

# Chapter 3: Affected Environment and Environmental Consequences

## Introduction

This chapter describes general information, location, management direction, and existing conditions for the project area. It also describes the environmental impacts of the alternatives described in Chapter 2. Information in this chapter is based on reports written by various Resource Specialists (Appendix E – List of Preparers). These more detailed reports are kept in the project file located at the Swan Lake Ranger District Office. Analysis in the chapter is the basis for the summary of alternative comparisons given in Chapter 2.

The affected environment and environmental consequences are combined into one chapter for continuity and ease of reading. After providing the location and the Forest Plan management direction, this chapter discusses specific resources and issues.

## Project Area

The Hemlock Elk Fuels Reduction and Forest Health Project Area is located in the Swan Valley near Condon, Montana. The project area is bounded by Montana Highway 83 on the east, the South Fork of Cold Creek on the north, Kraft Creek on the south, and the ridges of the Mission Mountains to the west. Elevation within the project area ranges from 3,800 feet along the Swan River to nearly 8,600 feet on the Mission Mountains Divide (Vicinity Map 1-1).

## Definitions

The following definitions should help the reader understand terms describing the analysis areas used to disclose the environmental consequences of implementing the alternatives.

### Project Area

As shown on Vicinity Map 1-1, the project area includes approximately 36,653 acres. National Forest System lands occupy 26,915 acres of the project area (73 percent); PCTC owns about 5,989 acres (16 percent); and other private landowners own about 3,749 acres (10 percent).

### Analysis Area

The area used for determining direct, indirect, and cumulative effects for the natural resources considered in this analysis. Note, the spatial and temporal bounds of the analysis (affected) area used for the effects analysis have been identified and described for each natural resource area included in this analysis and may vary from resource area to resource area.

### Grizzly Bear Subunit

A grizzly bear subunit is an area approximately the size of an average annual female home range (about 50 square miles), generally from ridge top to valley bottom, and including all seasonal habitats.

The Hemlock Elk Project Area falls within Hemlock Elk Grizzly Bear Subunit. The proposed management actions included in all action alternatives comply with the Swan Valley Grizzly Bear Conservation Agreement (SVGBCA) (Project File Exhibit Q-12).

## Affected Environment Analysis

The resource information provided in the Affected Environment narratives includes the effects of past actions, assessing them as part of the existing condition of the landscape. For instance, consider a hypothetical example of a past timber sale in 1979 harvesting 150 acres of forest and constructing 2 miles of new road within the Hemlock Elk Project Area. The effects of the harvest and road construction, as well as the vegetation re-growth and roadbed stabilization, occurring over the past 29 years would be accounted for in several assessments of the affected environment based on the specific resource being analyzed. Following are a few illustrations of the consideration of past actions in the affected environment with a scenario of this type:

- The change in forest structure from this past regeneration harvest would be displayed in the existing successional stage distribution disclosure in the Vegetation Section. Field examinations indicate this 150-acre harvest area supports a fully-stocked stand of 20-foot trees and has progressed into a mid-seral successional stage over the past 29 years. This information would be included in the acreage of mid-seral successional classification and used in disclosure of existing vegetation and wildlife habitat conditions.
- The existing level of past regeneration harvest in the project area would include the 150 acres from this activity.
- Stream channel surveys assessing stream conditions in the project area would reflect any remaining physical and biological effects of the past timber sale and road construction. These field classifications of existing conditions of specific streams would be disclosed in the Affected Environment Section.
- The present contribution of sediment and increased stream flow from the 2 miles of road construction would also be accounted for in the calculation of existing watershed conditions as specific road segments and their construction dates are entered into the WATSED models. Likewise, any residual effects of the 150-acre harvest unit would be reflected in the existing condition model outputs based on vegetative recovery validated through field and aerial photo reconnaissance.
- Field examinations of road conditions would provide additional data on residual contributions of sediment from the 2 miles of road. These effects would be incorporated into existing road condition disclosures and provide a basis for proposed BMP projects for improved drainage, if needed.

Specific past actions considered in the Hemlock Elk Project Environmental Assessment are summarized in Table 3-1 below. Project File Section R provides detailed information for these actions. A list of past actions is not necessarily exhaustive, as records may not exist for all past activities (by project). This is particularly true for those actions that predate the passage of the NEPA in 1969. Nevertheless, the effects of such past actions are fully accounted for in the assessment of existing condition as the current condition assessment necessarily reflects the impact of such actions (to the extent they are still affecting the particular resource considered).

