

Table F-1. Checklist that documents project effects on the individual species and habitat indicators for the **Ninemile Creek Drainage**. A lower case letter is used where a smaller magnitude of effect to the subpopulation is anticipated, i.e., one that would not move the baseline to a different category.

DIAGNOSTIC PATHWAYS: INDICATORS	POPULATION AND ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTIONS			COMMENTS
	Functioning Appropriately	Functioning at Risk	Functioning at Unacceptable Risk	Restore, Maintain, Degrade (ALT 2)	Restore, Maintain, Degrade (ALT 4)	Restore, Maintain, Degrade (ALT 5)	
<u>Subpopulation Characteristics:</u>							<ul style="list-style-type: none"> Negatively affected by short-term increase in sediment. Positively affected by a long-term decrease in sediment sources and connectivity benefits and restored mine sites. Additional access to upstream tributary habitats will help maintain and expand any resident population segments. Population connectivity within the larger Middle Clark Fork will remain a problem and limit the overall productivity and function of subpopulations.
Subpopulation Size			Few residents, no recent documentation of fluvial fish	r	r	r	
Growth & Survival			Data not available to determine trend	d/R	d/R	d/R	
Life History Diversity & Isolation			No recent documentation of fluvial fish	r	r	r	
Persistence and Genetic Integrity			Connectivity to other Clark Fork subpops is available but local habitat extremely fragmented	r	r	r	
<u>Water Quality:</u>							<ul style="list-style-type: none"> Canopy maintained by RHCA buffer, minor losses in mine site restoration counteracted by riparian planting
Temperature	Some tributary streams	Some tributary streams		M/r	M/r	M/r	
Sediment			Most streams	d/R	d/R	d/R	<ul style="list-style-type: none"> Short-term increase followed by long-term reduction in baseline via road closure, BMP, and culvert removal. Slightly greater protracted effect from harvest in Alternative 5, especially in high cumulative effects watersheds (Burnt Fork, Beecher and St. Louis Creeks). More protracted input from Alternative 2 because of longer implementation phase. The short-term increase and long-term reduction may not allow for a full category shift for this indicator. Slightly greater sediment yield reduction for Alternative 2.
Chemical Contamination / Nutrients	No data for most but most tribs likely ok,	Possible in mine site streams		M/r	M/r	M/r	<ul style="list-style-type: none"> Herbicide application effects expected to be minimal, see weed EIS; and St. Louis Creek mine

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	Functioning Appropriately	Functioning at Risk	Functioning at Unacceptable Risk	Restore, Maintain, Degrade (ALT 2)	Restore, Maintain, Degrade (ALT 4)	Restore, Maintain, Degrade (ALT 5)	
	main Ninemile with lag effects						site restoration will take care of one local contaminant source. Mainstem Ninemile to improve very little.
<u>Habitat Access:</u> Physical Barriers			Tributaries greatly fragmented	R	R	R	<ul style="list-style-type: none"> Replacement or removal of 22 passage barriers will reconnect most tributary streams to the mainstem Ninemile Creek.
<u>Habitat Elements:</u> Substrate Embeddedness			Not measured but likely similar to percent surface fines	d/R	d/R	d/R	<ul style="list-style-type: none"> Short-term increase and a long-term decrease., perhaps longer than overall sediment trends because of time for embedding sediments to transport and reduce effect.
Large Woody Debris			Greater than INFISH value, but on lower end of Lolo NF RMO range	M/r	M/r	M/r	<ul style="list-style-type: none"> Potential LWD maintained by RHCA buffer. Restoration in some watersheds from burned/dead trees and from some riparian road closures.
Pool Frequency & Quality			Most systems > than INFISH RMO but less than Lolo NF RMO, nearly all are of poor quality	d/R	d/R	d/R	<ul style="list-style-type: none"> Restoration work could cause near term degradation in pool quality, not frequency, but long-term benefits from road closure, culvert removal, and improved stream channel stability. Combined, this will initiate long-term improvement trend.
Large Pools			√	M	M	M	<ul style="list-style-type: none"> Slow recovery of larger pools. LWD recruitment needed with reductions in fine sediments and improved channel stability
Off-Channel Habitat			√	M/r	M/r	M/r	<ul style="list-style-type: none"> Improvements in areas where mine site restoration occurs, many other areas not habitats typical of extensive off-channel networks.
Refugia			√	r	r	r	<ul style="list-style-type: none"> Improvements in some tributary watersheds will have much greater potential for supporting population segments (e.g., St. Louis and Eustache)
<u>Channel Condition & Dynamics:</u> Wetted Width/Max Depth Ratio			√	M/R	M/R	M/R	<ul style="list-style-type: none"> Short-term degradation in areas with focused concentration of road closure and culvert improvement/removal. Should see long-term trend improvement in numerous watersheds.

