Forests' Plan, the Strategy for Kirtland's Warbler Habitat Management or the Kirtland's Warbler Recovery Plan. Therefore, Alternative 1 – No Action would not meet the objectives of the project area and would have an adverse indirect affect on habitat creation and suitability for Kirtland's warbler.

Vegetative Composition Implementation of the No Action Alternative would not significantly alter the existing vegetative community and composition, but would affect the age structure over time. Since the wildfire, these stands would convert from jack pine to northern pin oak. Over the long term Alternative 1 would result in static or decreasing wildlife and vegetative diversity as this stand would likely convert to a poorly stocked northern pin oak. As younger aged stands mature and the canopy closes, and open areas fill in from woody encroachment, grassy species such as wild Canada rye, Indian grass, and big bluestem will only be found along roadsides. Species of wildlife requiring openings, early successional habitat, and mid – successional habitat would benefit from this alternative. Overall, species richness and evenness would decrease over time.

Structural Diversity Vegetative types would remain similar to current conditions, with a conversion from short rotation conifer (jack pine) to northern pin oak in the project area. There would be a continual loss of horizontal structural diversity over time as limbs die, loose their needles and eventually slough off. Vertical structural diversity would gradually increase as trees die, over the long term. Eventually, small openings in the canopy caused by tree mortality would result in a developing understory and midstory. With the improved structural diversity created within these stands, plant and animal diversity will increase. Species that require coarse woody debris would slowly benefit by this alternative including rodents, insects, and reptiles.

Fragmentation Fragmentation would not increase under the No Action Alternative. Fragmentation would remain the same or slightly decrease from current conditions, over the next decade, as young stands of northern pin oak mature and small openings fill in from woody encroachment. Landscape conditions will remain in the same proportions as they are currently. Oak seedlings can also fill in openings left to provide foraging and nesting habitat. Retention of more than 2 mast trees/acre has the effect of creating a two-story stand. Too many mature trees cause the area to lose its openness and reduces the suitability of the stand through fragmentation. The adverse effects of fragmentation would still occur under this alternative, and they would be larger compared to the action alternative.

Direct and Indirect Effects of Alternative 2 **[Wildlife]**

SUITABILITY FOR KIRTLAND'S WARBLER

Currently, there is occupied habitat within and adjacent to the project area. Since these adjacent areas are within 1/4 mile of the project area, proposed treatments would need to be restricted from occurring within the occupied period to prevent disturbances to nesting and brood-rearing. This is addressed by project design criteria (please refer to page 11).

This alternative has the potential to create long term indirect beneficial effects by creating and maintaining occupiable habitat into the foreseeable future within the Pine River KWMA.

Specifically, this alternative would indirectly benefit Kirtland's warbler by creating approximately 341 acres of occupiable Kirtland's warbler breeding and nesting habitat. Treatment of this habitat would not be limiting to Kirtland's warbler because suitable habitat occurs immediately adjacent to the project area in the Powerline, Dinosaur Valley, and Queen's Corner KW blocks. Birds would move into this habitat temporarily until the jack pine planted in the project area is suitable.

The unburned portion of the habitat (76 acres) is currently suitable habitat and occupied. Removing 76 acres of occupied habitat would cause short-term indirect adverse affects. The 76 acres of suitable habitat are proposed for regeneration at this time in order to create one large, contiguous block of same aged jack pine for long term benefits to Kirtland's warbler breeding and nesting habitat.

Kirtland's warbler habitat regeneration would enhance the overall suitability of the Pine River KWMA, and would compliment recently created habitat in the Postal Britt and Charlie Horse KW Blocks. Regenerating habitat would indirectly benefit the future viability of Kirtland's warbler on the Pine River KWMA, and on the Forest. It would implement the direction for Kirtland's warbler recovery described in the Forests' Plan, the Strategy for Kirtland's Warbler Habitat Management and the Kirtland's Warbler Recovery Plan.

Vegetative Composition Implementation of the Proposed Action Alternative would alter the existing vegetative community and composition at the project level, and would balance the age structure of Kirtland's warbler habitat in the Pine River KWMA over time.

By providing for the nesting requirements of Kirtland's warbler, the vegetative composition of the project area would change from understocked oak sprouts in the burn area to densely stocked jack pine stands. This alternative would set back succession on approximately 260 acres of regenerating oak.

The resulting block of KW habitat would be even-aged stands. The effect of this action would meet the specialized requirements of Kirtland's warbler and provide a slightly more homogenized vegetative type and age class distribution. This action would have the indirect beneficial effect of maintaining the species richness and evenness of the project area.

Site prep activities would have direct effects on wildlife. These effects would be temporary in nature and include harassment, displacement and limited mortality. Due to the temporary nature of these disturbances and the

resilience of populations to this type of disturbance, direct effects would be minimal and would not affect the viability of any of the species present.

Indirect effects to wildlife may occur depending on the species. As habitat was changed from oak sprout and open area to densely forested jack pine, the suitability of that habitat would go up or down, depending on the species. For example, Eastern bluebirds would benefit from the longer duration of open condition of the habitat. The creation of the early successional habitat for the Kirtland's warbler would benefit openland species such as upland sandpiper, Lincoln's sparrow, bluebird, and Nashville warbler.

Site preparation can also have an indirect effect on wildlife by impacts on habitat. Roller chopping would reduce the height of woody debris as cover, create some seed beds, and stimulate plant species such as blueberry. These activities would have both negative and positive effects on wildlife habitat.

The proposed action is expected to maintain or increase the biodiversity of the project area by enhancing or increasing the varied habitats which occur there.

