

APPENDIX C - EFFECTS OF ALTERNATIVE F-MODIFIED

Appendix C provides updated effects analysis for Alternative F-Modified for the following resource areas: (1) watershed; (2) geology and soils; (3) fisheries; (4) sensitive plants; (5) wildlife; and (6) economics. The resource areas not listed above will have the same or fewer effects as those described for Alternative F in the FEIS with Alternative F-Modified. Fewer effects result from the reduced activity specified in the decision and described in Appendix A. Additional discussion of cumulative effects of fire suppression activities is also included at the end of this Appendix.

WATERSHED

Watershed effects for Alternative F are discussed on FEIS pages 3-106 to 3-187. Following issuance of the FEIS, it was discovered that modeling for Alternatives E and F did not include the correct RHCA widths. Refer to the attached Errata that provides sediment modeling results to reflect the correct RHCA widths applied to Alternatives E and F.

Modifications were made to the fuel reduction activities in Alternative F to ensure the maintenance of water quality and support of beneficial uses in several watersheds. These modifications are summarized in “The Decision” section of this ROD and described in greater detail in Appendix A of the ROD.

Modifications were specified in five watersheds where cumulative effects with Alternative F are of concern. Cumulative effects concerns include past levels of harvest and road construction, activities on private land (both past, present and reasonably foreseeable), amount of fire and fire severity from the 2000 event, presence of bull trout and/or westslope cutthroat trout and the connectivity of these sensitive fish populations with other populations, and/or the occurrence of high intensity thunderstorms and debris flows during the summer of 2001. The following watersheds are included in the modifications to Alternative F: Laird Creek, Medicine Tree Creek, Robbins Gulch, Rye Creek and Little Sleeping Child Creek (FEIS, pages 3-186). The modifications and their effect upon these five watersheds are described below.

Laird, Medicine Tree and Robbins Gulch are part of the Lower East Fork HUC (0506 Hydrologic Unit). Due to cumulative effects concerns, stream channel conditions and the desire to maintain beneficial uses (FEIS, page 3-161 and 162), additional analysis was conducted for these drainages (and the ones discussed below) between the release of the FEIS and the decision. In Laird Creek and Robbins Gulch, some areas to be yarded using ground-based systems were changed to skyline or helicopter yarding. This resulted in lower estimated sediment yields because of less potential ground disturbance (PF-Watershed-60). This also reduced the risk to water quality likely to result from the implementation of Alternative F when combined with cumulative effects.

In Medicine Tree Creek, cumulative effects and existing stream channel conditions resulted in an increased risk to watershed health and water quality maintenance (FEIS, page 3-161). The presence of bull trout in this watershed further highlighted this concern. To reduce risk from sediment yield increases, several harvest units were dropped, ground-based yarding units were converted to skyline or helicopter, and stream buffer widths were widened. This resulted in lower sediment yields (PF-Watershed-60) and lowered risk to fish populations and water quality decreases. Because this resulted in a large reduction in treated acres in this watershed and affected the feasibility of the project in Medicine Tree Creek, all harvest in this drainage was dropped in Alternative F-Modified.

Eliminating the fuel reduction activities in the Medicine Tree Creek drainage will reduce sediment yield estimates in the Lower East Fork slightly by eliminating those short-term sediment yields associated with harvest, landings, and temporary roads. This will also reduce sediment contributed to the main stem of the East Fork of the Bitterroot River, Lower East Fork HUC, 0506 (PF-Watershed-60).

In Rye Creek, a bull trout population, cumulative effects and estimated sediment yields from proposed activities resulted in concern for watershed health, water quality, stream channel conditions and fish populations (FEIS, pages 3-125-126). Conversion of ground based yarding to helicopter yarding in much of Alternative F resulted in sediment yield estimates that were near to Alternative E (which are considerably lower than FEIS Alternative F) (PF-Watershed-60) and will protect water quality as well as the fish populations (see the following Fisheries analysis).

Little Sleeping Child Creek was another watershed where cumulative effects (FEIS, page 2-127) resulted in an increased risk to stream channel changes when combined with the sediment yields estimated to result from Alternative F. Alternative F-Modified requires all harvest in this drainage to be done using helicopter, except 130 acres of skyline yarding or 65 acres of ground based skidding. With these changes, model estimates resulted in lower sediment yield (PF-Watershed-60) compared to Alternative F and maintains beneficial uses (fish and water quality).

Table C-1- Sediment Yield Estimates Resulting from Modifications to Alternative F

Watershed Name, HUC	Alternative F with Correct INFISH Buffers, tons/year	Modified Alternative F, tons/year
Rye Creek, 0801	408.1	208.1
Little Sleeping Child, 0704	224.6	65.5
Lower East Fork, 0506	564.6	427.4

Additional consultation with the Environmental Protection Agency (EPA) also occurred between the FEIS and the selection of Alternative F-Modified. This consultation and review of the FEIS and modifications to Alternative F address the concerns that the EPA had related to the Burned Area Recovery Project (PF-Agency-24). The modifications that addressed the concerns of the EPA are described below:

- Elimination of live tree harvest in watersheds where increases in water yields were a concern.
- Reduction of area treated by fuel reduction of modification of yarding methods to protect water quality and fisheries.
- Increased width of INFISH buffers.
- Old growth harvest eliminated.
- Green tree thinning avoided in sensitive wildlife habitats.
- Management of prescribed fire to address public health and welfare.
- Alternative F Watershed Improvements as described in FEIS.
- An in-depth soils, water and fisheries monitoring plan is included with the FEIS (see also Project File document 62).