DIAGNOSTIC PATHWAYS: INDICATORS	POPULATION AND ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTIONS			COMMENTS
	Functioning Appropriately	Functioning at Risk	Functioning at Unacceptable Risk	Restore, Maintain, Degrade (ALT 2)	Restore, Maintain, Degrade (ALT 4)	Restore, Maintain, Degrade (ALT 5)	
Streambank Condition			√ (especially in Ninemile proper)	d/r	d/r	d/r	<ul style="list-style-type: none"> Short-term degradation in areas with focused concentration of road closure and culvert improvement/removal. Should see long-term trend improvement in numerous watersheds as stream stability improves.
Floodplain Connectivity			√ (especially in Ninemile proper from floodplain modification from ag and mining, not as important in a and b tributary channels, but some fragmentation from roads and mining)	M/r	M/r	M/r	<ul style="list-style-type: none"> Improvements in watersheds where mine sites currently have removed or separate floodplain but will be restored (St. Louis, Eustache, Mattie V)
Flow & Hydrology: Change in Peak/Base Flows			See disturbance history	M/r	M/r	M/r	<ul style="list-style-type: none"> No substantial increases in ECA, even with veg treatments, suggest changes in hydrology will not occur beyond that predicted from the fires and existing conditions. A long-term improvement in peak/base flows should occur from road-based restoration work.
Drainage network Increase			√	R	R	R	<ul style="list-style-type: none"> Reduction in road density will provide substantial benefits.
Watershed Conditions: Road Density & Location			Generally > 2 and most watersheds w/ densities in 2-4.5 mile/mile ² Range (avg= 3 mile/mile ²)	R	R	R	<ul style="list-style-type: none"> Substantial reduction in road density to 1.4 miles/mile², and closure of riparian road segments in some tribs.
Disturbance History			Numerous watersheds with ECAs over 30, and most over 15, plus extensive mining in main Ninemile and	r	r	r	<ul style="list-style-type: none"> Substantial reduction in road density, and closure of riparian road segments in some tribs will considerably reduce the disturbance legacy from road. Mine site restoration will also contribute.

DIAGNOSTIC PATHWAYS: INDICATORS	POPULATION AND ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTIONS			COMMENTS
	Functioning Appropriately	Functioning at Risk	Functioning at Unacceptable Risk	Restore, Maintain, Degrade (ALT 2)	Restore, Maintain, Degrade (ALT 4)	Restore, Maintain, Degrade (ALT 5)	
			some tribs, and mainstem floodplain modifications				
Riparian Conservation Area			Past disturbance on tribs has many riparian areas in state of recovery, w/ ongoing disturbance in mainstem. Mainstem RHCAs very altered on private land.	M/r	M/r	M/r	<ul style="list-style-type: none"> • Most improvement in RHCA vegetation form and function will occur naturally, except in the high severity burn areas where riparian planting will facilitate recovery, and in watersheds where near-channel roads are closed, which will facilitate the restoration process. Mainstem RHCAs will be maintained in disturbed state.
Disturbance Regime			Disturbance (mining, roads, and fire suppression leaves many channels at risk to additional flood and fire disturbances	r	r	r	<ul style="list-style-type: none"> • Longer term benefits in the ability of watersheds to respond to disturbance regimes as culverts are pulled and improved, roads closed and improved, sediment yields are reduced and changes in hydrology stabilize.
<u>Integration of Species & Habitat Condition</u>			<p>Cumulative disruption limits bull trout production with anticipated slow recovery</p> <p>FAUR</p>	d/R	d/R	d/R	<ul style="list-style-type: none"> • Each alternative should provide long-term benefit to bull trout subpopulation with some short-term negative effects on habitat. Indicator information suggests very little difference among alternatives. Some additional short-term sediment inputs and effects from harvest in already substantially disturbed tributaries such as Burnt Fork, Beecher, and St. Louis creeks where a substantial amount of the total Ninemile Harvest will occur.