Structural Diversity If Alternative 2 were implemented, the existing vegetative types would remain in the project area however the age classes and proportions would change. Short rotation conifer would become the dominant species in the project area, and jack pine would all be one age class (0-4 years). There would be a total loss of horizontal and vertical structural diversity for the first several years after implementation as stands are treated by site prep and the woody regeneration is removed. Ground nesting birds would have opportunities to nest in the project area after treatment for the first two years until herbaceous cover begins to fill in and then jack pine grows to four to six feet tall. For approximately seven years after planting, species such as upland sandpiper, vesper sparrow, native warm season grasses and would have temporary habitat in within the project area. These species would likely persist until the jack pine grows large enough to crowd them out.

It is expected that some snags would be blown over by the wind or knocked over as a result of site preparation and planting. Existing snags that fall would provide downed woody debris for amphibians, reptiles, rodents and snowshoe hares. The effect would be maintenance or increased coarse woody debris which would benefit wildlife species such as rodents, insects, and reptiles.

Fragmentation Creation of Kirtland's warbler habitat, through planting is considered the most dependable way to achieve the desired densities of regenerating jack pine on the Huron National Forest. Since the wildfire set back the project already, proposed treatments would have no effect.

Fragmentation of jack pine leads to potential future parasitism of Kirtland's warbler nests by brown-headed cowbirds, which seriously threatens the recovery of this species. The Fish and Wildlife Service traps cowbirds in occupied habitat to provide a measure of protection to Kirtland's warblers and associated bird species. The Exhaust Fire KW project area would receive interim protection from cowbirds from the trapping that occurs at the Dinosaur Valley KW block which lies immediately adjacent to the north, well within the demonstrated coverage area of these traps. This trapping effort is paramount since without this protection, the ability of Kirtland's warblers to reproduce in the project area and the effectiveness of this project would be jeopardized.

Cumulative Effects **[Wildlife]**

The Pine River KWMA is approximately 20,542 acres. The Forests' Plan, through the KW Strategy, establishes that management of KWMAs will strive to create 15-25 percent of each KWMA into suitable habitat, each decade. The No Action alternative, by deferring management, would result in a larger temporal gap between suitably aged stands and would therefore cause an even larger deficit in the amount of habitat for Kirtland's warbler recovery. The result of implementation of Alternative 1 is a cumulative adverse affect on habitat availability in the Pine River KWMA.

Implementation of Alternative 2 would begin to move the Pine River KWMA closer to the Forests' Plan objective. When proposed treatments are combined cumulatively with past KW habitat creation (Table 3), together they would create habitat on approximately 18% of the Pine River KWMA. These projects would have a cumulatively beneficial effect on Kirtland's warblers by creating some suitable habitat.

Table 3; Pine River KWMA Habitat Management Schedule, 1990-2011 and 2002-2013

Pine River KWMA Habitat Management Schedule				
KW Block	**Year Sold**	**Year Planted**	**Years until Suitable for KW**	**Total Acres**
Past Management 1994-2009 (18% of KWMA)				
Triangle	1996	2001	Currently Suitable	199
Queen's Corner	1999	2003-2004	Currently Suitable	246
Daylight	1996	2002	Currently Suitable	271
Chambers West	1994	2002	Currently Suitable	236
Conehead	2002	2004	Currently Suitable	275
Rusty Raptor	1997	2002	Currently Suitable	271
Cookie Crumb	1999	2003	Currently Suitable	83
Vandercookie	1998	2003	Currently Suitable	269
Ant Hill	1999	2004	Currently Suitable	351
Kobs	1999	2005	Project Area	336
Seven Channels	2003	2007	Currently Suitable	297
Kokosing	2004	Not planted	Not Planted	0
Bugs N Bears	2007	2008	1-2 years	103
Postal Britt	2004	2008	1-2 years	366
Red Trout	2005	2009	3-4 years	370
Future Management 2007-2018 (12% of KWMA)				
King WUI	2007	2010	4-5 years	369
Kobs	2010 (wildfire)	2011	6-7 years	341
Kings Corner	2010 (hydroaxe)	2012	6-7 years	270
Charlie Horse	2009	2012	6-7 years	369
Golden Gopher	2007	2013	8-9 years	369
Deer Run	2012	2015	9-10 years	432
Snowbird	2014	2018	12-13 years	303

Endangered, Threatened, and Regional Forester's Sensitive Species

A list of Federally endangered and threatened wildlife species and Region 9 Forester's sensitive wildlife species (RFSS) considered and possible effects to those species as a result of implementation of Alternatives 1 or 2 is discussed in the Wildlife Biological Evaluation (BE) for Exhaust Fire KW Project Area (Wildlife BE- project file). The Wildlife BE determined that Kirtland's warbler was the only federally listed species with breeding habitat in or near the project area. Project design criteria are established to prevent or minimize disturbance to Kirtland's warbler. Since the proposed action would create approximately 341 acres of suitable nesting habitat there would be beneficial indirect effects on the Kirtland's warbler. **The Wildlife Biological Evaluation (BE) determined that the Proposed Alternative would have no adverse direct effects on Kirtland's warblers, and indirect effects would be beneficial, over the long term. Treating the 76 acres of occupiable habitat is both insignificant and discountable due to its small size 1.32%, compared to the availability of occupiable habitat in the Pine River KWMA sub-population. Therefore, a determination of may affect (beneficial), not likely to adversely affect, was made.**