The in-depth soils, water and fisheries monitoring plan goes beyond monitoring associated with mitigation identified and would monitor the effects of the post-fire recovery activities on soil, water quality and aquatic values. Aquatic monitoring focuses on stream channel conditions, fish populations and soil conditions as a result of the implementation of fuel reduction activities and watershed improvements.

Additional consultation also occurred with Montana Department of Environmental Quality (DEQ) between the release of the FEIS and the decision to implement Alternative F-Modified. The DEQ has found that Alternative F-Modified complies with Montana Water Quality Act (PF- FEIS Correspondence-14).

Forest Plan Consistency:

As a result of the modifications to Alternative F in the Lower East Fork (0506), Rye Creek (0801) and Little Sleeping Child (0704), consultation with EPA and DEQ, and the additional sediment yield analysis that occurred between the FEIS and the decision, Alternative F-Modified is consistent with the Forest Plan. Stream channel conditions will be maintained in the short-term by project design and mitigation requirements and will be improved in the long-term by reducing road sediment sources throughout the analysis area.

GEOLOGY AND SOILS

Alternative F is analyzed in detail in the FEIS on pages 3-207 to 3-210.

Alternative F-Modified is summarized in “The Decision” section of this ROD, and described in greater detail in Appendix A of the ROD. Alternative F-Modified differs from Alternative F in that a number of ground-based harvest units have been dropped or changed to helicopter yarding in order to reduce impacts on watersheds. Based on these modifications to Alternative F, the following narratives update the effects analysis for soils.

Soil Productivity

The direct and indirect effects of Alternative F-Modified will be similar to Alternative F, except 7 miles of temporary road would be built, about one mile less than Alternative F. Alternative F-Modified will apply the same soil protection mitigation measures as Alternative F.

Nutrient Cycling

Nutrient cycling effects are the same as those described for Alternative F except Alternative F-Modified reduces fuels on 9,058 acres with fuel loads in excess of 50 tons/acre. This is 541 acres fewer than Alternative F.

Soil Erosion

Soil erosion effects are the same as Alternative F. In both cases, 31% of the area with severely burned soils will have fine and coarse woody debris distributed on the soil surface to provide effective ground cover.

Soil Compaction and Displacement

Alternative F-Modified, like Alternative F, avoids the potential for soil damage on severely burned soils by eliminating a second entry from excavator piling of fuels, and requires that skyline logging occurs in winter for units with high erosion hazard. Table C-2 summarizes the acres of fuel reduction by alternative and reflects the changes in logging systems in Alternative F-Modified.

Table C-2- Net Acres of Proposed Fuel Reduction Treatment by Alternative

Method	Alt. B	Alt. D	Alt. E	Alt. F	F-MOD	Alt. G
Helicopter	33,405	33,088	11,471	23,180	26,398	0
Skyline	10,633	11,397	3,831 ¹	9,952	8,379 ³	26 ²
Tractor/Winter	7,705	7,815	3,239	7,634	4,981	79 ²
Tractor/Summer	0	238	0	482	382	0
Track-line machine	0	98	0	973	665 ³	
Total	51,743	52,637	18,541	42,221	40,805	105

¹Winter conditions only for skyline in Alternative E

²Mechanized fuel reduction for research purposes

³Winter conditions only for 1,773 acres of skyline and track-line machine

The acres with past impacts will be similar to Alternative F, with the exception that Alternative F reenters 178 acres of land previously logged with ground based equipment, and Alternative F-Modified F reenters 112 acres.

In accordance with the R-1 Soil Quality Standards, new activities are designed so that no more than 15% of an activity area will be detrimentally impacted. Table 3-50 of the FEIS (FEIS pg 3-203) lists the anticipated range of disturbance as varying from 1-10%. However, the mitigation measures that have been included are expected to limit the detrimental disturbance to the lower end of this range and Soil Quality Standards will be achieved. Soil disturbance is modeled by WEPP as a reduction in ground cover (less ground cover means that more area can be eroded). The maximum amount of ground cover reduction modeled was 10% and this was for tractor yarding during winter conditions and was considered to be very conservative and was based upon literature review and professional judgment (FEIS 3-303, PF-Watershed-41, page 3). A conservative approach was used in order to err on the side of resource protection. Soils monitoring, FEIS page C-6 and 7, describe the implementation monitoring that will take place where ground based activities occur. This monitoring will document the amount of ground disturbance that may take place during winter ground based yarding and would serve as a monitoring tool to document the amount of ground disturbance and/or reduction in ground cover that does take place during implementation of winter ground based activities.

FISHERIES

Alternative F is analyzed in detail in the FEIS on pages 3-262 to 3-266 (Skalkaho-Rye Geographic Area) and pages 3-295 to 3-299 (East Fork Geographic Area).

