

# Chapter 2: Alternatives Considered

## Introduction

This chapter describes and compares the alternatives considered for the Mid Swan Blowdown Salvage Project. The alternatives for the Mid Swan Project were developed from the issues identified by the ID Team, the public, and other agencies. The ID Team grouped the alternatives into one of two categories depending upon how they met the Purpose and Need for the project and their feasibility. These categories are “alternatives considered in detail” and “alternatives not considered in detail.” Rationale is given for those alternatives not studied in detail.

This chapter also includes a description and map(s) of the alternatives considered, activities common to all alternatives, and a comparison of these alternatives focusing on the significant issues. This comparison of alternatives provides a basis for choice among the options for the decision maker and the public (40 CFR 1502.14).

## Public Involvement and Scoping Process

The CEQ defines scoping as:

“... an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action” (40 CFR 1501.7)

Among other things, the scoping process is used to invite public participation, to help identify public issues, and to obtain public comment during the EA process. Scoping should begin early and continue until a decision is made. To date, the public has been invited to participate in the following ways.

### Public Mailing

On October 10, 2008, information on the Mid Swan Project (including a vicinity map and a map of the proposal) was mailed out (Project File Exhibit B-2). This information was mailed to approximately 70 individuals, agencies, and groups.

### Public Notice

A request for comments on the Mid Swan Blowdown Salvage Project was published in *The Daily Interlake* on October 16, 2008 (Project File Exhibit B-3). Notification of this project proposal appeared in the January 1, 2009, USDA Forest Service’s Schedule of Proposed Actions (SOPA) (Project File Exhibit B-7).

The Swan Lake Ranger District received approximately 33 responses on the Mid Swan Project, either in the form of letters, e-mails, or telephone contacts.

On October 30, 2008, a Field Trip to the Mid Swan Project Area was held. In addition to Forest Service Representatives, 10 members of the public participated in the Field Trip. A second Field Trip

was held on November 4, 2008, to visit Units 6 and 8 where blowdown material removal was proposed within RHCAs; seven members of the public attended this Field Trip.

## Issues

The ID Team reviewed and compiled a list of potential issues based upon comments from the public, organizations, and government agencies. These issues were then evaluated against the following criteria to determine the appropriate method for resolution:

- Is the issue relevant to and within the scope of the purpose and need, the decisions being made, and does it pertain directly to the Proposed Action?
- Is the issue already decided by law, regulation, or existing plans. Is it supported by scientific or factual evidence?
- Could the issue be resolved through design and location of activities in the Proposed Action or mitigated by avoiding the impact of not taking action, minimizing the impact by limiting the action, rectifying the impact by rehabilitation, reducing the impact by maintenance, or compensating for the impact by replacement?

Issues representing an unresolved conflict with the Proposed Action have been brought forward as “major issues” and were used to help formulate the alternatives to the Proposed Action. Project File Exhibit D-1 provides a detailed description of the issues identified during the scoping process and describes how those issues were accounted for during the analysis process.

## Key Issues for Alternative Development

During the issues content analysis and disposition process, the ID Team and District Ranger identified the following “key” issues, for which action alternatives were developed.

### 1. Blowdown Removal in Old Growth

The statements below are examples of comments received during scoping which articulated issues or concerns relative to removal of blowdown in old growth stands.

- “Down woody recruitment is particularly critical in existing stands of old-growth forest, which you indicate would have downed wood removed in Units 2, 5, 13, and 18. As we recall, the Forest Plan standards requiring the retention of down woody “debris” (a term we are loath to use due to the wood’s essential contribution to old-growth and other forest functions) are insufficient and err on the side of logging rather than ecosystem function and resiliency. Therefore, we especially urge you to not salvage log in these old-growth stands.” (Project File Exhibit BB-34)
- “Old-growth forests are pretty scarce in this area due to the checkerboard ownership, past logging and road building. How much old-growth forest habitat is there in this area? Where is it? What is next to it? How connected is it? Where are mature stands that can be recruited as replacement old growth? What old-growth dependent wildlife are using it? We believe there should be an effort by the Flathead to connect rather than fragment old-growth forest habitat.” (Project File Exhibit BB-35)
- “We request that the FNF also develop an alternative that does not propose harvest in any old growth or previously unlogged stands.” (Project File Exhibit BB-34).

**Issue Indicator:** Acres of treatment within old growth stands.

## **2. Blowdown Removal in Riparian Habitat Conservation Areas**

There were concerns with the proposed removal of blowdown within Riparian Habitat Conservation Areas (RHCAs). The following statements from the scoping comments are examples of concerns about riparian habitat:

- “In order to deviate from the INFISH standards the District must perform an Ecosystem Analysis at the Watershed Scale. Lion Creek is a key bull trout spawning stream that needs to be protected and INFISH maintains degraded conditions. The US Fish and Wildlife Service’s (USFWS) Biological Opinion of the Effects to Bull Trout and Bull Trout Critical Habitat from Road Management Activities on National Forest System and Bureau of Land Management Lands in Western Montana (April 29, 2008) summarized the baseline condition in the Swan as:
  - “The current status of the species in this core area is amongst the strongest in the entire range, though numerically redd counts are down about 30% since the peak level recorded in 1998, so the trend is no longer considered increasing.” (BiOp at pg 36)
  - At a minimum Lion Creek needs the INFISH buffers, it’s not worth gambling with such an important bull trout spawning stream.
  - How will this project protect and restore native fish habitat?” (Project File Exhibit BB-35)
- “Downed wood is also a critical component of riparian habitats, both within and outside the stream channel. We urge you to not salvage downed wood in formally designated Riparian habitat Conservation Areas and less formal riparian areas (Project File Exhibit BB-34).”
- “Unit 8 is adjacent to Lion Creek that requires a temporary road. The proposal plans to deviate from INFISH 300 foot buffers and place only ~100 foot buffers on Lion Creek. The riparian buffers are necessary not only to protect the stream but they also serve as travel corridors and connectivity for wildlife. For that reason it is prudent to stay at least 300 feet from Lion Creek.” (Project File Exhibit BB-35).
- “Lion Creek is not a ‘timber basket,’ it is one of the most ecologically sensitive watersheds in the Swan Valley. Priority should be given to watershed values, including game and non-game wildlife species, bull trout, cutthroat trout, and water quality.” (Project File Exhibit BB-36)

**Issue Indicator:** Acres of treatment within RHCAs.

### **Other Concerns Evaluated**

The team evaluated other concerns that helped frame the scope of the analysis during the scoping process. These concerns were not considered major issues because they were resolved through project design and, therefore, were not used to develop alternatives analyzed in detail. These concerns are addressed within the effects analysis by resource in Chapter 3 of this document.

#### **Threatened, Endangered, and Sensitive (TES) Wildlife, Fish, and Plant Species:**

Commenters expressed concern over how the Proposed Action would affect TES species including grizzly bear, Canada lynx, bull trout, and water howellia. Design Criteria will be incorporated into the EA to address these concerns. In addition, all applicable laws and regulations would be met in the design and implementation of this project (Project File Exhibit BB-1, BB-34, and BB-35).

**Soils:** Commenters also expressed concern over how the proposed activity would affect soil quality and productivity. Design Criteria would be incorporated into the EA to address these concerns. In addition, all applicable laws and regulations would be

met in the design and implementation of this project (Project File Exhibits BB-1 and BB-35).

**Coarse Woody Debris:** Several comments were received on insuring that adequate amounts of coarse woody debris are maintained in the units. Criteria would be incorporated into the EA to address these concerns. In addition, all applicable laws and regulations would be met in the design and implementation of this project (BB-1 and BB-34).

## Range of Alternatives

Section 102(2)(3) of the NEPA states that all Federal agencies shall “study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflict concerning alternative uses of available resources.”

An EA must also “rigorously explore and objectively evaluate all reasonable alternatives.” The courts have established that this direction does not mean that every conceivable alternative must be considered, but all selection and discussion of alternatives must permit a reasoned choice and foster informed decision making and informed public participation.

The range of alternatives may extend beyond the limits set by Forest Plan goals and objectives under the NEPA; however, the NFMA requires that the selected alternative fully comply with the Forest Plan, unless the plan is amended in accordance with 36 CFR 219.10(f).