The BE also describes the impacts of the alternatives on RFSS. The BE disclosed that red-headed woodpecker is the only RFSS wildlife species known to occur in the project area. There are no known occurrences of other RFSS wildlife species within the project area, although black-backed woodpecker my have potential to occur since they are drawn to large wildfire areas. Effects determinations for red-headed woodpecker would also apply to black-backed woodpecker. The BE described how the No Action alternative would maintain the project area in a marginal habitat condition over the next decade. In contrast, the Proposed Action Alternative would have temporary beneficial impacts by maintaining open habitat conditions in the short term, but that habitat suitability would diminish over the long term as the suitability of habitat improves for Kirtland's warbler. **The Wildlife BE determined that the Proposed Alternative may impact red-headed woodpecker (habitat), but will not likely contribute to a trend towards Federal listing or cause a loss of viability to the population or species, and would have no impact on any other RFSS species.**

Among the 60 species of plants that are RFSS on the Huron-Manistee National Forest, none were found in the NRIS database. No plant surveys are on record for the project area. Because all of the area is on xeric excessively

drained sands (Grayling and Graycalm series), the potential natural vegetation on these sites is jack pine barrens. Potentially suitable habitat was thereby found for the following RFSS of barrens ecosystems*: Arabis missouriensis, Cirsium hillii, Prunus alleghaniensis,* and *Astragalus canadensis*. Among these species, only *Cirsium hillii* and *Prunus alleghaniensis* are reasonably likely to occur and will be assumed present. **Therefore the Botanical BE determined that Alternative 1 (No Action) would have beneficial impacts on *Cirsium hillii* and *Prunus alleghaniensis*, because their populations would likely expand into the recently burned site and that Alternative 2 (Proposed Action) May impact individual *Cirsium hillii* and *Prunus alleghaniensis,* but is not likely to cause a trend towards federal listing or a loss of viability, because relatively few individuals would be impacted and these species are otherwise locally abundant elsewhere across the district.**

Management Indicator Species
Introduction

Since the Forest Service's evolution from single-species management to ecosystem management, wildlife biologists have utilized a more holistic approach when addressing the needs of wildlife species (Robertson, 1992, Marita, *et. al.,* 1992). Although each wildlife species has individual habitat requirements, the sheer number (409 vertebrate species alone), renders single-species management unfeasible. Similar needs among wildlife species allows a general grouping of animals associated with common habitat types. Furthermore, the Huron-Manistee National Forests have selected six Management Indicator Species (four wildlife species) due to "their emphasis in planning, and which are monitored during forest plan implementation in order to assess the effects of management activities on their populations and the populations of other species with similar habitat needs which they may represent" (Forest Service Manual 2620.5, Washington Office Amendment 2600-91-5). The analysis of potential effects of the proposed management activities on MIS Species would result in an analysis for wildlife species with similar essential habitat requirements. Further discussion on the status of MIS is documented in the Huron-Manistee National Forests Monitoring and Evaluation Reports (1999-2009), and FEIS, (2006) which are incorporated here by reference.

Table 4; Management Indicator Species and Associated Habitat Descriptions

Indicator Species	Principal Habitat Characteristics on the Huron-Manistee National Forests	Existing Condition Within the Project Area
Bald Eagle *Haliaeetus leucocephalus*	Associated with mature timber adjacent to large lakes and rivers.	No habitat available.
Karner Blue Butterfly *Lycaeides melissa samuel*	Oak savanna and openings with lupine on the Baldwin White Cloud Districts of the Manistee National Forest	No habitat available.
Kirtland's warbler *Dendroica kirtlandii*	Younger aged deciduous stands (seedling/sapling size) of jack pine.	Partial suitable (76 acres of 341)
Ruffed Grouse *Bonasa umbellus*	Aspen and aspen-alder mixes, 5-25 years old, with large crowned male aspen clones.	No habitat available.

Population trends for MIS are found in the annual HMNF Monitoring and Evaluation Reports, 1999-2009 and in the FEIS, (2006). This information is utilized to implement and adjust the Forest program.

Analysis of MIS species

Since there is no habitat available in the project area, implementation of the proposed action would have no effect on bald eagle. Karner blue butterfly does not occur on the Huron National Forest, so there would be no effect on this species as well. Effects to Kirtland's warbler were described previously. While some grouse may be found on the project area on a seasonal basis, grouse rely on several age classes of aspen in close proximity to each other to meet their yearly life requirements. Since there are no stands of aspen in the project area, there is no available habitat and there would be no effects to ruffed grouse.

Physical Factors

C. Soil and Water Resources

Analysis Bounds

There are no water resources close to or affected by project activities.

D. Air Quality

Affected Environment

The state of Michigan has been in attainment for PM_{10} since October 1996. However, a review of the state's $PM_{2.5}$ monitoring data indicates that, based on the years 2001-2003, six out of a total of 39 $PM_{2.5}$ monitors in the state measured a three-year average above the NAAQS of 15 $\mu g/m^3$ (micrograms/cubic meter). Thirteen other monitors met the standard but measured a three-year average value greater than 85% of the annual standard. Five of the six monitors with high values are located in the industrial area of Detroit, the sixth is just downwind from Toledo, Ohio. At all Michigan monitors, the 24-hour average $PM_{2.5}$ NAAQS of 65$\mu g/m^3$ is being met.

Direct, Indirect, and Cumulative Effects on Air Quality

Sensitive receptor sites are usually defined as locations where human populations tend to concentrate. These may be residential concentrations in the form of towns or cities, or locations where people tend to gather in groups such as parks and schools. Travel routes such as highways may be labeled as sensitive receptor sites. Particular areas along highways or other locations may be more prone to being declared sensitive receptor sites because of topographic and microclimate features.

No areas within the Pine River Kirtland's Warbler Management Area (KWMA) are recognized as non-attainment areas in Michigan. No direct, indirect, or cumulative effects are expected when the above parameters are employed.