Alternative F-Modified is summarized in “The Decision” section of the ROD, and described in greater detail in Appendix.

Based on these modifications to Alternative F, the following narratives update the effects analysis for fisheries in five drainages: (1) Medicine Tree; (2) Little Sleeping Child; (3) Rye/North Rye; (4) Laird; and (5) Robbins Gulch.

The original Alternative F poses a risk to the persistence of the fire and mudslide-damaged westslope cutthroat trout populations that are present in Medicine Tree, Little Sleeping Child, North Rye, and lower Rye Creeks (FEIS pgs 3-266, 3-274, 3-275, 3-299, 3-306, and 3-308). The reason for the risk is that short-term sediment increases from Alternative F could be high enough to combine with high sediment inputs from the fires and mudslides to significantly reduce survivorship in multiple (2002-05) spawning year-classes of fish. At their current low levels following the fires and mudslides, these populations may not be able to absorb large reductions in multiple year-classes without jeopardizing their long-term recovery and persistence. Isolation is another important factor that hinders the recovery of the small westslope cutthroat trout populations in Medicine Tree and Little Sleeping Child Creeks, and puts these populations at a higher risk of extinction (FEIS pgs 3-266, 3-274, and 3-275 = Little Sleeping Child Creek; FEIS pgs 3-299, 3-306, and 3-

308 = Medicine Tree Creek). Replacement by brook trout is another threat to the long-term persistence of damaged westslope cutthroat trout populations in Little Sleeping Child, North Rye, and lower Rye Creeks (FEIS pg 3-266).

Alternative F was modified in the Medicine Tree, Little Sleeping Child, North Rye, and Rye Creek drainages to reduce short-term sediment increases down to levels that are unlikely to threaten the recovery and persistence of the westslope cutthroat trout populations. Additional modification also occurred in the Laird Creek and Robbins Gulch drainages for watershed health concerns, although persistence of fish populations was not identified in the FEIS as being a significant threat in these two drainages (FEIS pgs 3-299, 3-306, and 3-308). Laird Creek maintains a year-round connection to the East Fork of the Bitterroot River, which is expected to enhance and speed the recovery of its damaged native trout populations following the fires and mudslides (FEIS pg 3-299). Robbins Gulch is a small stream that does not support a fishery, and it contributes a very minimal amount of sediment and water to fish habitat in the East Fork of the Bitterroot River.

In the Medicine Tree Creek drainage, planting and watershed improvements are the only activities that will occur in Alternative F-Modified. In the long-term, these activities will improve watershed health and benefit habitat for the small, isolated westslope cutthroat trout population in that drainage. Alternative F-Modified will have an insignificant effect on bull trout because bull trout are not present in the Medicine Tree Creek drainage, and the planting and watershed improvement activities will have an insignificant effect on habitat in the East Fork of the Bitterroot River. As described in the bull trout Biological Assessment (BA), Medicine Tree Creek contributes only a small amount of sediment and water to bull trout habitat in the East Fork of the Bitterroot River because of the trapping and settling effect caused by a plugged culvert under U.S. Highway 93. Little of the sediment produced in the Medicine Tree Creek drainage enters the East Fork. For those reasons, Alternative F-Modified will have an insignificant effect on bull trout in the lower East Fork drainage. The cumulative effect on bull trout in the East Fork will remain the same as that described for Alternative F in the FEIS (pgs 3-298 to 3-299) and bull trout BA (PF, FISH-22).

In Little Sleeping Child Creek, the modifications to Alternative F are predicted to reduce sediment delivery to westslope cutthroat trout habitat by about 70% as compared to Alternative F. Buffer widths will remain the same as those of Alternative F. The modifications are likely to substantially reduce sediment impacts on the 2002-05 year classes of westslope cutthroat trout. Assuming that all of the harvest and watershed improvement activities are completed by winter 2003-04, reductions are still likely to occur in the 2002-05 year classes, but the losses will be lighter and more widely scattered than those described in the FEIS (FEIS page 3-264). The cumulative effect is likely to be a slower recovery of the westslope cutthroat trout population during the 2002-05 time period relative to that which would occur with no action. However, because of the reduced sediment inputs, year class reductions in 2002-05 will be much less likely to cause long-term damage to the population. In the long-term, the persistence of the westslope cutthroat trout population in Little Sleeping Child Creek is unlikely to be threatened by Alternative F-Modified. Alternative F-Modified will have no effect on bull trout in the Sleeping Child Creek drainage because bull trout are not present in Little Sleeping Child Creek, and the sediment produced by the project is unlikely to be transported downstream into bull trout habitat in lower Sleeping Child Creek. The old DNRC dam and reservoir located on private land near the Forest boundary is likely to trap the vast majority of the sediment that will be produced in the Little Sleeping Child Creek drainage. For those reasons, the sediment reductions that will occur as a result of Alternative F-Modified are likely to have an insignificant effect on bull trout in the Sleeping Child Creek drainage. The cumulative effect on bull trout in the Sleeping Child Creek drainage will remain the same as that described for Alternative F in the FEIS (pgs 3-264 to 3-266) and bull trout BA (PF, FISH-22).