Table F-2. Checklist that documents project effects on the individual species and habitat indicators for the **Trout Creek Drainage**. A lower case letter is used where a smaller magnitude of effect to the subpopulation is anticipated, i.e., one that would not move the baseline to a different category.

DIAGNOSTIC PATHWAYS: INDICATORS	POPULATION AND ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTIONS			COMMENTS
	Functioning Appropriately	Functioning at Risk	Functioning at Unacceptable Risk	Restore, Maintain, Degrade (ALT 2)	Restore, Maintain, Degrade (ALT 4)	Restore, Maintain, Degrade (ALT 5)	
<u>Subpopulation Characteristics:</u>							
Subpopulation Size			Few residents, and possible presence of a few fluvial fish	r	r	r	<ul style="list-style-type: none"> Negatively affected by short-term increase in sediment. Positively affected by a long-term decrease in sediment sources and yield, and connectivity benefits and restored mine site. Additional access to upstream tributary habitats will help maintain and expand any resident population segments. Population connectivity within the larger Middle Clark Fork will remain a large problem that limits the overall productivity and function of subpopulations.
Growth & Survival			Data not available to determine trend, likely poor	d/R	d/R	d/R	
Life History Diversity & Isolation		Fluvial fish likely present, and not much habitat fragmentation from passage barriers		r	r	r	
Persistence and Genetic Integrity			Connectivity to other Clark Fork subpops is available. Local subpopulation habitat not that fragmented	r	r	r	
<u>Water Quality:</u>							
Temperature	Most tributary streams with suspected good thermal regimes (from point measurements and drainage attributes)	Much of mainstem Trout Creek has reduced canopy on one side from main road and mainstem mine has drastically aggraded and overwidened downstream habitats.		M	M	M	<ul style="list-style-type: none"> Canopy maintained by RHCA buffer.
Sediment			Mainstem habitats				<ul style="list-style-type: none"> short-term increase followed by long-term reduction in baseline inputs via road closure, BMP,

DIAGNOSTIC PATHWAYS: INDICATORS	POPULATION AND ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTIONS			COMMENTS
	Functioning Appropriately	Functioning at Risk	Functioning at Unacceptable Risk	Restore, Maintain, Degrade (ALT 2)	Restore, Maintain, Degrade (ALT 4)	Restore, Maintain, Degrade (ALT 5)	
		Most streams	from road and mine, and Deep and Windfall from mines	d/R	d/R	d/R	and culvert removal. Very little harvest effect by alternative, although Alternative 5 will result in added sediment yield. The short-term increase and long-term reduction may not allow for a full category shift for this indicator. Greater long-term benefit for Alternative 2.
Chemical Contamination / Nutrients		Possible mine site influences on mainstem, Deep Creek and Windfall		M/r	M/r	M/r	<ul style="list-style-type: none"> Herbicide application effects expected to be minimal, see weed EIS, Windfall Creek mine site restoration will take care of one potential local contaminant source.
<u>Habitat Access:</u> Physical Barriers		Few passage barriers compared to Ninemile, Key culvert and dam barriers on Deep Creek		r	r	r	<ul style="list-style-type: none"> Several passage barriers to be remedied on Deep Creek
<u>Habitat Elements:</u> Substrate Embeddedness		Not measured but likely similar to percent surface fines		d/r	d/r	d/r	<ul style="list-style-type: none"> Short-term increase and a long-term decrease, perhaps longer than overall sediment trends because of time for embedding sediments to transport and reduce effect. Possible greater improvement in Alternative 2.
Large Woody Debris			Greater than INFISH value, but on lower end of Lolo NF RMO range	M/r	M/r	M/r	<ul style="list-style-type: none"> Recruitment potential of LWD maintained by RHCA buffer. Restoration in some watersheds from burned/dead trees and from some riparian road closures.
Pool Frequency & Quality		Most systems > than INFISH RMO but less than Lolo NF RMO, nearly all are of poor quality	Mainstem Trout fewer pools and of low quality	d/R	d/R	d/R	<ul style="list-style-type: none"> Long-term benefits from road closure, culvert removal, and improved stream channel stability. Combined, this will initiate long-term improvement trend.
Large Pools			√ (and Main Trout Creek with limited stable large wood for pool formation)	M	M	M	<ul style="list-style-type: none"> Slow recovery of larger pools. LWD recruitment needed with reductions in fine sediments and improved channel stability.