E. Visual Quality

This analysis assesses the effects of the project on the scenic integrity within the analysis area. Scenic integrity is a key concept of the Scenery Management System, which is used to determine the relative value and importance of scenery in the National Forest System. The Scenery Management System is used in the context of ecosystem management to inventory and analyze scenery; assist in developing natural resource goals and objectives; monitor scenic integrity, and ensure that attractive landscapes are sustained for the future.

Scenic Integrity is an indication of the state of naturalness or, conversely, the state of disturbance created by human activities or alteration. It measures how closely the landscape approaches the character desired over the long term. It is stated in degrees of deviation from this desired character. Where the desired character is reflective of the existing character, then Scenic Integrity measures deviation from the existing condition. Landscape character with a high degree of scenic integrity has a sense of wholeness or being complete. In the Scenery Management System process, Scenic Integrity is managed in degrees ranging over five levels from Very High to Very Low.

Analysis Bounds

The cumulative effects analysis boundaries for visual quality effects will be the Pine River KWMA. This area is managed primarily for the Kirtland's warbler and incorporates large, temporary openings across the landscape. Visually, Kirtland's Warbler Management Areas are unique on and to the Forest.

Affected Environment

The analysis area landscape is characterized by a forested environment dominated by extensive jack pine and jack pine/oak stands with red pine plantations and fuelbreaks interspersed. Visual contrast is evident where 200 to 300 acre warbler treatment blocks have been regenerated and display a variety of age and size classes.

A naturally appearing landscape for the analysis area would include extensive jack pine stands of varying ages, interspersed with barrens, openings, and mixed red pine/jack pine/oak stands. These ecosystems were historically maintained by wildfires.

Direct and Indirect Effects of Alternative 1 **[Visual Quality]**

The Exhaust fire left 260 acres of burned jack pine in the Pine River KW block. Much of it still stands. Implementing the No Action alternative would result in minimal perceptible change in the landscape characteristic in the short term. Indirect effects would occur within the next several years when the burned jack pine fell leaving a more open

landscape view. At the same time, oak re-sprouts and patchy clumps of jack pine would regenerate. This natural regeneration would create some visual contrast. The No Action alternative would not create a new age class of jack pine which is the desired landscape character in Kirtland's warbler habitat.

Direct and Indirect Effects of Alternative 2 **[Visual Quality]**

Management activities in this alternative would result in a short term drop in the scenic integrity level, as a large open area would appear quickly to create Kirtland's warbler habitat. Once the forested habitat is established and the appearance is consistent with the desired condition, the integrity level would be higher than before the activities were implemented. After several years, young jack pine plantations would put on visible growth and eventually the open area caused by the fire would become less distinguishable, displaying a continuous wall of trees along travel corridors.

Cumulative Effects of Alternative 2 **[Visual Quality]**

Cumulatively, the Proposed Action along with past and scheduled activities would gradually produce the Scenic Integrity desired for the area as set forth in management direction in the Forests' Plan. These activities would slowly create the desired landscape character of maintaining age class diversity in predominantly jack pine ecosystems.

F. Heritage Resources

Analysis Bounds

Cumulative effects boundaries for heritage resources are the project area boundaries. Proposed ground disturbances would not affect cultural resources outside these boundaries.

Affected Environment

The area of potential effect for the Exhaust Fire KW Project is identified as approximately 341 acres of National Forest system lands on the Huron Shores Ranger District. Research indicates that this area was surveyed in 1999. The remainder of the project was surveyed in 2010. No historic properties were found.

Direct, Indirect, and Cumulative Effects [heritage]

There would be no direct, indirect or cumulative effects to heritage resources because none have been found in the project area. If during project implementation an identified historic sites was discovered, proposed project work should cease, design criteria dictates that a Forest Service Cultural Resource Specialist be contacted for consultation (refer to Project Design Criteria, Section 2.2 of this EA).

G. Transportation

Analysis Bounds

The analysis area boundaries will include the Exhaust Fire project area. This area covers approximately 341 acres.

Affected Environment

Roads within the analysis area are mostly unimproved, one and two-lane sand roads on relatively flat, sand soils. Bischoff Road, making up the eastern border and Kobs Road, making up the western border of the project area are sandy Forest Service roads. These roads connect the project area to Bissonette Road, the main paved road that leads to Oscoda. The Forest System roads are not maintained in the winter.

The Forests Plan provides direction (pp 11-29, Section 7700-1-A) to obliterate roads not needed for administration and public use. Over the past decade, roads not needed for management within Kirtland's warbler essential habitat have been obliterated to provide essential nesting habitat for Kirtland's warbler. The Forest Plan identifies unclassified and unneeded roads dissecting KW treatment blocks as priorities for decommissioning.

There are no unclassified roads or roads slated to be closed within the project area.

According to the Strategy for Kirtland's Warbler Habitat Management, equestrian and hiking trails will be relocated or buffered to prevent adverse effects to breeding Kirtland's warblers by trail users. Trails in existing and proposed additional essential habitat would be relocated to areas outside of essential habitat where possible. New trails would not be constructed in Kirtland's warbler essential habitat.

There are no existing or proposed trails within the project area. No relocation routes or trail building would occur within the Exhaust Fire KW Project area.

Direct and Indirect Effects of Alternative 1 **[Transportation]**

Alternative 1 represents no change to the current status of the transportation system within the analysis area. The existing classified road density would be maintained within the analysis area.

Direct and Indirect Effects of Alternative 2 **[Transportation]**

Equipment used for site prepping and planting of units would be accessed by existing roads. Driving surfaces of roads are satisfactory and no upgrades would be needed. Minor brushing may be necessary.

Open road densities within the project area would remain the same as they would in Alternative 1.