In North Rye and lower Rye Creeks, Alternative F-Modified will produce short-term sediment increases similar to those of Alternative E. Therefore, the effects of Alternative F-Modified and Alternative E (FEIS pgs 3-268 to 3-271) are likely to be indistinguishable. With Alternative F-Modified, no harvest will occur in the portion of the Rye Creek drainage that contains bull trout. The cumulative effect on bull trout in the Rye Creek drainage will remain the same as that described for Alternative F in the bull trout BA (PF, FISH-22).

In Laird Creek, the modifications to Alternative F are predicted to reduce sediment delivery to Laird Creek and its tributaries by about 10-20%. To a small degree, these sediment reductions are likely to reduce impacts on the 2002-06 year classes of bull trout and westslope cutthroat trout as described in the FEIS (pgs 3-297 to 3-299) and bull trout BA (PF, FISH-22). Assuming that all of the harvest and watershed improvement activities are completed by winter 2003-04, reductions are still likely to occur in the 2002-06 year classes, but the losses will be smaller than those described in the FEIS (pg 3-296). In either case, the persistence of the bull trout and westslope cutthroat trout populations in Laird Creek is unlikely to be threatened by original Alternative F (FEIS pg 3-299) or Alternative F-Modified. A key factor in the recolonization of Laird Creek by bull trout and westslope cutthroat trout is its year-round connectivity to the East Fork of the Bitterroot River (FEIS pg 3-299). This connectivity is expected to enhance and speed the recovery of Laird Creek's damaged native trout populations following the fires and mudslides.

Robbins Gulch is a very small stream that does not support fish and contributes only a small amount of sediment and water to bull trout and westslope cutthroat trout habitat in the East Fork of the Bitterroot River. For those reasons, the sediment reductions that will occur with Alternative F-Modified will have an insignificant effect on bull trout and westslope cutthroat trout in the East Fork of the Bitterroot River. The cumulative effect on bull trout and westslope cutthroat trout in the East Fork will remain the same as that described in the FEIS (pg 3-298 to 3-299) and bull trout BA (PF, FISH-22).

Forest Plan Consistency

In all streams, Alternative F-Modified will be consistent with the Forest Plan as amended by INFISH because it is unlikely to hinder the attainment of the Riparian Management Objectives (RMOs) or adversely affect native trout populations in the long-term. During the 2002-05 time period, sediment is likely to degrade the pool frequency RMO in the streams mentioned above through small reductions in pool depth/volume. Starting in 2006 and continuing into the future, the pool frequency RMO is likely to be maintained as the project-caused sediment gets routed out of the affected pools and annual sediment reductions commence from the road network. The large woody debris RMO will be maintained in all streams because potential debris will not be removed from contributing areas (stream buffers and landslide-prone areas). The water temperature RMO will be maintained because stream and/or wetland shading will be protected (stream buffers), and measurable increases in temperatures are unlikely to occur in any stream as a result of harvest activities. Where incremental water temperature increases do occur, the watershed improvement activities (culvert replacements and/or removals) will be responsible for temperature increases, and these increases will be temporary (i.e. lasting 5-10 years until riparian shade returns to road stream crossings). In the long-term, the shade provided by a natural riparian canopy will be much more beneficial to native trout than the shade provided by a culvert. The width-to-depth ratio RMO will be maintained because the short-term sediment and peak/base flow increases are unlikely to occur on a large enough scale to cause measurable stream channel widening.

In Little Sleeping Child, Laird, Rye, and North Rye Creeks, Alternative F-Modified is likely to have a negative affect on bull trout (Laird only) and westslope cutthroat trout (all four streams) habitat and populations during the 2002-05 time period through reductions in year class survivorship and temporary reductions in the quality of spawning and rearing habitat due to cumulative sediment accumulations. Starting in 2006 and continuing into the future, bull trout and westslope cutthroat trout habitat and populations are expected to rebound from these short-term habitat reductions as fire-caused erosion and sediment yields return to pre-fire levels and project-caused sediment reductions from the road network commence.

In the other streams in the project area, effects on bull trout and westslope cutthroat trout habitat and populations will be unchanged from those described in the FEIS (FEIS pgs 3-220 to 3-228, 3-241 to 3-243, 3-244, 3-262 to 3-266, 3-274, 3-275, 3-295 to 3-299, 3-306 to 3-308, 3-330 to 3-332, 3-335 to 3-336) and the bull trout BA (PF, FISH-22).

Changes to the Westslope Cutthroat Trout Biological Evaluations

In the Blodgett and West Fork Geographic Areas, the Biological Evaluations for westslope cutthroat trout in the Project File (PF, FISH-23) and in the FEIS have the same determination of effects for Alternative F-Modified and Alternative F (Blodgett = FEIS pg 3-244; West Fork = FEIS pg 3-335). The determination for Alternative F-Modified in the Blodgett and West Fork Geographic Areas is “*may impact individuals or habitat, but will not likely result in a trend toward federal listing or reduced viability for the population or species*”. Modifications to Alternative F did not affect fish habitat or populations in the Blodgett and West Fork Geographic Areas.