The range of alternatives presented in this chapter was determined by evaluating public and internal comments and the Purpose and Need for this project. This project is intended to maintain or create resource conditions that are within the range of natural (historical) variability (HRV) – conditions which might be expected to occur under natural disturbance and succession regimes. By moving toward this condition, we can be more assured that the forest and ecosystem remain in a healthy and sustainable condition over time. The vulnerability of the forest to possible severe and undesirable effects of fire, insects, disease, or other unforeseen events would be reduced, creating a forest that is more resilient in the face of inevitable change and future uncertainties, providing for flexibility, and a wide variety of possible future resource and management needs.

Other influences included Forest Plan goals, objectives, existing and desired conditions, standards and guidelines; Federal laws, regulations, and policies; and economic viability. Within these parameters, the alternatives developed by the ID Team display a reasonable range of outputs, treatments, costs, management requirements, design criteria, and effects on resources.

In addition to the alternatives considered in detail, the ID Team examined other alternatives during the analysis process. Although these alternatives contributed to a reasonable range, they were eliminated from further consideration for the reasons listed below.

## Alternatives Not Considered in Detail

This section discusses an additional alternative that was considered, but not given detailed study. This alternative was initially proposed to address issues identified during the public scoping and ID Team process, but was not considered further for the reasons explained in the following narrative.

**Maximize Salvage Opportunities:** Under this alternative, additional salvage activities were considered in Units 7 and 12. Salvage activities in Unit 7 were deferred because the area exhibited moist soils with a high water table and potential orchid habitat. Unit 12 was deferred as the unit is located within a floodplain, has potential orchid habitat, provides Canada lynx habitat, and is known for frequent use

by grizzly bears. It was felt that the issues associated with these units could not be addressed with Design Criteria to protect the resources and retain a viable salvage unit. Unit 25 was significantly reduced in size to avoid the effects of removing blowdown in wet areas and addressing the presence of water howellia, cedar, and spruce in the stand.

Similarly, other stands in the area were considered for blowdown salvage. Section 22 also received considerable tree damage from the wind events of June and July of 2008. These areas of blowdown trees in Section 22 are located within active sale units and removal of the material would be accomplished through existing timber sale contracts.

For these reasons, an alternative to treat more extensively and intensively within the blowdown areas was not considered in detail.

## Alternatives Considered in Detail

### Alternative A – No Action

This alternative represents the existing condition in the Mid Swan Salvage Blowdown Project Area. Under this alternative, none of the activities proposed for the Mid Swan Project would occur. No salvage activities, temporary road and access management, and planting activities to aid in vegetation recovery, or other activities associated with the proposed action would occur at this time. Ongoing activities such as recreation, public firewood gathering, fire suppression, and normal road maintenance would continue. Activities identified in Chapter 3 as current and foreseeable actions would occur.

## Activities Common to the Action Alternatives

Given the nature of this project, only one silvicultural treatment is proposed - Salvage Harvest. Associated fuel treatments, site preparation and reforestation treatments are also proposed. Descriptions of proposed treatments follow:

### Vegetation Management

**Salvage Harvest:** The purpose of this entry is to remove dead, dying, or damaged trees from treatment areas to recover economic value that would otherwise be lost. The primary agent of damage is wind, which has resulted in trees which are uprooted, broken, and/or severely leaning. Merchantable trees, which have been killed by other damage agents and are located within the treatment areas, may also be removed in this entry. Damage severity is variable within and across treatment areas. In severely affected areas, reforestation may be necessary. Regeneration would likely result from a combination of natural seeding and planted seedlings. Mechanical logging systems would be used to extract merchantable material and reduce logging slash/fuel loadings. It is likely that some incidental live or dead, non-wind damaged trees would need to be felled to facilitate skid trails, yarding corridors, and/or landings. The exact location of these features would be agreed upon between the Forest Service and the Timber Sale Purchaser.

This treatment is proposed for **690** acres in Alternative B, **622** acres in Alternative C, and **636** acres in Alternative D.

**Fuel Treatments:** In order to reduce fuel loadings with the salvage units, a number of prescribed treatments are designed to reduce natural and activity generated fuels within the proposed treatment areas. These treatments include mechanical methods and the use of prescribed fire. Mechanical treatments could include a combination of the following: whole tree yarding, lopping and scattering, and/or excavator piling. Fuel accumulations at landings would be addressed through burning, chipping/masticating, and/or removal from NFS lands. Prescribed fire treatments could include pile burning and/or jackpot burning. See Appendix C in this document for more descriptions and visual illustrations of these fuel treatments.

**Site Preparation:** Depending on wind damage severity, existing vegetation, and ground conditions, site preparation may be prescribed to help create favorable conditions to help ensure adequate regeneration. These treatments are often prescribed in both artificial and natural regeneration situations and typically address competing vegetation, seed bed preparation, fuel accumulations, and duff reduction. Site preparation can be accomplished through hand, mechanical, or prescribed fire methods. Hand methods usually involve creating favorable conditions at the time of planting using hand tools. Mechanical treatments are often accomplished during harvest operations or shortly afterwards and involve scarification and seed bed preparation through the use of mechanized equipment. Prescribed fire can also be used to recycle nutrients, consume excess fuels, reduce competing vegetation, and create a favorable seedbed.

**Reforestation:** Within the proposed salvage units, reforestation is only proposed in areas where wind damage has resulted in an unstocked condition. As mentioned earlier, areas with severe wind damage are the exception in this project. All or portions of Units 6, 8, 10, and 11 are likely to have reforestation needs. The estimated total area that would require reforestation, by alternative, is shown below.

Approximately **90** acres are estimated to require reforestation in Alternative B, **83** acres in Alternative C, and **59** acres in Alternative D.

## Road Management

Road management activities common to the action alternatives include temporary road construction and road maintenance. No new permanent roads would be constructed with any of the action alternatives.

**Road Maintenance (BMPs):** The objectives of road maintenance are to reduce the concentration of sub-surface and surface water runoff, minimize road surface erosion, filter ditch water before entering streams, and decrease the risk of culvert failures during peak runoff events. Maintenance work could include culvert installation, replacement of existing culverts with larger culverts, installation of drainage dips and surface water deflectors, placement of rip-rap to armor drainage structures, aggregate surface cleaning where needed, and surface blading to restore drainage efficiency of the road surface. These actions would bring the roads up to current BMP standards, better accommodate traffic and reduce deferred maintenance. Best Management Practices are required under Timber Sale Contracts prior to hauling of timber over these roads.

Best Management Practices would be applied on **16.8** miles of haul route in Alternative B, **15.3** miles of haul route in Alternative C, and **16.2** miles in Alternative D.

**Temporary Road Construction:** Temporary roads would be constructed to the minimum standards necessary for log hauling on Forest Development Roads (FDR). Temporary road surface width would be limited to truck bunk width plus 4 feet. Temporary roads would be reclaimed following their use using drain dips, outslowing, scarifying, seeding, and re-contouring. Temporary road construction ranges from **0.3 miles** in Alternative B, **0** miles in Alternative C, and **0.1** miles in Alternative D.

**Historic Road Template:** A historic template can be defined as a constructed road surface that was once utilized for a transportation need but is not currently a part of the National Forest Road System. It has an overall template existing that has not been re-contoured, and is in a state that is impassible to full sized motor vehicles due to waterbars and culvert removals and/or closure by vegetation, earth berm, or other natural closure feature such as a slump or washout.

**Skid Trails:** Skid trails would be used for forwarding logs with a tractor from the felled location to a landing, where they are loaded on trucks and hauled away. In some instances, it may be necessary to have a designated skid trail outside of the unit boundary a short distance to a nearby landing location adjacent to the haul route. Skid trails would be reclaimed following their use using drain dips, outslowing, scarifying, seeding, and recontouring. Under all Action Alternatives, **0.5** miles of skid trail would be used.

Please refer to Table 2-1 below for a summary by alternative of management activities.