Cumulative Effects of Alternative 1 and Alternative 2 **[Transportation]**

Implementation of Alternative 1 or Alternative 2 would pose no cumulative effects to the transportation system in the analysis area.

H. Fire and Fuels

Table 5; Glossary: Abbreviations, Acronyms, and Terms

Biomass	The total mass of living matter within a given unit of environmental area.
Effective treatment	An activity resulting in a full benefit at year 1, then declining linearly over time until there are minimal benefits. Varies depending on activity.
Fire Behavior	The manner in which a fire reacts to the influences of fuel, weather, and topography.
Fire Interval	Time in years between two successive fires in a designated area; i.e. the interval between two successive fires (Dickman and Cleland, in press)
Fire Regimes	The general classification of the role fire would play across a landscape in the absence of modern human mechanical intervention, but including the influence of aboriginal burning.
Fire Rotation	Length of time necessary for an area equal to the entire area of interest (i.e. the study area) to burn (Dickman and Cleland, in press)
Fuel Break	A natural or manmade change in fuel characteristics which affects fire behavior so that fires burning into them may be more easily controlled.
FOFEM	First Order Fire Effects Modeling. A modeling program
Hazard (Fire)	Fuels and topography of an area.
Hazard Fuel Reduction	Any treatment of living or dead fuels that reduces the threat of ignition and spread of fire
Long term	Two to ten years following implementation.
Prescribed Fire	A management ignited fire for the purpose of forest management, often to remove heavy fuel buildup or simulate natural cycles of fire in an ecosystem.
Short term	One to two years following implementation.
Risk (Fire)	Those uses or human activities which have the potential to result in a wildland fire ignition.

Analysis Bounds

For the purposes of analyzing cumulative effects, the analysis area will be the Pine River Kirtland's warbler management Area (Pine River KWMA). The analysis area was chosen because; 1) it encompasses the project activities effecting fire and fuels, and 2) the proposed actions would have similar effects on the hazardous fuels and fire regimes as those of past, present and reasonably foreseeable future actions within the analysis boundaries.

The analysis would consider management actions and other factors, such as wildfire, on public and private lands within the analysis boundary that have reduced or are planned to reduce hazardous fuels for the past and future ten years. This time frame was chosen based on the effectiveness of hazard fuels reduction treatments. The long term duration of effectiveness for the project activities would be similar to historic timeframes, and mechanical treatment remaining effective for ten years due to reduced over-story vegetation. A wildfire event in untreated fuels would result in a long-term effect for the project area for the same ten-year duration as the thinning or mechanical treatment projects. This assumption is based on past wildfire experience and stand replacement fire intensities.

Past
The removal of overstory vegetation through timber harvest has been a common practice in the analysis area. The majority of the area is considered essential habitat for the Kirtland's warbler and is managed to provide young jack pine in an age class of 5-20 years. The process of clear-cutting and reforestation typically occurs over a five to ten-year period. In addition, red pine stands which have been classified as essential habitat have been clearcut and reforested with jack pine. Red pine has also been managed in the analysis area by thinning immature stands. Timber related activities that have occurred in the past ten years are shown in Table 3.

Present

Currently there are two active timber sales within the cumulative effects boundary. Their names and the acres being treated are shown in Table 3.

Future

Future projects and associated treatments are shown in Table 3.

Affected Environment

Approximately 30 percent of the Pine River KWMA is comprised of short-rotation conifer types. About 26 percent are short-rotation oak forest types. Both of these vegetation classes are consist of early successional forest types that were historically sustained by frequent wildfires. The remainder of the area is in openings (1%), and long rotation conifers (43%).

Long-rotation forest types such as red pine and white pine account for approximately 43 percent of the Pine River KWMA. Altogether, approximately 24 percent of the project area is in coniferous forest types. A risk assessment for the Huron National Forest clearly identifies the project area as having high potential for extreme and high-intensity wildland fire (Appendix A.3).

The coniferous forest types occur on dry, sandy soils and pose a high wildfire hazard. The project area is within Fire Regime (FR) 1 (Appendix A.4). Historically, these ecosystems experienced frequent, large catastrophic stand-replacing fires. Average fire return intervals, reported in the literature ranged from 26 to 69 years, fire rotations from 50 to 179 years. Theses ecosystems typically occur within very dry, flat outwash plains underlain by coarse-textured sandy soils. The dominant forest types were short-lived jack pine and mixed pine forests (Cleland, et. al., 2004).

The project area occurs on Land Type Association (LTA) 1 (Appendix A.5). The forests of LTA 1 consist primarily of species adapted to xeric conditions and frequent fire, including jack and red pines, black, and white oaks. Before settlement, the flat sandy outwash plains were prone to fire and dominated by jack and red pines. In an average year the expected fire hazard is very high with crown fire expected.

Direct and Indirect Effects of Alternative 1 **[Fire and Fuels]**

The proposed actions would be deferred and no fuel reduction would occur. The short-term effect of no action would be no immediate decrease in fuel loading. There would be no change in fire hazard or occurrence from the

present. Wildfire risk would continue to be high to extreme. In the long term, catastrophic wildfire potential would continue to increase as jack pine continued to mature and crown canopies close. Fuel loading would also continue to increase in the burn area. In the event of catastrophic wildfire, containment would likely be dependent of a change in fuel type and/or weather conditions.

Direct and Indirect Effects of Alternative 2 **[Fire and Fuels]**

Alternative 2 would reduce hazardous fuels through proposed treatment of submerchantable trees and residual jack pine in the burn area, by mechanical means, and then planting to KW densities. The proposed action would produce a shift in the fuels in the project area. In the short term, fuel loading would be reduced within the project area. In the long term, as these young jack pine plantations mature, fuels and fire hazard within these stands would increase as a nearly continuous overstory of flammable foliage develops.