## Environmental Consequences

The Environmental Consequences Section details the environmental effects that would occur for each alternative. It forms the scientific and analytical basis for the alternative comparisons presented at the end of Chapter 2. Information used to assess effects is based on the consideration of the best available sciences. The effects of Alternative A (No Action Alternative) form a baseline against which action alternatives are evaluated. Each narrative begins with a brief explanation of how effects were analyzed and the models used for each resource. When the effects or impacts are associated with an

issue, as described in Chapter 2, their relevance and connectedness with the issue are discussed and play an important role in the evaluation of alternatives.

Environmental effects can be direct, indirect, or cumulative. They can be long or short duration. Effects can be quantitative or qualitative, adverse or beneficial, actual or potential. It is important to consider timing and location of effects. Direct effects are those caused by the action and occur at the same time and place. Indirect effects are those caused by the action and are later in time or further removed in distance, but are still reasonably foreseeable (40 CFR 1508.8). In most cases, direct and indirect effects are discussed together. Cumulative effects are those that result from the incremental impact of the action when added to other past, present, and reasonable foreseeable future actions (40 CFR 1508.7). Therefore, the discussion of effects first considers the direct and indirect effects of each alternative and does not consider cumulative effects unless direct and indirect effects exist.

As the effects on a resource for each alternative are read, the supplemental maps should be referred to for the location of activities and area of analysis.

Discussions at the end of each resource section include a description of the Regulatory Framework associated with that resource. Environmental laws such as the NFMA, Endangered Species Act (ESA), Clean Water Act, and Clean Air Act provide the direction to the Forest Service for management of forest resources. These laws are interpreted and defined through the Code of Federal Regulations (CFRs), Administrative Rules of Montana (ARMs), Land and Resource Management Plan (Forest Plan) direction, Forest Service Manual (FSM) direction, and Forest Service policy. The Regulatory Framework associated with each resource is helpful in relating National and Forest direction to resource analysis procedures.

The cumulative effects analysis includes the additive effect of the action being considered when added to the effects of past, present, and reasonably foreseeable future actions. As past actions are already included in the affected environment, cumulative effects analysis builds upon this existing condition assessment by considering the incremental addition of direct and indirect effects of proposed, as well as present and reasonably foreseeable actions. While impacts can be differentiated by direct, indirect, and cumulative, the concept of cumulative impacts takes into account all disturbances since cumulative impacts result in the compounding of the effects of all actions over time.

Detailed descriptions of foreseeable actions and Cumulative Effects Worksheets by natural resource are filed in the Hemlock Elk Project File. The cumulative effects analysis for each resource area considered only those actions that would have measurable effects. Reasons as to why other actions had no effects are documented in the project file and are not elaborated on further in this chapter.

Table 3-1 provides a summary of the actions considered in the cumulative effects analysis for the Hemlock Elk Project. Additional information such as maps and specific details such as the timing, type, location, and scale of these past, present, and future actions is also included in the project file. The effects of these activities are discussed by resource in Chapter 3 - Affected Environment and Environmental Consequences.

### **Past Actions**

Past actions are management activities (timber harvest and prescribed burning) and events (wildfire) that occurred in the analysis area. The effects of these activities and events provide baseline conditions for the affected environment resources existing in the analysis area, which are described in Chapter 3 of this document. Additional information is contained in the project file for each of the resources. Records of past activities and events for the analysis area were examined from years 1950 to 2008. Activities recorded during this time are listed in Table 3-1.

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**TABLE 3-1.  
PAST ACTIONS CONSIDERED IN THE CUMULATIVE EFFECTS ANALYSIS**