**TABLE 2-1.  
TREATMENT SUMMARY BY ALTERNATIVE**

	Alternative B		Alternative C		Alternative D	
Commercial Harvest Treatment Acres and Estimated Board Foot Volume (MMBF)						
	Acres	MMBF	Acres	MMBF	Acres	MMBF
Salvage	690	5.2	622	4.9	636	4.8
Logging System Acres						
Tractor	544		544		532	
Tractor/Skyline	82		75		45	
Forwarder	61		0		59	
Skyline	3		3		0	
<b>Total Logging System Acres</b>	<b>690</b>		<b>622</b>		<b>636</b>	
Fuels Treatment Acres						
Fuels Treatment within Wildland Urban Interface	322		298		321	
Fuels Treatment outside Wildland Urban Interface	358		324		315	
Road Management Miles						
Haul Routes (BMPs to be applied to meet Timber Sale Requirements)	16.8		15.3		16.2	
Temporary Road Construction	0.3		0.0		0.1	
Use of Historic Road Template	1.0		0.5		1.0	
Skid Trails	0.5		0.5		0.5	

## Design Criteria

Table 2-14 located at the end of this chapter describes the Design Criteria applied to this project to protect resources.

### Monitoring

Monitoring and evaluation compared the results being achieved to those projected in the Forest Plan. Monitoring is conducted on a sample basis to evaluate the overall progress in implementing the Forest Plan, the assumptions on which the Forest Plan is based, and to provide a feedback loop for determining effectiveness of project and mitigation implementation (USDA Forest Service 1987a). For this project, monitoring and evaluation would be conducted as described in Appendix A of this document. Those monitoring components not specifically discussed in this appendix tier to the monitoring described in the Forest Plan.

## Activities Specific to the Action Alternatives

Features unique to each alternative are described below. Maps displaying each alternative (Maps 2-1, 2-2, and 2-3) are found at the end of this chapter.

### *Alternative B – Proposed Action (Map 2-1)*

**Intent:** Alternative B was developed to respond to the Purpose and Need for the Mid Swan Blowdown Salvage Project.

The Proposed Action focuses on salvaging blown down trees resulting from the wind events of the summer of 2008 using commercial vegetation treatments. Features associated with this alternative include the following:

- Treatments that would salvage blown down trees on a total of about **690 acres**.
- Fuels Treatment on **322 acres** within the Wildland Urban Interface.
- Fuels Treatment on **358 acres** outside of the Wildland Urban Interface.
- Road maintenance to meet BMP standards on approximately **16.8 miles** of haul roads as required for the Timber Sale Contract.
- An estimated **0.3 miles** of temporary road construction to access harvest units as shown in Table 2-3 below.
- Use of an estimated **1.0 mile** of historic road templates.
- Use of an estimated **0.5 miles** of skid trails.

**TABLE 2-2.  
 TEMPORARY/HISTORIC TEMPLATE/SKID TRAILS NEEDED FOR ALTERNATIVE B**

Unit	Road Type	Access Needs	Miles
3	Historic Template	Access via FDR #9882	0.1
8	Historic Template	Access via FDR #5377	0.4
8	New Temporary road	Access via FDR #9882	0.2
18	Historic Template	Access via MT Highway 83	0.5

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**TABLE 2-2.**  
**TEMPORARY/HISTORIC TEMPLATE/SKID TRAILS NEEDED FOR ALTERNATIVE B**

Unit	Road Type	Access Needs	Miles
18	New Temporary Road	Access via Historic Template	0.1
16	Skid Trail	Access via FDR #9769 to #10323	0.2
19	Skid Trail	Access via FDR #11630	0.3
<b>TOTAL MILES OF TEMPORARY/HISTORIC TEMPLATE/SKID TRAILS NEEDED FOR ALTERNATIVE B</b>			<b>1.8</b>

Alternative B salvage harvest and associated activities are summarized in the table below.

**TABLE 2-3.**  
**SUMMARY OF PROPOSED TREATMENT ACTIVITIES FOR ALTERNATIVE B**

<b>Commercial Harvest Treatment Acres</b>	
Salvage	690
<b>Logging System Acres</b>	
Tractor	544
Tractor/Skyline	82
Forwarder	61
Skyline	3
<b>Total Logging System Acres</b>	<b>690</b>
<b>Fuels Treatment Acres</b>	
Lop and Scatter	157
Lop and Scatter/Jackpot Burn	6
Whole Tree Yard (WTY)*	32
Whole Tree Yard/Excavator Pile/Burn Piles	209
Whole Tree Yard/Excavator Pile/Burn Piles/Jackpot Burn	286
<b>Road Management Miles</b>	
Haul Routes (BMPs to be applied to meet Timber Sale Requirements)	16.8
Temporary Road Construction	0.3
Use of Historic Template	1.0
Skid Trails	0.5

\*Within this project Whole Tree Yarding can include one or a combination of the following treatments:

- 1) Purchaser shall leave tops and limbs of felled trees attached to Included Timber and yard them to landings as shown on the Hazard Reduction and Site Preparation Map. Tops and limbs which are lost on the way to the landing site due to normal felling, skidding and/or yarding operations are not required to be yarded.
- 2) Purchaser shall leave the tops of felled trees attached to the top log and yard them to landings as shown on the Hazard Reduction and Site Preparation Map. Limbs on Included Timber portion are removed and left in woods and trees are tree-length or log-length skidded.

TABLE 2-4.  
 PROPOSED TREATMENT ACTIVITIES FOR ALTERNATIVE B

Unit No.	Unit Acres	Alternative B Treatment	Logging System	Slash Treatment	Forest Plan MA Direction
1	15	Salvage	Tractor	Lop and Scatter	MA 9
2	9	Salvage	Forwarder	Lop and Scatter	MA 9
3	27	Salvage	Tractor	WTY/Excavator Pile/Burn Piles	MA 9
4	16	Salvage	Tractor/Skyline	WTY/Excavator Pile/Burn Piles/Jackpot Burn	MA 9
5	8	Salvage	Forwarder	Lop and Scatter	MA 9
6	29	Salvage	Tractor/Skyline	WTY	MA 9
8	31	Salvage	Tractor/Skyline	WTY/Excavator Pile/Burn Piles/Jackpot Burn only in Flood Plain	MA 9
9	6	Salvage	Tractor/Skyline	Lop and Scatter/Jackpot Burn	MA 9
10	62	Salvage	Tractor	WTY/Excavator Pile/Burn Piles/Jackpot Burn	MA 9
11	177	Salvage	Tractor	WTY/Excavator Pile/Burn Piles/Jackpot Burn	MA 9
13	11	Salvage	Forwarder	Lop and Scatter	MA 9
14	24	Salvage	Tractor	Lop and Scatter	MA 9
15	13	Salvage	Tractor	Lop and Scatter	MA 9
16	34	Salvage	Tractor	WTY/Excavator Pile/Burn Piles	MA 9
17	6	Salvage	Tractor	Lop and Scatter	MA 9
18	33	Salvage	Forwarder	Lop and Scatter	MA 9
19	11	Salvage	Tractor	Lop and Scatter	MA 9
20	24	Salvage	Tractor	WTY/Excavator Pile/Burn Piles	MA 9
21	19	Salvage	Tractor	WTY/Excavator Pile/Burn Piles	MA 9
22	65	Salvage	Tractor	WTY/Excavator Pile/Burn Piles	MA 9
23	40	Salvage	Tractor	WTY/Excavator Pile/Burn Piles	MA 5/9
24	2	Salvage	Skyline	WTY	MA 9
25	1	Salvage	Skyline	WTY	MA 9
26	27	Salvage	Tractor	Lop and Scatter	MA 9
<b>TOTAL</b>	<b>690 Acres</b>				

***Alternative C  
 (Map 2-2)***

**Intent:** Alternative C was developed to respond to Issue #1, Blowdown Removal in Old Growth Stands.

Under this alternative, no treatments would be proposed in old growth forest habitat. This alternative was developed based upon concerns from the public that treatments within old growth stands could destroy old growth attributes and adversely impact wildlife species associated with old growth communities. Features associated with this alternative include the following:

- Treatments would salvage blown down trees on a total of about **622 acres**.

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- No treatment in stands possessing old growth attributes. **Units 2, 5, 13, and 18**, totaling **61 acres** are dropped from this alternative.
- A portion of Unit 8 totaling 7 acres was dropped due to additional field validation indicating a non-viable salvage unit.
- Fuels Treatment on **298 acres** within the Wildland Urban Interface.
- Fuels Treatment on **324 acres** outside of the Wildland Urban Interface.
- Road maintenance to meet BMP standards on approximately **15.3 miles** of haul roads as required for the Timber Sale Contract.
- No temporary road construction is needed to access harvest units.
- Use of an estimated **0.5 miles** of historic templates to access **Units 3 and 8**.
- Approximately **0.5 miles** of skid trails to access **Units 16 and 19**.