In the short term, rollerchopping the burn area would compact the fuels and enhance decomposition although the fuel loading would remain the same. In the long-term, fuel loading from residual slash would decrease as the slash decomposed. However, over the long-term, fuel loading would increase due to the growth of trees planted to reforest the site.

Mechanical treatment of the standing trees would result in short-term and long-term effects similar to those discussed for roller chopping or other mechanical site prep.

Cumulative Effects of Alternative 2 **[Fire and Fuels]**

Cumulatively, by continuing to plant jack pine at densities desired for Kirtland's warbler habitat, a consistent age-class distribution within Pine River KWMA essential habitat would ideally be maintained. This would maintain the mix of fuels within the analysis area over the long term. Location of those fuels and fuel breaks (temporary openings) would shift over time.

Alternative 2 would have a beneficial cumulative effect on hazardous fuels reduction. The short term effect would be the removal and consumption of biomass and the immediate reduction of hazardous fuels. Similar activities have taken place over the past 10 years, are currently in progress or are planned to take place in the next several years. They are reflected in Table 3. Site preparation activities, and prescribed burning would provide an overall positive contribution within the analysis boundary by reducing fuels.

Temporary openings, including KW habitat to be planted in the foreseeable future (fiiscal years 2011, for the proposed project, and additional acres from previous projects such as the Postal Britt and Charlie Horse KW Project, would increase in the analysis area. Ideally, the shift in temporary openings would be maintained as KW habitat continues to be established, thus maintaining a fuel barrier component within the KWMA essential habitat. Should a catastrophic wildfire occur, it is likely that only major changes in fuel type (forest type) would allow for containment.

The effectiveness of all activities, however, decreases as biomass increases. The treatments would become less effective over time, with mechanical treatments declining over a ten-year period and prescribed fire declining over seven years.

Social and Economic Factors

I. Recreation and Social Values

Opportunities for developed and dispersed recreational experiences on the forest are classified and defined by the *Recreation Opportunity Spectrum* [ROS (Forest Plan EIS, Chapter III, pages 271-275)]. The Exhaust Fire KW Project falls within the Roaded Natural ROS Class. Forest Plan direction for management of the analysis area is to provide a mixture of recreational opportunities to meet identified needs and demands, and within the KWMA, dispersed recreational opportunities consistent with essential habitat management for Kirtland's warbler.

Analysis Bounds

For the purpose of analyzing effects of the alternatives on the recreation resources, the analysis area will be the Kobs KW Block. This bounds was chosen because the proposed activities are only proposing to site prep and regenerate habitat that was burned within the Block. Effects to recreation resources would be isolated to just that Block.

Affected Environment

Kirtland's Warbler Management Blocks present a unique recreation situation to the Forests' management. Recreation opportunities within Kirtland's warbler essential habitat are somewhat restricted and mainly seasonal, as *occupied* habitat is closed to public entry during the breeding and nesting season. Primary roads remain open through the nesting and breeding season, and birders frequent the area for a chance to hear and view the endangered Kirtland's warbler.

Kirtland's warbler essential habitat is commonly used for recreation activities such as hunting for white-tailed deer, snowshoe hares, and to a lesser extent for bear, bobcat, wild turkey, ruffed grouse, and squirrels. Other uses are guided Kirtland's warbler tours, blueberry picking, trapping, and general wildlife viewing. These uses are generally compatible with management for Kirtland's warbler habitat and will be encouraged on these lands with some restrictions. Other recreational uses subject to greater restrictions include off-road vehicle (ORV) use, horse back riding, and hiking. Since Kirtland's warbler nesting habitat is the highest priority for these lands, measures must be taken to protect the warbler and its habitat from potentially harmful agents, events or human recreation.

Recreation use in the Kobs KW Block is considered low throughout most of the year. The area provides opportunities for dispersed camping, hunting, wildlife viewing, and berry picking. The area receives slightly higher use during the spring turkey hunting season, the summer blueberry picking season, and the fall deer hunting season.

There are no developed campgrounds within the Kobs KW Block. Dispersed camping may exist in the area primarily during hunting season, but is not a high use. Illegal ATV use in the area is low, being higher in areas around private property and areas with greater terrain.

Direct and Indirect Effects of Alternative 1 **[Recreation and Social Values]**

The No Action Alternative would have little effect on the recreational setting or uses, or opportunities available in the short term. There would be no interruption to existing activities, current access levels would be unchanged, and results of recreational pursuits would remain fairly constant for several years.

Nature viewing, and hunting and berry picking success, dependent on natural processes or vegetation management, could be affected as a consequence of no management action. Numbers and types of wildlife species traditionally viewed or hunted, and composition of understory plant species (such as blueberries) would decrease as age class diversity declined.

Opportunities for other recreational uses would remain relatively unchanged over the long term. Uses not necessarily connected to vegetation management, such as camping, would not be affected.

Direct and Indirect Effects of Alternative 2 **[Recreation and Social Values]**

There would be little direct change in recreation opportunities or experiences as a result of implementing the proposed actions. The proposed action would maintain the present Recreation Opportunity Spectrum within the analysis area. Proposed activities are consistent with past management and compatible with the current recreation uses and character of the area.

Site prepping and planting may have the potential to temporarily reduce the feeling of remoteness in the area. Hunters and berry-pickers could be displaced from areas traditionally used while planting takes place, and during the period of Kirtland's warbler occupation (primarily jack pine stands between the ages of five and fifteen). This effect could last up to twelve to sixteen years for the Kobs Block. During this time, the adjacent unburned jack pine stands within the block would be open to hunting and blueberry harvest. Planted stands would remain open in appearance for several years before newly established trees grow to an enclosed forested condition.