In the Skalkaho-Rye and East Fork Geographic Areas, the Biological Evaluations for westslope cutthroat trout are updated to reflect the lesser effects that will occur with Alternative F-Modified. With Alternative F-Modified, the determination of effect on westslope cutthroat trout in the Skalkaho-Rye and East Fork Geographic Areas will be “*may impact individuals or habitat, but will not likely result in a trend toward federal listing or reduced viability for the population or species*”. The reasons for the change in determinations are:

- reduced short-term sediment increases relative to the original Alternative F
- improved survivorship is likely to occur in the 2002-05 year classes, and
- Alternative F-Modified is unlikely to threaten westslope cutthroat trout population persistence in the long-term in all of the affected streams.

Table C-3 updates the Biological Evaluation tables in the FEIS (Blodgett = FEIS pg 3-244; Skalkaho-Rye = FEIS pg 3-274; East Fork = FEIS pg 3-307; West Fork = FEIS pg 3-335).

WESTSLOPE CUTTHROAT TROUT BIOLOGICAL EVALUATION
SUMMARY OF CONCLUSION OF EFFECTS
Burned Area Recovery FEIS

Table C-3 Addendum to the FEIS and Project File Biological Evaluations

GEOGRAPHIC AREA	ALT A	ALT B	ALT C	ALT D	ALT E	ALT F	ALT G	ALT F MOD
Blodgett	MIIH							
Skalkaho-Rye	MIIH	LIFV*	MIIH	LIFV*	LIFV*	LIFV*	MIIH	MIIH
East Fork	MIIH	LIFV*	MIIH	LIFV*	LIFV*	LIFV*	MIIH	MIIH
West Fork	MIIH							

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Date: November 16, 2001

***Trigger for a Significant Action:**

NI = No Impact

MIIH = May Impact Individuals or Habitat, but Will Not Likely Result in a Trend Toward Federal Listing or Reduced Viability for the Population or Species

LIFV* = Likely To Impact Individuals or Habitat with a Consequence that the Action may Contribute Towards Federal Listing or Result in Reduced Viability for the Population or Species

BI = Beneficial Impact

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WILDLIFE

Wildlife effects of implementing any of the proposed alternatives are analyzed in detail in the FEIS from pages 3-485 to 3-563. The analysis includes effects of Alternative F, which has been modified in the decision. Modifications are summarized in “The Decision” section of the ROD and documented in detail in Appendix A.

As a result of modifications to Alternative F, Alternative F-Modified will have the following differences in effects on wildlife:

Effects on elk populations will not change since none of the Alternatives analyzed will have a short-term effect as documented on pages 3-486 and 3-487 of the FEIS. There will be no change in effect on elk winter range thermal cover because prescribed treatments will not change in winter range units, and areas withdrawn from harvest are either not thermal cover or not in winter range (FEIS p 3-487 to 3-491). The changes will not affect Elk Habitat Effectiveness (FEIS p 3-491 to 3-493) because no road management changes were made. Elk hunting season security will not be affected by the changes between Alternative F and Alternative F-Modified because none of the changes result in more cover available more than one-half mile from and open road (FEIS p 3-494 to 3-497). Pine marten habitat effects will not change because most of the burned area is now unsuitable habitat (FEIS 3-497 to 3-501) and reforestation objectives and coarse woody debris guidelines for treated units will not change. Since prescribed treatments are unlikely to affect Pileated Woodpecker populations (FEIS p 3-501 to 3-502) there will be no changes in effects on this species. Old growth habitat effects will not change because no harvest is prescribed in remaining old growth in either Alternative F (FEIS 3-505) or Alternative F-Modified. Changes between Alternative F and Alternative F-Modified will not change effects on forest land birds because the same mitigation measures relative to their needs are a part of both alternatives. There will be no difference in effects in animal movement, migration or dispersal for the same reasons stated in the FEIS (p.3-510). Effects on habitat fragmentation will remain the same as documented in the FEIS (p. 3-512). As a result of eliminating about 1,500 from treatment, more snags will be retained. This is unlikely to cause any significant benefit or impact because the scope of the change is so small compared to either the treatment areas or the 85 percent of the burned area that will not be treated. Effects on amphibians and reptiles will be the same as described on FEIS pages 3-515 to 3-517.

Biological assessments for threatened, endangered and sensitive wildlife will result in the same conclusion for all the species as described on pages 3-562 and 3-563. None of the species viability will be jeopardized by implementation of Alternative F-Modified.

SENSITIVE PLANTS

Activities in Alternative F-Modified may impact a few individual sensitive plants or their habitat but will not likely result in a trend toward federal listing or reduced viability for any sensitive plant population. Alternative F-Modified drops a temporary road in the Robbins Gulch drainage that would have resulted in a likely to impact Lemhi penstemon habitat with a consequence that the action may have resulted in reduced viability for the Robbins Gulch Lemhi penstemon population. Additionally, the boundary of unit 218 was adjusted to exclude two of seven subpopulations of Lemhi penstemon found within areas of proposed activities in Robbins Gulch. One of these subpopulations is the largest found in the area and a permanent monitoring plot was established at the site this fall to monitor impacts of the 2000 burn, spotted knapweed competition, and indirect impact from the adjacent harvest activities. The other five subpopulations are located in areas where helicopter or winter harvest activities would occur, thereby minimizing impacts on Lemhi penstemon plants or habitat. It was expected that the fires of 2000 would have a beneficial effect on Lemhi penstemon populations through seedbank recruitment (Heidel and Shelly, 2001). When establishing the above monitoring plot in Robbins Gulch many new seedlings were noted in addition to resprouting from established root crowns, indicating a positive response to the fire, at least after the first year.