Alternative C salvage harvest and associated activities are summarized in the tables below.

**TABLE 2-5.**  
**TEMPORARY/HISTORIC TEMPLATE/SKID TRAILS NEEDED FOR ALTERNATIVE C**

Unit	Road Type	Access Needs	Miles
3	Historic Template	Access via FDR #9882	0.1
8	Historic Template	Access via FDR #5377	0.4
16	Skid Road	Access via FDR #9769 to #10323	0.2
19	Skid Road	Access via FDR #11630	0.3
<b>TOTAL MILES OF TEMPORARY/HISTORIC TEMPLATE/SKID TRAILS NEEDED FOR ALTERNATIVE C</b>			<b>1.0</b>

**TABLE 2-6.**  
**SUMMARY OF PROPOSED TREATMENT ACTIVITIES FOR ALTERNATIVE C**

<b>Commercial Harvest Treatment Acres</b>	
Salvage	622
<b>Logging System Acres</b>	
Tractor	544
Tractor/Skyline	75
Forwarder	0
Skyline	3
<b>Total Logging System Acres</b>	<b>622</b>
<b>Road Management Miles</b>	
Haul Routes (BMPs to be applied to meet Timber Sale Requirements)	15.3
Temporary Road Construction	0
Use of Historic Templates	0.5
Skid Trails	0.5

**TABLE 2-7.**  
**PROPOSED TREATMENT ACTIVITIES FOR ALTERNATIVE C**  
**(No Activities in Old Growth Stands)**

Unit No.	Unit Acres	Alternative C Treatment	Logging System	Slash Treatment	Forest Plan MA Direction
1	15	Salvage	Tractor	Lop and Scatter	MA 9
3	27	Salvage	Tractor	WTY/Excavator Pile/Burn Piles	MA 9
4	16	Salvage	Tractor/Skyline	WTY/Excavator Pile/Burn Piles/Jackpot Burn	MA 9
6	29	Salvage	Tractor/Skyline	WTY	MA 9
8	24	Salvage	Tractor/Skyline	WTY/Excavator Pile/Burn Piles/Jackpot Burn only in Flood Plain	MA 9
9	6	Salvage	Tractor/Skyline	Lop and Scatter/Jackpot Burn	MA 9
10	62	Salvage	Tractor	WTY/Excavator Pile/Burn Piles/Jackpot Burn	MA 9
11	177	Salvage	Tractor	WTY/Excavator Pile/Burn Piles/Jackpot Burn	MA 9
14	24	Salvage	Tractor	Lop and Scatter	MA 9
15	13	Salvage	Tractor	Lop and Scatter	MA 9
16	34	Salvage	Tractor	WTY/Excavator Pile/Burn Piles	MA 9
17	6	Salvage	Tractor	Lop and Scatter	MA 9
19	11	Salvage	Tractor	Lop and Scatter	MA 9
20	24	Salvage	Tractor	WTY/Excavator Pile/Burn Piles	MA 9
21	19	Salvage	Tractor	WTY/Excavator Pile/Burn Piles	MA 9
22	65	Salvage	Tractor	WTY/Excavator Pile/Burn Piles	MA 9
23	40	Salvage	Tractor	WTY/Excavator Pile/Burn Piles	MA 5/9
24	2	Salvage	Skyline	WTY	MA 9
25	1	Salvage	Skyline	WTY	MA 9
26	27	Salvage	Tractor	Lop and Scatter	MA 9
<b>TOTAL</b>	<b>622 Acres</b>				

***Alternative D***  
***(Map 2-3)***

**Intent:** Alternative D was developed to respond to Issue #2, Blowdown Removal within RHCAs.

This alternative was developed to address the concern about the removal of blowdown within RHCAs. Features associated with this alternative include the following:

- **Units 24 and 25** are dropped, totaling 3 acres as they are located within RHCAs.
- **Units 3, 4, 6, 8, 9, 10, 14, 16, 18, 23, and 26** are modified, removing portions of these units from the RHCAs resulting in 51 acres less of blowdown removal.
- Treatments would salvage blowdown trees on a total of about **636 acres**.
- Fuels Treatment on **321 acres** within the Wildland Urban Interface.
- Fuels Treatment on **315 acres** outside of the Wildland Urban Interface.
- Road maintenance to meet BMP standards on approximately **16.2 miles** of haul roads as required for the Timber Sale Contract.

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- Approximately **0.1 miles** of temporary road construction would be needed to access harvest units.
- Approximately **1.0 mile** of use of historic templates would be needed to access harvest units.
- Approximately **0.5 miles** of skid trails would be needed to access harvest units.

Alternative D salvage harvest and associated activities are summarized in the tables below.

**TABLE 2-8.**  
**TEMPORARY/HISTORIC TEMPLATE/SKID TRAILS NEEDED FOR ALTERNATIVE D**

<b>Unit</b>	<b>Road Type</b>	<b>Access Needs</b>	<b>Miles</b>
3	Historic Template	Access via historic template from FDR #9882	0.1
8	Historic Template	Access via FDR #5377	0.4
18	Historic Template	Access via MT Highway 83	0.5
18	New Temporary Road	Access via Historic Template	0.1
19	Skid Trail	Access via FDR #11630	0.3
16	Skid Trail	Access via FDR #9769 to #10323	0.2
<b>TOTAL MILES OF TEMPORARY/HISTORIC TEMPLATE/SKID TRAILS NEEDED FOR ALTERNATIVE D</b>			<b>1.6</b>

**TABLE 2-9.**  
**SUMMARY OF PROPOSED TREATMENT ACTIVITIES FOR ALTERNATIVE D**

<b>Commercial Harvest Treatment Acres</b>	
Salvage	636
<b>Logging System Acres</b>	
Tractor	532
Tractor/Skyline	45
Forwarder	59
Skyline	0
<b>Total Logging System Acres</b>	<b>636</b>
<b>Slash Treatment Acres</b>	
Lop and Scatter	152
Lop and Scatter/Jackpot Burn	5
Whole Tree yard (WTY)	10
Whole Tree Yard/Excavator Pile/Burn Piles	205
Whole Tree Yard/Excavator Pile/Burn Piles/Jackpot Burn	264
<b>Road Management Miles</b>	
Haul Routes (BMPs to be applied to meet Timber Sale Requirements)	16.2
Temporary Road Construction	0.1
Use of Historic Road Templates	1.0
Skid Trails	0.5

**TABLE 2-10.**  
**PROPOSED TREATMENT ACTIVITIES FOR ALTERNATIVE D**  
**(No Activities in RHCA's)**

Unit No.	Unit Acres	Alternative D Treatment	Logging System	Slash Treatment	Forest Plan MA Direction
1	15	Salvage	Tractor	Lop and Scatter	MA 9
2	9	Salvage	Forwarder	Lop and Scatter	MA 9
3	25	Salvage	Tractor	WTY/Excavator Pile/Burn Piles	MA 9
4	11	Salvage	Tractor/Skyline	WTY/Excavator Pile/Burn Piles/Jackpot Burn	MA 9
5	8	Salvage	Forwarder	Lop and Scatter	MA 9
6	10	Salvage	Tractor/Skyline	WTY	MA 9
8	19	Salvage	Tractor/Skyline	WTY/Excavator Pile/Burn Piles/Jackpot Burn only in Flood Plain	MA 9
9	5	Salvage	Tractor/Skyline	Lop and Scatter/Jackpot Burn	MA 9
10	57	Salvage	Tractor	WTY/Excavator Pile/Burn Piles/Jackpot Burn	MA 9
11	177	Salvage	Tractor	WTY/Excavator Pile/Burn Piles/Jackpot Burn	MA 9
13	11	Salvage	Forwarder	Lop and Scatter	MA 9
14	22	Salvage	Tractor	Lop and Scatter	MA 9
15	13	Salvage	Tractor	Lop and Scatter	MA 9
16	33	Salvage	Tractor	WTY/Excavator Pile/Burn Piles	MA 9
17	6	Salvage	Tractor	Lop and Scatter	MA 9
18	31	Salvage	Forwarder	Lop and Scatter	MA 9
19	11	Salvage	Tractor	Lop and Scatter	MA 9
20	24	Salvage	Tractor	WTY/Excavator Pile/Burn Piles	MA 9
21	19	Salvage	Tractor	WTY/Excavator Pile/Burn Piles	MA 9
22	65	Salvage	Tractor	WTY/Excavator Pile/Burn Piles	MA 9
23	39	Salvage	Tractor	WTY/Excavator Pile/Burn Piles	MA 5/9
26	26	Salvage	Tractor	Lop and Scatter	MA 9
<b>TOTAL</b>	<b>636 Acres</b>				

## Comparison of Alternatives

This section provides a comparison of the alternatives in terms of:

- How the alternatives meet the Purpose and Need for the proposal;
- How the alternatives respond to the key issues;
- The potential environmental consequences associated with the implementation of the alternatives.