Due to the disturbance caused by site prep, blueberry production would decrease in the short term. Blueberries respond well to disturbance however and within the next several years plants would produce more.

Within several years, reforested jack pine stands would attract breeding and nesting Kirtland's warblers, thus increasing opportunities for birders to view the endangered warbler.

Cumulative Effects of Alternative 2 **[Recreation and Social Values]**

Future treatment of KW blocks adjacent to the Kobs Block in the KWMA would continue to change the vegetative structure and age-class distribution around the analysis area. Large clearcuts and jack pine stands have less recreational value for camping and hunting, and as occupied Kirtland's warbler habitat is closed to the public during the nesting season, some recreation users from the area would be displaced. This number would not be considerable because recreation use is already low throughout the analysis area. Bird watching would likely become more prevalent in the analysis area as a more stable population of Kirtland's warblers would inhabit the area with continued habitat development.

The pursuit of recreational experiences is expected to continue to expand nationwide. Under Alternative 2, no adverse cumulative effects are expected from past, proposed, or reasonably foreseeable future management activities, as the existing array of recreation opportunities may move around within the analysis area but would not change. Recreation users would continue to find suitable opportunities to meet expectations.

J. Civil Rights Impact Analysis and Environmental Justice

Analysis Bounds

The bounds of analysis for determining effects on civil rights and environmental justice is Iosco County, Michigan.

Affected Environment

The 2000 U.S. Census shows 12.7% of the population of Iosco County being below the poverty level, while that of the State of Michigan is 10.5%.

Based on the 2000 census results, the minority population in Iosco County is 3.7%, while that of the state of Michigan is 21.4%.

Direct, Indirect, and Cumulative Effects **[Civil Rights and Environmental Justice]**

Neither alternative is expected to disproportionately impact human populations. There are no human health or safety factors associated with, or physical or biological factors influenced by the alternatives that would affect low-income or minority populations in or around the project area. There are also no biological or physical factors influenced by the alternatives that would disproportionately affect low-income or minority populations in or around the project area. The laws, rules, and regulations governing nondiscrimination conduct in government employers and by government contractors and subcontractors would be employed in all actions associated with the alternatives. No environmental justice issues were raised during scoping of the proposed action. Neither of the alternatives would disproportionately affect low-income populations.

Based on 2000 U.S. Census demographic information, the percent of low-income and minority population in Iosco County is less than twice that of the state of Michigan. This demographic indicates Iosco County does not qualify as an environmental justice community.

3.2 Irreversible and Irretrievable Commitment of Resources

Irreversible commitments of resources are decisions to use, modify or otherwise affect nonrenewable resources such as minerals and cultural resources, or resources that have deteriorated to the point that renewal can occur only over a long period of time or at a great expense**.** Neither alternative for the proposed Exhaust Fire KW project would result in irreversible commitments.

Irretrievable commitments represent opportunities forgone for the period of the proposed actions, during which other resource utilization cannot be realized. These decisions are reversible, but the utilization opportunities are irretrievable. Under multiple-use management, some irretrievable commitments of resources are unavoidable, due to the mutually exclusive relationship between some resources.

Chapter 4: List of Preparers

4.1 Interdisciplinary Team Members

Paul Thompson – Team Leader, District Wildlife Biologist
Kari Vanderheuel – NEPA/Recreation Planner
Greg Schmidt – Huron Zone Botanist
Kristy O'Neil – Huron Zone Archeological Assistant
Mara Jones-Branch – Forester
Gordon Haase – Natural Resource Manager
Liz McNichols – GIS Specialist
Susan Kocis – District Ranger/Responsible Official