Action	Description	Unit of Measure	
<b>Forest Service Lands</b>			
Fuels Management, Wildfire Suppression, and Vegetation Management Activities within the Hemlock Elk Project Area	Wildfire (1956-2007)	Crazy Horse Fire 8,041 acres	
	Vegetation Management (1956-2007)	Regeneration Harvest 1989 acres	Intermediate Harvest 739 acres
	Timber Stand Improvement Treatments (1966-1996)	Pre-Commercial Thinning 1037 acres	
	Site Preparation	Underburning – 253 acres Mechanical Site Prep – 1056 acres Slashing – 486 acres	
Road Management/Maintenance within the Hemlock Elk Project Area	Road Management	30.5 Miles of Forest Roads 3.8 miles – Open 2.6 Miles Seasonally Open 20.6 Miles Closed 3.6 Miles Impassible 4.3 Miles Decommissioned	
Road Management/Maintenance outside the Hemlock Elk Project Area	BMP improvements in Cold Creek Drainage on Roads #9599 and 9568 (2006)	4.5 miles	
Special Use Permits within the Hemlock Elk Project Area	Section 15 T21N, R17W – Missoula County FRTA Road Easement; Sections 25 and 36 T21N, R17W - Montanan Department of Transportation Easements; Sections 14, 25, and 36 T21N, R17W - Power line to Missoula Electric Cooperative; Sections 14, 15, 16, 25, and 36 T21N, F17W - Fiber Optic Cable and Power Line; Sections 6, 7, and 28 T20N, R17W - FRTA Road Easements to Burlington Northern & Santa Fe Railroad; Section 32 T20N, R17W - FRTA Road Easement to PCTC		
Noxious Weed Management within the Hemlock Elk Project Area	Noxious Weed Spraying		
FS Land Acquisition	FS Acquisition of PCTC Lands within the Hemlock Elk Project Area (1995 – 2008)	640 acres; T20N, R17W Section 19 (1997) 640 acres; T20N, R18W Section 13 (1997) 640 acres; T21N, R17W Section 15 (2003) 650 acres; T20N, R17W Section 29 (2004)	
	FS Acquisition of PCTC Lands within the Swan Valley (1995-2008)	741 acres; T19N, R17 Sections 11 and 22 (1998) 1803 acres; T19N, R17W Sections 26, 27, and 35 (1998) 480 acres; T19N, R16 Section 3 (2001) 640 acres; T22N, R17W Section 17 (2001) 600 acres; T19N, R16W Section 9 (2003) 307 acres; T21N, R17W Section 3 (2003) 640 acres; T21N, R17W Section 9 (2003) 110 acres; T22N, R17W Section 3 (2003) 600 acres; T19N, R16W Section 19 (2003) 553 acres; T19N, R16W Section 17 (2004)	

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**TABLE 3-1.  
PAST ACTIONS CONSIDERED IN THE CUMULATIVE EFFECTS ANALYSIS**

Action	Description	Unit of Measure
		102 acres; T19N, R16W Section 7 (2005) 220 acres; T19N, R17W Section 1 (2006) 640 acres; T19N, R17W Section 25 (2006) 160 acres; T19N, R17W Section 26 (2006)
<b>Private and Industrial lands</b>		
PCTC Fuels Management, Wildfire Suppression, and Vegetation Management Activities within the Hemlock Elk Project Area	Vegetation Management (1974-2004)	Regeneration Harvest 6341 acres
Road Management, Maintenance, and Closures within the Hemlock Elk Project Area	PCTC Roads	55.6 miles
	Private Roads	7.4 miles
	Missoula County Roads	2.3 miles
PCTC Land Sales	Sale of PCTC Lands to <b>Private</b> Ownership within the Hemlock Elk Project Area (1995 – 2008)	640 acres; T20N, R17W Section 15 (2006) 638 acres; T20N, R17W Section 11 (2007)
	PCTC Lands Sales within the Swan Valley (1995-2007)	- 44 parcels totaling 15,705 acres - 11,489 acres sold to conservation buyers - 4,216 acres sold to private parties - 549 acres sold to private parties with conservation easements
Private Land Development within the Hemlock Elk Project Area	Missoula County	No subdivision applications in Missoula County portion of the project area.
<b>Montana State and Counties (Missoula &amp; Lake)</b>		
State of Montana Timber Harvest	Vegetation Management within the Hemlock Elk Project Area	No Montana State lands lie within the Project Area.
<b>All Forest Lands (NFS, Public &amp; Timber Industry) Actions</b>		
Dispersed Recreation	The area offers a variety of motorized and non-motorized year-round recreation opportunities including, hiking, cross-country skiing, mountain biking, hunting, fishing, gathering forest products, driving for pleasure, and snowmobiling. Hemlock Peak Trail #515, Hemlock Lake Trail #607, and Elk Creek Trail #301 are Forest Development Trails located within the project area.	X

### Present and Reasonably Foreseeable Actions

Present and Reasonably Foreseeable Actions are management activities or projects planned by the Forest Service, other government agencies, or private landowners in or near the analysis area, which could occur regardless of which alternative is selected for implementation. Present and Reasonably Foreseeable Actions are activities or protects that are ongoing or will be implemented within the next 10 years, including those that would recur annually.