(Some activities are listed more than once because they meet more than one Purpose and Need.)

**TABLE 2-11.**  
**COMPARISON OF ALTERNATIVES – HOW THEY RESPOND TO THE PURPOSE AND NEED**

Purpose and Need Statement	Indicator	Alt. A	Alt. B	Alt. C	Alt. D
Recover Merchantable Timber from Areas Blown Down by Wind	Acres Treated	0	690	622	636
Provide Wood Products for Local Economics	MMBF	0	5.2	4.9	4.8

**TABLE 2-12.**  
**COMPARISON OF ALTERNATIVES – HOW THEY RESPOND TO THE KEY ISSUES**

Issue	Indicator	Alt. A	Alt. B	Alt. C	Alt. D
Blowdown Removal in Old Growth Areas	Acres of Removal in Old Growth Areas	0	59	0	54
Blowdown Removal in RHCAs	Acres of Removal in RHCAs	0	54	31	0

## Comparison of Environmental Effects

**TABLE 2-13.**  
**COMPARISON OF ENVIRONMENTAL EFFECTS BY ALTERNATIVE**

Environmental Consequence	Alt. A	Alt. B	Alt. C	Alt. D
<b>Soils – Meets Soil &amp; Water Standards</b>				
Detrimental soil disturbance resulting from alternative implementation <i>(Indicator: Units exceeding 15% detrimental oil disturbance)</i>	0	0	0	0
Meets Forest Service Regional Soil Quality Standard <i>(Indicator: Does or does not meet standard)</i>	Yes	Yes	Yes	Yes
<b>Hydrology</b>				
Road Maintenance to meet BMPs <i>(Indicator: Miles of existing roads brought to BMP standards)</i>	0	16.8	15.3	16.2
<b>Fisheries – T&amp;E and Sensitive Species</b>				
Bull Trout <i>(Indicator: BA Determination)</i>		May affect, not likely to adversely affect		
Cutthroat Trout <i>(Indicator: BE Determination)</i>		May impact individuals or habitat but will not likely result in a trend towards federal listing or reduced viability for the population or species.		No impact
<b>Wildlife– T&amp;E Species</b>				
Grizzly Bear <i>(Indicator: BA Determination)</i>	--	May affect, not likely to adversely affect		
Canada Lynx <i>(Indicator: BA Determination)</i>	--	May affect, not likely to adversely affect		

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TABLE 2-13.  
 COMPARISON OF ENVIRONMENTAL EFFECTS BY ALTERNATIVE

Environmental Consequence	Alt. A	Alt. B	Alt. C	Alt. D
Gray Wolf <i>(Indicator: BA Determination)</i>	--	May affect, not likely to adversely affect		
<b>Wildlife– Sensitive Species</b>				
Black-Backed Woodpecker, fisher, flammulated owl, western toad <i>(Indicator: BE Determination)</i>	--	May impact individuals or habitat, but will not likely result in a trend toward Federal listing or reduced viability for the population or species		
Bald eagle, common loon, harlequin duck, northern bog lemming, northern leopard frog, western big-eared bat, peregrine falcon, wolverine <i>(Indicator: BE Determination)</i>	--	No impact		
<b>Old Growth Associated Wildlife/Snag Dependent Wildlife Species</b>				
Meets Forest Plan Standards for snag and large woody debris retention. <i>(Indicator: Does or does not meet)</i>	Meets/Exceeds	Meets/Exceeds	Meets/Exceeds	Meets/Exceeds
<b>Wildlife – Commonly Hunted Big Game</b>				
Meets Forest Plan direction for winter range habitat.	Yes	Yes	Yes	Yes
<b>Forest Vegetation</b>				
Reduce the risk of bark beetle mortality in residual and adjacent stands. <i>(Indicator: Acres of Blowdown Removal)</i>	0	690	622	636
Harvest within old growth stands. <i>(Indicator: Acres of old growth where some portion of blowdown timber is removed)</i>	0	59	0	54
Amount and Kind of Snags and Coarse Woody Debris retained to balance habitat needs, ecological contributions, and fire hazards. <i>(Indicator: Reduces the risk of potential fire severity through removal of fuel loadings in forest stands)</i>	No	Yes	Yes	Yes
Reduce forest fuels buildup adjacent to public and private lands <i>(Indicator: Acres of treatment within WUI).</i>	0	332	298	321
Reduce forest fuels buildup adjacent to public and private lands <i>(Indicator: Acres of treatment outside of WUI)</i>	0	358	324	315

**Mid Swan Blowdown Salvage Environmental Assessment**  
**Chapter 2** **Alternatives Considered**

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**TABLE 2-13.**  
**COMPARISON OF ENVIRONMENTAL EFFECTS BY ALTERNATIVE**

<b>Environmental Consequence</b>	<b>Alt. A</b>	<b>Alt. B</b>	<b>Alt. C</b>	<b>Alt. D</b>
Regional Forester's Sensitive Plants <i>(Indicator: BE Determination)</i>	--	May affect individuals and habitat, but will not likely contribute to a trend towards Federal listing or cause a loss of viability		
Threatened Plant Species Water howellia <i>(Indicator: BA Determination)</i>	--	May affect, not likely to adversely affect		
Threatened Plant Species Spalding's catchfly <i>(Indicator: BA Determination)</i>	--	No effect		
Level of Risk of Noxious Weed Establishment and Spread <i>(Indicator: Acres treated)</i>	Low	Highest relative risk due to the highest number of acres treated (690 acres).	Lowest risk due to lowest number of acres treated (622 acres).	Moderate risk relative due to number of acres treated (636 acres).
<b>Recreation</b>				
Visual Resource – Meets Forest Plan VQOs	Yes	Yes	Yes	Yes
Restricts existing recreation opportunities	No	No	No	No
<b>Heritage Resource</b>				
Number of sites affected	0	1	1	1
<b>Social and Economic</b>				
Direct Employment	0	42.1	37.9	38.9
Total Jobs (Direct and Indirect)	0	98.7	93.0	91.9
<b>Products</b>				
Sawlogs (MMBF)	0	5.2	4.9	4.8

## Management Requirements and Design Criteria

The measures identified in the following table serve to further reduce impacts to the specific resources identified. Most are considered design criteria and are included in all action alternatives.

Several abbreviations are used in the responsibility section of Table 2-14. The following explains those abbreviations:

DR	District Ranger	BT	Botanist
SA	Sale Administrator	TMC	Timber Marking Crew
SP	Sale Prep	NWM	Noxious Weed Manager
WB	Wildlife Biologist	LEO	Law Enforcement Officer
FMO	Fire Management Officer	IDT	Interdisciplinary Team Members
ENG	Engineer	ARCH	Archaeologist
SILV	Silviculturist	HYD	Hydrologist
DRC	District Road Coordinator	TP	Timber Sale Purchaser
RF	Resource Forester	RA	Range Administrator
FAFMO	Fuels Assistant Fire Management Officer	SS	Soils Scientist
FISH	Fisheries Biologist		

**TABLE 2-14.  
MANAGEMENT REQUIREMENTS AND DESIGN CRITERIA**

OBJECTIVE	TASK	RESPONSIBILITY	DUE DATE
<b>Grizzly Bear Security and SVGBCA Compliance</b>	Comply with the Swan Valley Grizzly Bear Conservation Agreement (SVGBCA). The Lion Creek Subunit is active from 2009 through 2011 which includes Units 2 through 24. The Goat Creek Subunit, where Unit 1 is located, is Inactive. The Piper Creek Subunit, where Units 25 and Unit 26 are located, is also Inactive. Salvage Harvest, defined as harvest of dead or dying trees resulting from fire, disease, blowdown, or the like, may occur as long as the activity does not continue for periods of more than two consecutive weeks or for more than 30 days in the aggregate during a given calendar year. Salvage harvest may occur during the non-denning period (November 16 thru March 31).	WB, SA, SP	Pre - & Post - Sale
<b>Grizzly Bear Security</b>	Comply with SVGBCA rotation schedule. Implementation (sale layout and preparation) of the Mid Swan Blowdown Project is expected to begin in 2009. Harvest operations are expected to begin in 2009 and are anticipated to be completed within a two-year time frame. If contract extensions result in sale activities extending beyond 2011 in the Lion Creek Subunit, into the time period when the grizzly bear subunit is Inactive, then standards and guidelines for an Inactive grizzly bear subunit will be followed (as per Swan Valley Grizzly Bear Conservation Agreement).	WB, SA, SP	Pre & Post - Sale