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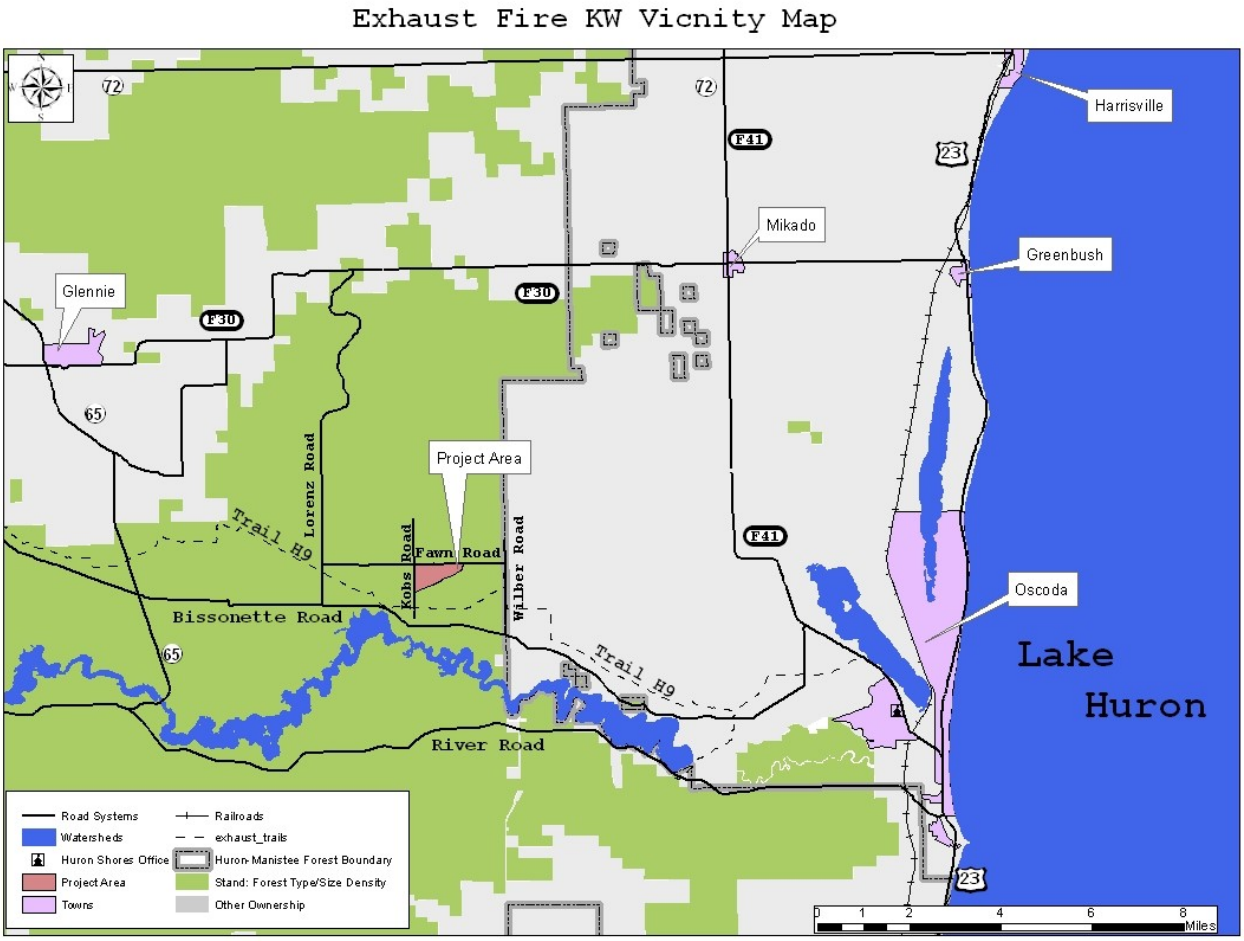
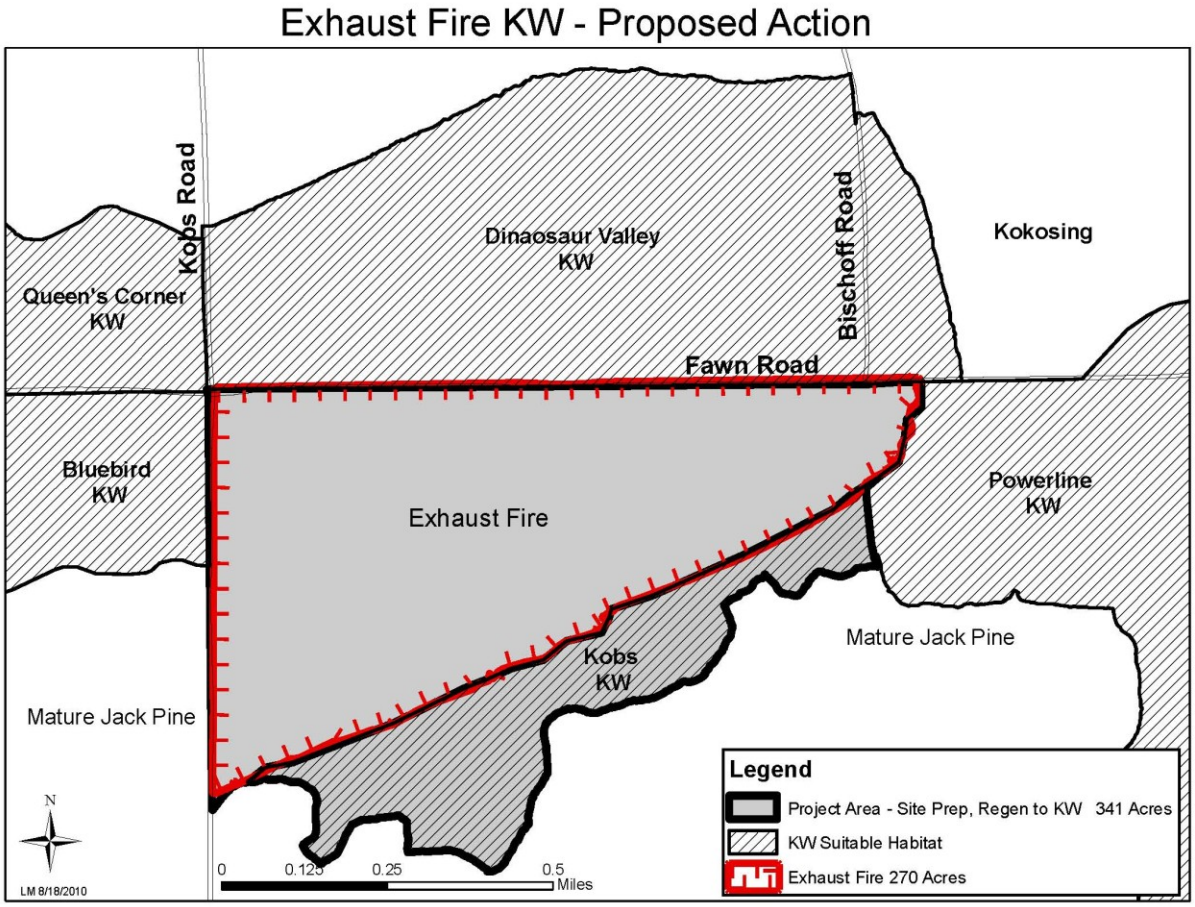
Appendices

Appendix	A.1	Exhaust Fire KW Vicinity Map
	A.2	Exhaust Fire KW Proposed Action Map

Appendix A.1; Exhaust Fire KW Vicinity Map



Appendix A.2; Exhaust Fire KW Project Map