The Biological Evaluations found in the Project File and in the FEIS have the same conclusion of effects for Alternative F-Modified as for Alternative F, except for the Lemhi penstemon population in Robbins Gulch (East Fork Geographic Area). An addendum to the East Fork Area Biological Evaluation is provided below to document the changed effects.

**SENSITIVE PLANT SPECIES BIOLOGICAL EVALUATION
SUMMARY OF CONCLUSION OF EFFECTS**

Table C-4 Addendum to the East Fork Area Biological Evaluation

SPECIES	ALT A	ALT B	ALT C	ALT D	ALT E	ALT F	ALT G	ALT F MOD
taper tip onion <i>Allium acuminatum</i>	MIH							
dwarf onion <i>Allium parvum</i>	MIH							
candystick <i>Allotropa virgata</i>	MIH	MIH	MIH	LIFV*	MIH	MIH	MIH	MIH
western boneset <i>Eupatorium occidentale</i>	NI							
turkey-peas <i>Orogenia fusiformis</i>	MIH							
Lemhi penstemon <i>Penstemon lemhiensis</i>	MIH	MIH	MIH	LIFV*	MIH	LIFV*	MIH	MIH**
woollyhead clover <i>Trifolium eriocephalum</i> <i>ssp. arcuatum</i>	MIH							
hollyleaf clover <i>Trifolium gymnocarpon</i>	MIH							

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Date: October 23, 2001

***Trigger for a Significant Action:** 1) The cumulative effects of temporary road construction in Alt. D with past activities in the Tolan Creek drainage warrants the “likely to impact habitat resulting in reduced viability for the Tolan Creek candystick population”. 2) The cumulative effects of temporary road construction in Alt. D with past activities in the Robbins Gulch drainage warrants the “likely to impact habitat resulting in reduced viability for the Robbins Gulch Lemhi penstemon population”.

****Addendum Notes:** This is an addendum to the East Fork Area Biological Evaluation included with the Burned Area Recovery FEIS. The temporary road originally included in Alternative F in the Robbins Gulch drainage was determined to be unnecessary for implementation. In addition, two of the known Lemhi penstemon populations were excluded from proposed activities in unit 218. Eliminating the temporary road will reduce cumulative impacts on Lemhi penstemon habitat and amend the determination of effects from “likely to impact habitat resulting in reduced viability for the Robbins Gulch Lemhi penstemon population” to “may impact habitat, but will not likely result in a trend toward reduced viability for the Robbins Gulch Lemhi penstemon population”. All other determination of effects on sensitive plant species in the East Fork Geographic Area will remain as described in the FEIS.

NI = No Impact

MIH = May Impact Individuals or Habitat, but Will Not Likely Result in a Trend Toward Federal Listing or Reduced Viability for the Population or Species

LIFV* = Likely To Impact Individuals or Habitat with a Consequence that the Action may Contribute Towards Federal Listing or Result in Reduced Viability for the Population or Species

BI = Beneficial Impact

Form 2 (R-1-2670-95)

ECONOMICS

Alternative F is analyzed in detail in the FEIS on pages 3-686 to 3-690. Alternative F-Modified is summarized in “The Decision” section of this ROD, and described in greater detail in Appendix A of the ROD.

The cost per acre for fuel treatment has increased from \$6/acre in Alternative F to \$82/acre in Alternative F-Modified. The reason for this increase is the switch of about 3,200 acres of ground-based logging systems to helicopter logging. In addition 1,400 acres of harvest that generated revenue in Alternative F will not be done. These changes provide additional protection for the soil, water, and fisheries resources in five sensitive drainages (Medicine Tree; Laird; Robbins

Gulch; Rye; Little Sleeping Child), but increases harvest costs. Table C-5 and Table C-6 summarize the PNV and the proportion of harvest by logging system for each alternative. The higher cost of fuel treatment in Alternative F-Modified is directly tied to protection for other resources and amounts to a total change in PNV of \$3,700,000 for the nine sales in the five sensitive drainages. The estimated reduction in sale revenue from those sales is \$3,950,000.

Table C-5– Fuel Treatment Costs, PNV/acre by Alternative

Alternative	A	B	C	D	E	F	F-Mod	G
Acres Treated	0	58,964	0	59,893	19,831	46,239	43,702	9,223
PNV/Acre	N/A	\$82	N/A	\$69	\$46	\$6	\$82	\$804

Table C-6– Proportion of Harvest by Logging System

Alternative	A	B	C	D	E	F	F-Mod	G
Tractor	N/A	13%	N/A	14%	16%	16%	10%	75%
Skyline	N/A	22%	N/A	23%	21%	29%	25%	25%
Helicopter	N/A	64%	N/A	64%	63%	55%	65%	0%

The estimated impact of a delay of one year in getting the salvage sales under contract is:

- Sale revenue would decrease by \$10,968,000. This means that the project would go from a net positive revenue of \$2,963,000 from the harvest contracts, to a net payment required of \$8,005,000 to get all of the acres treated with harvest.