Mid Swan Blowdown Salvage Environmental Assessment

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TABLE 2-14.  
MANAGEMENT REQUIREMENTS AND DESIGN CRITERIA

OBJECTIVE	TASK	RESPONSIBILITY	DUE DATE
<b>Grizzly Bear Security</b>	In order to avoid the potential disturbance of grizzly bear in important Spring Habitat, management activities that are planned in Spring Habitat, which is defined as areas within designated Linkage Zones, below 5,200 feet, will not occur within the Spring Period (April 1 thru June 15). This timing restriction would apply to <b>ALL</b> harvest units.	SP, SA, TMC, WB	Pre & Post - Sale
<b>Grizzly Bear Security – General Wildlife Security</b>	Where it exists, leave visual screening adjacent to open roads in proposed cutting units.	SP, SA, TMC, WB	Pre - & Post - Sale
<b>Wildlife – TES</b>	Include provisions in the contract to cease activity or otherwise protect populations and individuals of threatened or endangered species. This allows for modification of the project should an unforeseen issue(s) be identified during operations. Standard contractual requirements used in all contracts provide for modification or termination of the contract to avoid impacts and protect TES.	WB, SA, SILV	Contract Prep & During Harvest Activities
<b>Wildlife – TES</b>	Public motorized access would be restricted on temporary and skid roads normally closed to use.	WB, SA, DRC	Pre - & Post - Sale & During Harvest Activities
<b>Wildlife– TES</b>	Contractors working under contract would be prohibited from carrying firearms on normally closed roads within the project area on NFS lands, PCTC lands, or State lands (SVGBCA).	SA, LEO, WB	Pre & Post Sale, During Harvest Activities
<b>Wildlife – TES</b>	All temporary roads constructed on NFS lands would be reclaimed after use.	SA, DRC, WB	Post Sale
<b>Minimize ground disturbance in Old Growth Stands</b>	No landings would occur within unit boundaries of Units 2, 5, 13, and 18. Units 2, 5, 13, and 18 would be forwarder logged.	SP, SA, WB, FAFMO	During Harvest Activities
<b>Wildlife - Security</b>	Vegetation and/or rock barriers would be retained around berms and gates, where needed, to maintain closure effectiveness.	DRC, SA, WB	Pre & Post - Sale, During Harvest Activities
<b>Wildlife – Security</b>	If berms are removed for access to treatment units, temporary gates would be installed. Berms would be re-installed when sale activities are complete.	SB, SA, DRC	Pre & Post - Sale, During Harvest
<b>Snag Retention for Snag Associated Wildlife Species (Old Growth Units)</b>	To maintain appropriate snag densities in Old Growth Units, all snags within unit boundaries would be retained.  All standing dead cull western larch, ponderosa pine, and Douglas-fir trees 16 inches DBH or greater should be retained and all hardwood trees would be designated to be left. Generally, the snags to be left would be further than 100 feet from open roads and private land boundaries, and well distributed. Snags that pose a safety hazard to the Contractor's operation would be removed.	SILV, WB, SP,TMC, SA, TP	Pre & Post - Sale, During Harvest Activities
<b>Snag Retention for Snag Associated Wildlife Species (Non Old Growth Units)</b>	At a <i>minimum</i> , in Non Old Growth Units, 4 snags average per acre that are 12 to 20 inches DBH and 4 snags average per acre that are greater than 20 inches DBH would be left, where available. All standing dead cull western larch, ponderosa pine, and Douglas-fir trees 16 inches DBH or greater may be retained and all hardwood trees would be designated to be left. Generally, the snags to be left would be further than 100 feet from open roads and private land boundaries, and well distributed. Snags that pose a safety hazard to the Contractor's operation would be removed.	SILV, WB, SP,TMC, SA, TP	Pre & Post - Sale, During Harvest Activities

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Alternatives Considered

**TABLE 2-14.  
MANAGEMENT REQUIREMENTS AND DESIGN CRITERIA**

OBJECTIVE	TASK	RESPONSIBILITY	DUE DATE
<b>Retention of Down Woody Material for Down Woody Habitat Associated Wildlife Species (Old Growth Units)</b>	In Old Growth Units the minimum retention for down woody material would be approximately 27 to 30 tons per acre, where available. To achieve the tonnage required, retain (where it exists) down woody material which includes the longest material available (e.g. 16 ft long or longer) and retain the woody debris with the largest diameters available(e.g. 15" DBH or greater), sufficient to achieve the tons per acre. Material is preferred in the following order: pre-wind down woody material, then wind created down woody material, and finally activity generated material (logging slash) if needed.	SILV, WB, SP , SA, TP	Pre & Post - Sale, During Harvest Activities
<b>Retention of Down Woody Material for Down Woody Habitat Associated Wildlife Species (Non Old Growth Units)</b>	In Non Old Growth Units the minimum retention for down woody material would be approximately 12 tons per acre, where available. To achieve the tonnage required, retain (where it exists) down woody material which includes the longest material available (e.g.16 ft long or longer) and retain the woody debris with the largest diameters available (e.g. 15" DBH or greater), sufficient to achieve the tons per acre. Material is preferred in the following order: re-wind down woody material, then wind created down woody material, and finally activity generated material (logging slash) if needed.	SILV, WB, SP , SA, TP	Pre & Post - Sale, During Harvest Activities
<b>Public Safety</b>	Contracts would require the contractor to clearly post signs warning the public of nearby activities and truck hauling traffic associated with the treatments.	SA, DRM	Pre & Post - Sale, During Harvest Activities
<b>Public Safety</b>	The District Assistant Fire Management Officer (Fuels) or designated liaison would notify nearby landowners prior to fuel reduction activities commencing on NFS lands that are adjacent to their properties.	FAFMO	Pre - Sale, During Harvest Activities
<b>Special Use Permits</b>	All permitted improvements, including power and phone service lines and water transmission lines (authorized by special use permits) would be clearly marked and protected during project implementation.	SA, TMC, IF, FMO, SP, RF	Pre & Post - Sale
<b>Protect Site and Soil Productivity</b>	Skid trails must be spaced on average 75 to 100 feet apart. The goal is to occupy less than 15 percent of the harvest area, which includes soil disturbance from skid trails, temporary roads and landings associated with past and/or proposed activities.	SA, SP, SS	Pre & Post - Sale, During Harvest Activities
<b>Protect Site and Soil Productivity</b>	All mechanical fuel reduction would be accomplished with excavators. Excavators would, to the extent feasible, remain on skid trails.	SA	During Harvest Activities
<b>Protect Site and Soil Productivity</b>	All mechanized units would be logged using designated skid trails. Equipment would occasionally leave the trails to access trees or accomplish other activities.	SA, SP, SS	Pre & Post - Sale, During Harvest Activities
<b>Protect Site and Soil Productivity</b>	All existing roads and skid trails would be reused to the extent feasible unless doing so would adversely affect soil, water or other resources. Reusing existing roads and trails would reduce the amount of additional soil disturbance from implementation of the selected alternative. If roads or trails cannot be reused, their extent must be considered when laying out additional skid trails.	SA, SP, SS	Pre & Post - Sale, During Harvest Activities
<b>Protect Site and Soil Productivity</b>	All newly constructed temporary roads would be reclaimed after use, as soon as logistically practicable. The reclaiming of new temporary roads would include re-contouring the entire road template to natural ground contour, and to the extent feasible, placing the top soil back on the soil surface.	SA, SP, SS	Post-Sale