Present and Reasonably Foreseeable Actions are displayed in Table 3-2.

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**TABLE 3-2.  
PRESENT AND REASONABLY FORESEEABLE ACTIONS CONSIDERED IN THE CUMULATIVE EFFECTS  
ANALYSIS**

Action	Description	Present	Reasonably Foreseeable
<b>Forest Service Lands</b>			
Fuels Management, Wildfire Suppression, and Vegetation Management Activities within the Hemlock Elk Project Area	Fire Suppression Activities will occur as needed. Control of wildfires will follow Forest Plan standards for the affected Management Areas.	X	X
Routine Road Management	Routine road maintenance will occur as needed on roads in the project area, separate from any road maintenance identified in this EA. Maintenance includes road grading, gate repair/replacement, cleaning ditches and culverts, brushing, and debris removal. Additional culverts are likely to be installed as needed.	X	X
	BMP improvements of culverts replacements in the Cold Creek Drainage on Road #9591 (9 miles) (Summer 2008)		X
Special Use Permits within the Hemlock Elk McKay Project Area	T21N R17W Section 15 – Missoula County FRTA Road Easement; T21N R17W Sections 25 and 36 - Montana Department of Transportation Easements; T21N R17W Sections 14, 25, and 36 - Power line to Missoula Electric Cooperative; T21N F17W Sections 14, 15, 16, 25, and 36 - Fiber Optic Cable and Power line T20N R17W Sections 6, 7, and 28 - FRTA Road Easements to Burlington Northern & Santa Fe Railroad; T20N R17W Section 32 - FRTA Road Easement to PCTC		
Noxious Weed Management within the Hemlock Elk Project Area	Efforts to control infestations of noxious weeds and reduce new infestations are ongoing and would continue through the foreseeable future. Control actions may include hand spraying herbicides, hand pulling, and biological control. All activities would comply with the 2001 Flathead National Forest Noxious and Invasive Weed Control EA and DN.		
Land Acquisition	Land & Water Conservation Fund Proposed Acquisition of PCTC Lands in the Swan Valley		1222 acres – Upper Swan Valley Linkage Zone (FY 2009) 1240 acres – Lower Cold, Smith, and Condon Creeks Linkage Zone (FY2010) 915 acres – Lower Cold, Smith, and Condon Creeks Linkage Zone (FY2011) 960 acres – Lower Lion and Piper Creeks Linkage Zone (2012) 1279 acres - Lower Lion and Piper Creeks Linkage Zone (2013)
<b>Private and Industrial lands</b>			
PCTC Fuels Management, Wildfire Suppression, and Vegetation Management Activities	Vegetation Management within the Hemlock Project Area (2007 - 2010)		640 acres; Grizzly Meadow Commercial Thin (2009)
			160 acres; Stoner Lake Pre-Commercial Thin
PCTC Road Management, Maintenance, and Closures within the Hemlock Elk Project Area	Road maintenance associated with vegetation management activities	X	X
PCTC Land Sales	Sale of PCTC Lands within the Hemlock Elk Project Area (2008)	None planned within the Hemlock Elk Project Area.	
	PCTC Lands Sales within the Swan Valley (In addition see Special Note below)	120 acres – T22N R17W, Section 5 portion lying west of Hwy 83 480 acres – T22N R17W, Section 29 except portion in SW ¼	

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**TABLE 3-2.  
PRESENT AND REASONABLY FORESEEABLE ACTIONS CONSIDERED IN THE CUMULATIVE EFFECTS  
ANALYSIS**