The PNV of the harvest activity would decrease by \$10,546,000, and the total cost of the alternative would increase by the same amount

Alternative F-Modified triggered changes in acres harvested, volume harvested, sale revenue, and Present Net Value (PNV). Table 3-95 of the FEIS has been updated to present similar information for Alternative F-Modified, and is provided below in Table C-7.

Table C-7– Economic Efficiency and Economic Impacts by Alternative

	A	B	C	D	E	F	F-MOD	G
ECONOMIC EFFICIENCY								
Non-Harvest Fuel Treatment								
Acres	0	7217	0	7002	1290	3866	2897	9118
PNV (\$000)	0	-\$5,879	0	-\$5,740	-\$1,102	-\$3,265	-\$3,265	-\$7,404
Harvest and Fuel Treatment								
Acres	0	51,747	0	52,891	18,541	42,373	40,805	105
PNV (\$000)*	0	\$1,042 to \$1,326	0	\$1,580 to \$1,896	\$196 to \$283	\$2,975 to \$3,307	-\$539 to -\$397	-\$11
Volume Harvested (MMBF)	0	235	0	240	79	181	176	0.5
Net Stewardship Contract Revenue **(\$000)	0	\$5,624 to \$5,921	0	\$6,254 to \$6,583	\$1,714 to \$1,804	\$6,566 to \$6,912	\$2,814 to \$2,963	0
Reforestation, Prescriptions, Exams and Thinning								
Acres	0	42,888	36,259	43,990	22,585	42,444	42,444	4,167
PNV (\$000)	0	-\$9,748	-\$12,284	-\$9,827	-\$6,055	-\$10,060	-\$10,060	-\$1,412
Fisheries Habitat Improvement PNV (\$000)	0	-\$298	-\$298	-\$298	-\$298	-\$298	-\$298	-\$298
NEPA – EIS Preparation PNV (\$000)	-\$960	-\$960	-\$960	-\$960	-\$960	-\$960	-\$960	-\$960
Road Restoration PNV (\$000)	0	-\$4,672	-\$4,872	-\$5,017	-\$4,872	-\$5,041	-\$5,041	-\$9,365
Weed Prevention PNV (\$000)	0	-\$274	0	-\$280	-\$124	-\$249	-\$249	-\$2,892
Forest Fuels Monitoring PNV (\$000)	0	-\$27	0	-\$27	-\$8	-\$21	-\$21	-\$4
Log Erosion Barriers PNV (\$000)	0	0	0	0	0	0	0	-\$282
Homeowner Protection & Education PNV (\$000)	0	0	0	0	0	0	0	-\$905
ALTERNATIVE TOTAL PNV (\$000)	-\$960	-\$20,816 to -\$20,532	-\$18,414	-\$20,569 to -\$20,253	-\$13,233 to -\$13,136	-\$16,919 to -\$16,587	-\$20,433 to -\$20,291	-\$23,533
ECONOMIC IMPACTS								
Employment (Jobs)								
Forest Service Employment	16	223	70	224	91	168	166	201
Private Sector Employment	0	4,855	1,019	4,947	1,883	3,929	3,846	620
TOTAL EMPLOYMENT	16	5,078	1,089	5,171	1,974	4,097	4,012	821
Employee Compensation (\$000)								
Forest Service Employee Compensation	252	3,542	1,107	3,555	1,444	2,659	2,634	3,190
Private Sector Employee Compensation	0	95,598	7,111	97,611	34,313	75,062	73,170	5,709
TOTAL EMPLOYEE COMPENSATION	252	99,140	8,217	101,165	35,756	77,720	75,804	8,900

*=a range of values is shown because of potential reduction in stumpage prices resulting from the volume of sawtimber this EIS would put on the market

**=Net Stewardship Contract Revenue is the sum of the net revenues for all individual sales, some of which are positive and some are negative. A sale with negative revenue indicates that a service contract would have to be used to pay for removal of sawtimber to meet sale area objectives.

ADDITIONAL CUMULATIVE EFFECTS OF FIRE SUPPRESSION ACTIVITIES

The direct and indirect effects of dozer line, hand line, retardant drops, and BAER activities on aquatic resources are addressed in the FEIS on pages 3-237 to 3-238 (Blodgett Geographic Area), 3-256 to 3-257 (Skalkaho-Rye Geographic Area), 3-289 to 3-290 (East Fork Geographic Area), and 3-320 (West Fork Geographic Area). These suppression activities were considered in the cumulative effects analysis for fisheries and watershed in the FEIS.

In addition to dozer line, hand line, retardant drops, and BAER activities, there were six helispots (four in the Skalkaho-Rye Geographic Area; two in the West Fork Geographic Area), about 100 drop points (scattered across all Geographic Areas), seven constructed safety zones (all in the East Fork Geographic Area), and 12 natural safety zones (six in the Blodgett Geographic Area; five in the Skalkaho-Rye Geographic Area; one in the West Fork Geographic Area) that were used during the suppression effort. These features are mapped in the project file (PF, MAP-227, MAP-228, MAP-229, MAP-230).