**TABLE 2-14.  
MANAGEMENT REQUIREMENTS AND DESIGN CRITERIA**

OBJECTIVE	TASK	RESPONSIBILITY	DUE DATE
<b>Protect Site and Soil Productivity</b>	Logging would occur when the soils are drier than field capacity as determined by the hand feel method as described in Project Record Exhibit J-16. This measure is especially critical in Unit 13.	SA, SS	During Harvest Activities
<b>Protect Site and Soil Productivity</b>	Sale administrators would monitor soil moisture conditions prior to allowing equipment to begin operations in summer. This monitoring must be documented in the Timber Sale Daily Report.	SA	Pre - Sale, During Harvest Activities
<b>Protect Site and Soil Productivity</b>	<p>If monitoring results indicate that detrimental soil disturbances for a given treatment unit exceed or equal 15 percent, then all or a portion of the following actions will be used to begin the restoration of soil quality. Restoration would occur on sites with a high amount of detrimentally disturbed ground such as designated skid trails and landings.</p> <ul style="list-style-type: none"> <li>Scarify heavily used skid trails and landings with the teeth on an excavator bucket to a depth of 2 to 4 inches.</li> <li>Plant Montana-certified weed free native grasses on the scarified soils as recommended by the Forest Botanist. This process would add organic matter to the soil and mulch to the surface.</li> <li>Plant native shrubs where needed to augment natural vegetation and scarification.</li> </ul>	SA, SS	During Harvest Activities, Post-Sale
<b>Improve Soil Condition</b>	All temporary roads constructed for this project that utilize existing road templates would be reclaimed by removing any installed culverts or temporary bridges, by placing large woody material on the template (where that material is available), and by seeding exposed soils with the native plant mix as specified by the Forest Botanist.	SA, TP, BT	Post-Sale
<b>Water Quality</b>	All drainage features would be put in place and functioning before, during, and after activities.	HYD, SA, SP, DRM	Pre - & Post - Harvest, During Harvest Activities
<b>Water Quality</b>	All activities will meet Montana Best Management Practices and the State Streamside Management Zone Law, therefore will comply with State Water Quality Laws and Federal Soil and Water Quality Handbook.	HYD, SA, SP	Pre - & Post - Harvest, During Harvest Activities
<b>Protect Fish Habitat (valley floor portions of Units 4, 6, and 8)</b>	In the floodplain/valley floor portions of Salvage Units 4, 6, and 8, the minimum retention for down woody material would be approximately 27 to 30 tons per acre, where available. Retained down woody material should consist of the longest pieces (e.g., 48 foot logs) with the largest diameters (e.g. – 12" DBH or greater) sufficient to achieve the tonnage required.	SA, TP	Pre & Post Harvest, During Harvest Activities
<b>Protect Fisheries Resource (Proposed Action and Alternative C)</b>	<p>Designate the following RHCA buffers for Salvage Units:</p> <p>Unit 1 No salvage activity within 300 feet from Goat Creek</p> <p>Unit 3 No salvage activity downhill over the steep part of the bluff towards Lion Creek. Equipment will stay on top of bluff entirely. Unit 3 has two wetlands. Both wetlands will be excluded from harvest. One will be</p>	SA, SP, FMO, FAFMO, FISH	Pre - & Post - Harvest, During Harvest Activities

**TABLE 2-14.  
MANAGEMENT REQUIREMENTS AND DESIGN CRITERIA**

OBJECTIVE	TASK	RESPONSIBILITY	DUE DATE
	<p>crossed with a skid trail.</p> <ul style="list-style-type: none"> <li>- Wetland exclusion means no removal of any portions of logs lying in wetland, no equipment allowed within 50 feet of wetland, tree removal allowed within 50 feet of wetland as long as no portion of log is not lying in wetland.</li> <li>- The wetland where a crossing would be authorized would have a designated skid trail to be used in dry soil conditions, as defined by the Soil Scientist.</li> </ul>		
	<p>Unit 4 No salvage activity within 125 feet of Lion Creek. To avoid an unsightly line, trees that are more than 50% within the exclusion zone would be entirely left. Trees that are more than 50% outside but have some within the exclusion zone can be salvaged. A portion of this unit lies within the valley floor of Lion Creek, extending beyond 125 feet.</p> <p>Floodplain area beyond 125 feet from Lion Creek:</p> <ul style="list-style-type: none"> <li>- no ground based equipment allowed within this floodplain</li> <li>- retain an average of 27-30 tons of down woody material</li> </ul>		
	<p>Unit 6 Within the riparian area of Trickle and Tumble Creeks (defined as 50 feet from each side of the stream)</p> <ul style="list-style-type: none"> <li>- Cable logging only, no equipment in riparian area.</li> <li>- Retain a minimum of 10 trees per 100 linear feet of stream. Retention trees must be touching the ground (bottom layer). Trees must be representative of stand sizes.</li> <li>-SMZ alternative practices would be obtained prior to work.</li> </ul> <p>A portion of this unit lies within the valley floor of Lion Creek, extending beyond 125 feet.</p> <p>Floodplain area outside the 2 streams and beyond 125 feet of Lion Creek:</p> <ul style="list-style-type: none"> <li>- no ground based equipment allowed within this floodplain</li> <li>- retain an average of 27-30 tons of down woody material</li> </ul>		
	<p>Unit 8 No salvage activity within 100 feet of Lion Creek. To avoid unsightly line, trees that are more than 50% within exclusion area would be entirely left. Trees that are more than 50% outside can be salvaged.</p> <p>A portion of this unit lies with the valley floor of Lion Creek, extending beyond 100 feet.</p> <p>Floodplain area beyond 100 feet of Lion Creek:</p> <ul style="list-style-type: none"> <li>- no ground based equipment allowed</li> <li>- retain an average of 27-30 tons of down woody material</li> </ul>		
	<p>Unit 9 No salvage activity within 300 feet from Lion Creek.</p>		

**TABLE 2-14.  
MANAGEMENT REQUIREMENTS AND DESIGN CRITERIA**

OBJECTIVE	TASK	RESPONSIBILITY	DUE DATE
	Unit 10 No salvage activity downhill from the bluff by Lion Creek.		
	Unit 14 No salvage activity downhill of the lower terrace by Lion Creek (there are multiple bluffs in this unit).		
	Unit 17 Wetland exclusion (no removal of any portions of logs laying in wetland, no equipment allowed within 50' of wetland, tree removal allowed within 50 feet of wetland as long as no portion of log is not laying in wetland).		
	Unit 18 Two wetland exclusions (no removal of any portions of logs laying in wetland, no equipment allowed within 50' of wetland, tree removal allowed within 50' of wetland as long as no portion of log is within wetland).		
	Unit 22 Three wetland exclusions (no removal of any portions of logs laying in wetland, no equipment allowed within 50 feet of wetland, tree removal allowed within 50 feet of wetland as long as no portion of log is within wetland).		
	Unit 23 No salvage activity downhill from the bluff by Swan River.		
	Unit 24 Salvage activity can occur at boat ramp area and any dangerous trees threatening the boat ramp area. Ground based equipment to remain on area already compacted by boat ramp users. SMZ alternative practices would be obtained prior to activity.		
	Unit 25 Salvage only bundled trees. Ground based equipment to remain on the road. SMZ alternative practices to be obtained prior to activity.		
	Unit 26 No salvage activity within 300 feet of Piper Creek.		
<b>Protect Fisheries Habitat (Proposed Action and Alternative C)</b>	No mechanical piling within the valley floors of Units 4, 6 and 8. Jackpot burning is allowed.	SA, FMO, FAFMO	Post Sale and During Harvest Activities