Action	Description	Present	Reasonably Foreseeable
		140 acres – T22N R17W, S ½ Section 21 lying east of Highway 83 640 acres – T21N R17W, Section 31 200 acres – T21N R17W S ½ Section 11 lying east of Highway 83 and north of Holland Creek 640 acres – T20N R16W Section 33	
Private Land Development	Missoula County	No pending applications for subdivision development.	
<b>Montana State and Counties (Missoula &amp; Lake)</b>			
State of Montana Timber Harvest	Vegetation Management within the Hemlock Elk Project Area	No Montana State lands lie within the Project Area.	
	Vegetation Management within the Swan Valley	2064 acres - White Porcupine Multiple Timber Sale T23N R18W Sections 12, 13, 16, 22, 23, 24, 26, & 28 and T24N R18W Sections 22, 23, 24, 25, 26, 28, 34 & 36, 240 acres – Winter Blowdown Salvage T23N R28W Sections 24, & 26, and T23N R17W Sections 20, 30, 23 & 34 1884 acres - Three Creeks FEIS T24N R17W Sections 1, 3, 4, 9, 10, 11, 14, 15, 16, 22, 25, 26 and 27	
Road Management/Maintenance	Road Construction within the Swan Valley	Three Creeks Timber Sale - 7.5 to 16 miles of new roads and 3 to 7 miles of new temporary roads	
	Applications of BMPs within the Swan Valley	56 miles - Three Creeks Timber Sale	
<b>All Forest Lands (NFS, Public &amp; Timber Industry) Actions</b>			
Dispersed Recreation within the Hemlock Elk Project Area	The area offers a variety of motorized and non- motorized year-round recreation opportunities including, hiking, cross-country skiing, mountain biking, hunting, fishing, gathering forest products, driving for pleasure, and snowmobiling. Hemlock Peak Trail #515, Hemlock Lake Trail #607, and Elk Creek Trail #301 are Forest Development Trails located within the Project Area.	X	X

**Special Note:** The recently passed Farm Bill contains provisions that lay the groundwork for a potential large scale purchase of PCTC lands in Montana that include PCTC ownership in the Swan Valley. Implementing guidelines and financing of the potential purchase are being developed at this time. There is potential for PCTC lands within the project area to be acquired by a third party (Nature Conservancy/Trust for Public Lands) and to be subsequently conveyed to new land owners, after meeting a 10 to 15 year timber supply agreement with PCTC. The specific nature of timing, location, and disposition of the lands is not fully developed at this time and to that extent is not reasonably foreseeable in detail. An outcome of this developing proposal is that there may be increased National Forest ownership over time in the project area. For the purposes of this analysis only definitive, land transaction are shown.

## Forest Plan Management Direction

The Forest Plan sets management direction for this project area.

The Forest Plan provides forest-wide goals and objectives (pages II-1 through II-57). The Forest Plan also divides the Flathead National Forest into subunits called management areas (MAs). Each of these MAs has resource or activity goals and management standards (Forest Plan, pages III-1 through III-126). In keeping with Forest Service policy on multiple use, the Forest Plan established goals to strike a balance among different resources (Forest Plan, page II-5).

A brief overview of each of the MAs in this project area follows. More specific Forest Plan direction is discussed in each resource section later in this chapter.

**TABLE 3-3.  
 MANAGEMENT AREA DESCRIPTIONS, EMPHASIS, AND MANAGEMENT AREA ACRES FOR THE  
 HEMLOCK ELK PROJECT**

MA	Description	Management Emphasis	Total Acres
1	Non-forest lands and timberlands where timber management is uneconomical or currently technologically infeasible due to topographic features.	Maintain the present condition with minimal investment for resource activities, while protecting the basic soil, water, and wildlife resources.	201
9	Timberlands capable of providing white-tailed deer winter habitat.	Provide cover and forage areas suitable for white-tailed deer winter habitat.	160
12	Riparian Areas consisting of aquatic, riparian, and portion of terrestrial ecosystems along most perennial streams, lakes, ponds, marshlands, bogs and some important seasonal flows.	Manage to enhance vegetation and wildlife diversity and maintain or enhance water quality and fisheries.	372
15	Timberlands where timber management with roads is economical and feasible.	Timber production.	5,734
15C	Timberlands where timber management with roads is economical and feasible, and are key white-tailed deer summer range.	Special considerations will be given to the white-tailed deer summer range.	2,800
22	Classified wilderness designated in 1975 by the U. S. Congress.	Manage this area in accordance with the Wilderness Act of 1964 to maintain an enduring system of high quality wilderness representative of all National Forest ecotypes.	17,648
<b>TOTAL NFS LANDS</b>			<b>26,915</b>

Refer to Map 3-1 at the end of this chapter for a display of MAs in the analysis area.