Five of the six helispots were natural openings and meadows on mountaintops, or upper elevation bare saddles and ridges. No soil disturbance or erosion occurred from the use of the helispots. On the Little Blue Fire, one helispot was widened (by felling trees around the perimeter) by less than one acre on a severely burned ridge in the upper Fork Creek drainage (small tributary to Blue Joint Creek) in order to conduct an emergency air evacuation of a firefighter suffering from dehydration and heat exhaustion (see PF, MAP-227). There was no significant soil disturbance or erosion that occurred as a result of the widening. A fisheries biologist inspected the site after construction. Negative impacts to soils and aquatic resources were not observed. The site was located several thousand feet from the nearest stream. Typically, helispots were pre-identified before any tactical actions were executed to ensure safe firefighting practices.

Drop points are usually associated with man-made features, such as road junctions, turnouts, fields, or addresses along a road. None of the roughly 100 drop points that were used during the 2000 suppression effort required soil disturbance or clearing by heavy equipment. The vast majority of drop points was already disturbed and/or hardened sites that required essentially no rehabilitation following their use. Drop points generally were not located in or near RHCAs, unless they consisted of road junctions and/or turnouts. In summary, drop points had an insignificant effect on aquatic resources. They did not remove any riparian vegetation or shade on streams, and contributed essentially no sediment to streams.

A total of seven safety zones were constructed in 2000. All of these were located in the East Fork Geographic Area in the Mink Creek drainage and along the ridge between Mink, Tolan, and Meadow Creeks, particularly near the Hilltop area (see PF, MAP-229). The total area of forest that was cleared for these safety zones was less than 20 acres. The largest safety zone was about five acres in area, and was located at Mink Creek saddle (junction of Roads 5753 and 13343). The other six were small, generally ranging between half an acre and two acres. The cleared forest consisted of mixed Douglas fir, lodgepole pine, and subalpine fir. In the majority of cases, the clearings occurred around road junctions. With the exception of a two acre safety zone that was constructed near an intermittent, non-fish bearing tributary to the East Fork (see monitoring photo-point #12 in PF, FISH-17), the rest of the safety zones were located along upper elevation saddles and road junctions several thousand feet from the nearest stream. All of the constructed safety zones were rehabilitated with an excavator and hand crews following their use. Rehabilitation consisted of recontouring the soil prism, scattering slash across the disturbed area, fertilizing, and seeding the disturbed area with grass. The same seed mix was used on dozer lines and safety zones. With the exception of the two-acre safety zone in the intermittent draw, most of the rehabilitated safety zones did not grow grass as well as the rehabilitated dozer lines did in 2001. One reason may be their shorter growing season at higher elevations. Because of their location, the six ridgetop safety zones have had no effect on aquatic resources. Monitoring in summer 2000 and 2001 did not detect any sediment entering the intermittent tributary to the East Fork. The main reason is that the disturbed area was flat, the disturbed area did not approach within 50 feet of the draw, there was an excellent filter of thick riparian vegetation between the disturbed area and the draw, and there was no water in the draw.

In addition to the seven constructed safety zones in the East Fork Geographic Area, twelve natural meadows were used as safety zones across all of the geographic areas. There was no heavy equipment clearing or soil disturbance at these sites.

Minimum Impact Suppression Tactics were used when locating helispots, drop points, and safety zones to keep soil disturbance to a minimum. In the vast majority of cases, riparian areas were avoided unless no other options existed.

For all of the reasons discussed above, helispots, drop points, and safety zones have had insignificant direct and indirect effects on fisheries and aquatic resources. The total contribution of sediment from helispots, drop points, and safety zones, from the fires and other activities has been minimal, and in the vast majority of cases, nonexistent. When

combined with sediment from past activities (including other 2000 fire suppression activities), the fires and mudslides, and reasonably foreseeable future activities, helispots, drop points, and safety zones are likely to contribute miniscule quantities of sediment, and have an insignificant effect on water quality and fish habitat.

As discussed in the sensitive plants cumulative effects section of the FEIS (FEIS pg 3-469 to 3-470, 3-474 to 3-475, 3-478 to 3-480, 3-483 to 3-484), past activities on the Forest have likely contributed to the introduction and spread of noxious weeds. At least a portion of this weed spread could have been controlled if weed prevention measures such as those in FSM 2080 were required at the time. There was concern that fire suppression efforts in 2000 could prove to be an additional weed seed source, due to the creation of bare ground when constructing fire and dozer lines, drop points, and safety zones. However, as soon as possible after their use fire and dozer lines were recontoured and rehabilitated with a non-invasive grass seed mix, fertilizer, water bars, and slash. All newly constructed safety zones were also revegetated after use. In the majority of sites, these efforts resulted in rapid establishment of vegetative cover on dozer lines to help deter weed establishment (PF; FISH-13). The seven constructed safety zones did not revegetate as well, most likely due to the higher elevation of these sites. However, these sites are less susceptible to large-scale noxious weed infestations and soil moisture may aid in natural revegetation over the long-term.