DIAGNOSTIC PATHWAYS: INDICATORS	POPULATION AND ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTIONS			COMMENTS
	Functioning Appropriately	Functioning at Risk	Functioning at Unacceptable Risk	Restore, Maintain, Degrade (ALT 2)	Restore, Maintain, Degrade (ALT 4)	Restore, Maintain, Degrade (ALT 5)	
Off-Channel Habitat			√	M/r	M/r	M/r	<ul style="list-style-type: none"> Improvements in areas where mine site restoration occurs, many other areas not habitats typical of extensive off-channel networks.
Refugia		√		r	r	r	<ul style="list-style-type: none"> Improvements in some tributary watersheds will have much greater potential for supporting population segments (e.g., Eagle Rock and Cement creeks)
Channel Condition & Dynamics: Wetted Width/Max Depth Ratio			√	M/r	M/r	M/r	<ul style="list-style-type: none"> Short-term degradation in areas with focused concentration of road closure and culvert improvement/removal. Should see long-term trend improvement in numerous watersheds.
Streambank Condition			√ (especially in Trout Creek proper with mainstem mine and road)	d/r	d/r	d/r	<ul style="list-style-type: none"> Short-term degradation in areas with focused concentration of road closure and culvert improvement/removal. Should see long-term trend improvement in numerous watersheds as stream stability improves.
Floodplain Connectivity			√ (especially in Trout Creek proper with mine and road and also in tributary habitats with past mining activity and riparian roads)	M/r	M/r	M/r	<ul style="list-style-type: none"> Improvements in Windfall Creek where mine sites currently have removed or separate floodplain but will be restored, also some improvements in watersheds with near-channel road closures.
Flow & Hydrology: Change in Peak/Base Flows			See disturbance history	M/r	M/r	M/r	<ul style="list-style-type: none"> No substantial increases in ECA, even from veg treatment suggest changes in hydrology will not occur beyond that predicted from the fires and existing conditions. A long-term improvement in peak/base flows should occur from road-based restoration work.
Drainage network Increase			√	R	R	R	<ul style="list-style-type: none"> Reduction in road density will provide substantial benefits.
Watershed Conditions: Road Density & Location			Average road density of 2.1 miles/mile ²	R	R	R	<ul style="list-style-type: none"> Drainage road density will be reduced to 1.2 miles/mile²

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	Functioning Appropriately	Functioning at Risk	Functioning at Unacceptable Risk	Restore, Maintain, Degrade (ALT 2)	Restore, Maintain, Degrade (ALT 4)	Restore, Maintain, Degrade (ALT 5)	
Disturbance History			Extensive mining and some high road densities in watersheds, ECA not high in most watersheds	r	r	r	<ul style="list-style-type: none"> Substantial reduction in road density, and closure of riparian road segments in some tribs. Mine site restoration in Windfall will greatly improve that watershed.
Riparian Conservation Area			Some past disturbance on tribs has riparian areas in state of recovery, w/ ongoing disturbance in mainstem from mine and road.	M/r	M/r	M/r	<ul style="list-style-type: none"> Most improvement in RHCA vegetation form and function will occur naturally, except in the high severity burn areas where riparian planting will facilitate recovery, and in watersheds where near-channel roads are closed, which will facilitate the restoration process. Mainstem will see little improvement.
Disturbance Regime			Disturbance (mining, roads, and moderate harvest) leaves many channels at risk to additional flood and fire disturbances	r	r	r	<ul style="list-style-type: none"> Longer-term benefits in the ability of watersheds to respond in disturbance regimes as culverts are pulled and improved, roads are closed and improved, and sediment yield and changes in hydrology stabilize.
<u>Integration of Species & Habitat Condition</u>			<p>Cumulative disruption limits bull trout production with anticipated slow recovery</p> <p>FAUR</p>	d/R	d/R	d/R	<ul style="list-style-type: none"> Each alternative should provide long-term benefit to bull trout subpopulation with some short-term negative effects on habitat. Sediment yield information suggests Alternative 2 will have the greatest reduction. Some additional short-term sediment inputs will occur under Alternative 5, but the effects of this will be small compared to road effects. Benefits from road and culvert work will not be as great compared to Ninemile because of a lesser degree of fragmentation from culverts in the existing condition.