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TABLE 2-14.  
MANAGEMENT REQUIREMENTS AND DESIGN CRITERIA

OBJECTIVE	TASK	RESPONSIBILITY	DUE DATE
<b>Protect Fisheries Habitat (Alternative D)</b>	No salvage activity would be conducted within INFISH Riparian Habitat Conservation Areas (RHCAs). No activity within 300 feet of Lion Creek, Swan River, Piper Creek or Goat Creek. Unit 4, 6 and 8 may have 100 year floodplains that extend beyond 300 feet and if so, no activity within that floodplain. District Fish Biologist would mark boundary. No activity within 150 feet of Trickle Creek No activity within 100 feet of Tumble Creek No activity within 50 feet of wetlands less than 1 acre (one by unit 17, one by unit 18, three in unit 22. No activity within 150 feet of wetland greater than 1 acre (one by unit 18).	SA, SP, FMO, FAFMO, FISH	Pre - & Post - Harvest, During Harvest Activities
<b>Bull Trout Security</b>	In Units 3, 4, 6, 8, 10, 14 minimize disturbance and harassment to bull trout spawning. No salvage activity would occur from September 1 <sup>st</sup> to September 30 <sup>th</sup> .	SA, TP	During Harvest Activities
<b>Bull Trout Security</b>	Education materials would be provided to successful bidder(s) to remind them of fishing regulations that restrict bull trout harvest.	SA, FISH	Pre Harvest
<b>Forest Vegetation</b>	Prepare detailed site specific silvicultural prescription for all treatment areas requiring vegetation manipulation.	SILV	Prior to presale activities
<b>Forest Vegetation</b>	Consult with Project Silviculturist where treatment deviations are required during contract execution, as a result of changed or unidentified conditions that materially affect the intended treatment as described in the detailed site specific silvicultural prescription. As needed, the silvicultural prescription would be modified and re-approved by a certified Silviculturist.	SILV, TSA, SP, FMO	Pre, During, and Post Harvest Activities
<b>Forest Vegetation (Leave Tree Protection)</b>	Contractor would take all reasonable care to avoid damage to the roots, bole, and crown of trees to be reserved from cutting. No more than 5 percent of the trees designated to be reserved should be damaged beyond recovery by the Contractor's operations. Any tree damaged beyond recovery, (would die within one year due to damage), can be removed or otherwise treated by the Contractor as instructed by the Forest Service.	TP, TSA, SILV	Pre, During, and Post Harvest Activities
<b>Forest Vegetation (Leave Tree Protection)</b>	All hardwood trees would be reserved where feasible.	SILV, SA, TP, SP	Pre, During, and Post- harvest Activities

**TABLE 2-14.  
MANAGEMENT REQUIREMENTS AND DESIGN CRITERIA**

OBJECTIVE	TASK	RESPONSIBILITY	DUE DATE
<b>Forest Vegetation</b>	<p>To minimize potential effects from bark beetles apply the following:</p> <ul style="list-style-type: none"> <li>• If wind damaged trees are retained to meet CDW or snag requirements, avoid retention of bark beetle infested material as identified by visual signs such as pitch tubes and boring dust. Also, preference for retention is of less susceptible species (e.g. western larch)</li> <li>• Slash accumulations containing ponderosa pine slash should not be created prior to June (e.g. Unit 11) and will be treated prior to the spring following their creation.</li> <li>• If salvage of known infested material is not accomplished prior to emergence of adult beetles, consider alternative strategies (e.g. funnel traps)</li> </ul>	SILV, TSA, TP, SP	Pre-, During, and Post Harvest Activities
<b>Preserve TES Plant Populations and Their Habitats</b>	<p>If unknown populations of sensitive plants were found during project implementation, they would be evaluated and protected as necessary to retain population viability. A contract clause would incorporate this into any timber sale contract. This clause specifies that the contract would be modified to protect these plants if located.</p>	SILV, SA, TP, SP	Pre- & Post Sale & during Harvest Activities
<b>Preserve TES Plant Populations and Their Habitats</b>	<p>Avoid all wetlands with all ground-disturbing activities, including lakes, ponds, marshes, fens, and streams. Establish buffers around wetlands – 150 feet for areas greater than 1 acre and 50 feet for areas less than 1 acre. Buffers should begin where riparian vegetation ends.</p>	SP, SA, BT	Pre- & Post Sale & during Harvest Activities
<b>Control Spread and Reduce Potential spread of Noxious Weeds</b>	<p>Reestablish vegetation on bare ground created by road decommissioning or timber harvest activity. Seed landings, decommissioned roads, and roadsides with soil disturbance with a Montana-Certified grass ground cover (seed mix of native plants will be specified by the Forest Botanist), as soon as feasible after disturbance to provide for site projection until native species are established. Revegetation of bare soil is required under the authority of the R1 2080 Noxious Weed Management (April 2001).</p>	SA, BT, DRC	Post - Sale
<b>Control Spread and Reduce Potential spread of Noxious Weeds</b>	<p>Equipment use associated with timber harvest and road maintenance (excluding pickups and trucks used to remove forest products) would be power scrubbed or steam cleaned on the undercarriage and chassis before transport to the project area. This cleaning shall remove all soil, plant parts, seeds, vegetative matter, or other debris that could contain or hold seeds. All subsequent move-ins of equipment to the project area shall be treated in the same manner as the initial move in. "Off-road equipment" includes all logging and construction machinery, except for log trucks, chip vans, service vehicles, water trucks, pickup trucks, cars, and similar vehicles. During periods of operations with snow cover (10 inches minimum) or frozen ground, washing of equipment, as described above, is only required upon entering the project area and not when leaving the project area. During all other periods of activity without snow cover or frozen ground, washing of equipment as described above, is required before entering and upon leaving the project area. Contractors will be required to adhere to C6.351#-Washing Equipment, or similar contract provision which specifies the above washing criteria</p>	SA, TP	Pre-Harvest

Mid Swan Blowdown Salvage Environmental Assessment

Chapter 2

Alternatives Considered

**TABLE 2-14.  
MANAGEMENT REQUIREMENTS AND DESIGN CRITERIA**

OBJECTIVE	TASK	RESPONSIBILITY	DUE DATE
<b>Control Spread and Reduce Potential spread of Noxious Weeds</b>	Survey and monitor for weeds in all ground-disturbed areas in treatment units (slash piles, exposed soil from excavator tracks, skid trails), roads, and temporary roads. Monitoring will occur for at least 3 years following proposed action. Surveys and monitoring shall be conducted by the Forest Botanist, Botany Crew, Noxious Weed Specialist, or Weed Crew.	BT, NWM WC, BC	Post Sale
<b>Control Spread and Reduce Potential spread of Noxious Weeds</b>	Spray weeds along designated Forest Roads (prism) and disturbed areas. Existing roads within the project boundary would be identified for noxious weed treatment. Specific roads and mileage to be treated would be prepared in consultation with the Forest Weeds Coordinator. Road prism is the road and associated toe of the fill to the top of the cut slope, including the running surface and turnouts. However, when a contiguous patch of weeds extends beyond the road prism, it shall be treated (via force account or other means). Spraying of appropriate herbicides would occur pre and post haul, during the periods from June 1 to July 15 or September 1 to September 30. Pre and post haul treatment shall be the responsibility of the contractor and specified in contract clause C6.27#- Noxious Weed Treatment. Roads would be monitored for at least 3 years and future treatments would be prioritized and scheduled based on funding by the Forest Weeds Coordinator. Treatment of invasive plants would be consistent with the strategy outlined in the Noxious and Invasive Weed Control Environmental Assessment (March 2001).	NWM	Post Sale
<b>Control Spread and Reduce Potential spread of Noxious Weeds</b>	Rehabilitation and restoration of temporary roads would occur to discourage future access and create a vegetation community that would resist infestations. Maintaining or restoring the native plant population following disturbance may significantly reduce the potential for new weed establishments. When the use of the temporary or forwarder road is no longer needed for the project, soil would be pulled back over the road template, recontouring the road prism including all cut and fill slopes to the natural ground contour to the extent feasible. Revegetate with native shrubs or native seed mix (specified by the Forest Botanist) after topsoil is replaced as soon as feasible after disturbance to provide for site protection until native species are established. The first 100 feet where the temporary road meets a traveled road should be more heavily brushed and barriered with large woody debris to discourage the spread of weeds by unauthorized entry. Roads should be rehabbed as soon as access is no longer required, before the end of the project.	SA, DRC	Post Sale
<b>Control Spread and Reduce Potential spread of Noxious Weeds</b>	When feasible, where skid trails meet traveled roads skid trails should be brushed and barriered with large woody debris to discourage the spread of weeds by unauthorized entry.	SA, DRC	Post Sale
<b>Control Spread and Reduce Potential spread of Noxious Weeds</b>	The Noxious Weeds Manager or Forest Botanist would provide noxious weed informational materials of target species to sale administrators and contractor employees emphasizing the importance of spread prevention measures and communication of infestations to Forest personnel.	NWM, BT	Pre Sale
<b>Preserve Scenic Values in Units 18, 19, and 23</b>	Down trees that are harvested may pop back up once they are cut and may leave a higher than usual stump. Stumps that do this would be flush cut if seen from Highway 83.	SA, TP	Post Sale, During Harvest Activities