Table F-3. Checklist that documents project effects on the individual species and habitat indicators for the **Siegel Creek Drainage**. A lower case letter is used where a smaller magnitude of effect to the subpopulation is anticipated, i.e., one that would not move the baseline to a different category.

DIAGNOSTIC PATHWAYS: INDICATORS	POPULATION AND ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTIONS			COMMENTS
	Functioning Appropriately	Functioning at Risk	Functioning at Unacceptable Risk	Restore, Maintain, Degrade (ALT 2)	Restore, Maintain, Degrade (ALT 4)	Restore, Maintain, Degrade (ALT 5)	
<u>Subpopulation Characteristics:</u>			√				<ul style="list-style-type: none"> No recent documentation of bull trout presence, but no information to suggest that they would be absent. Primarily limited to overall productivity of the middle Clark Fork population. Small increase in sediment from actions not likely to functionally degrade situation further for fish. Small positive effect by a long-term decrease in sediment sources and some benefits improved connectivity at upper end of the drainage. At least partial fish access from the Clark Fork River.
Subpopulation Size				r	r	r	
Growth & Survival			√	r	r	r	
Life History Diversity & Isolation		√		r	r	r	
Persistence and Genetic Integrity			√	M	M	M	
<u>Water Quality:</u>		Point measurements suggest mid-day summer temperatures are suitable to those required for rearing. No other seasonal data					<ul style="list-style-type: none"> Existing canopy maintained by RHCA buffer, minimal near-channel road closure
Temperature				M	M	M	
Sediment		√ (Total sediment yield less than that of the composite)		d/R	d/R	d/R	<ul style="list-style-type: none"> Short-term increase in sediment yield followed by substantial long-term reduction in baseline via road closure, BMP, and culvert replacement/removal. Very minor differences among alternatives.

DIAGNOSTIC PATHWAYS: INDICATORS	POPULATION AND ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTIONS			COMMENTS
	Functioning Appropriately	Functioning at Risk	Functioning at Unacceptable Risk	Restore, Maintain, Degrade (ALT 2)	Restore, Maintain, Degrade (ALT 4)	Restore, Maintain, Degrade (ALT 5)	
Chemical Contamination / Nutrients	No information but assumed minimal from minimal mining and agricultural activity.			M	M	M	<ul style="list-style-type: none"> Herbicide application effects expected to be minimal, see weed EIS.
<u>Habitat Access:</u> Physical Barriers		√		r	r	r	<ul style="list-style-type: none"> Not a highly fragmented drainage, one major fish passage barrier previously removed. Passage from Clark Fork into the tributary possible under some flow conditions, and one upper mainstem culvert that is at least a partial barrier will be improved.
<u>Habitat Elements:</u> Substrate Embeddedness		Not measured but likely similar to percent surface fines		d/R	d/R	d/R	<ul style="list-style-type: none"> Short-term increase combined with a substantial longer-term decrease in sediment yield from road closure and BMPs.
Large Woody Debris		Greater than INFISH value, but at the lower end of the Lolo NF RMO range		M	M	M	<ul style="list-style-type: none"> Potential LWD maintained by RHCA buffer. Future contribution from burned/dead trees.
Pool Frequency & Quality			Greater than INFISH RMO but near that for the Lolo NF RMO; Pool quality is limiting	d/R	d/R	d/R	<ul style="list-style-type: none"> Work under each alternative may cause near term degradation in pool quality, not frequency, but long-term benefits from road closure, culvert replacement, and improved stream channel stability. Combined, this will initiate long-term improvement trend.
Large Pools			√	M	M	M	<ul style="list-style-type: none"> Slow recovery of larger pools, pool quality benefits from sediment reduction, presence of large pools partially inhibited by near-channel road that further confines a naturally confined system.
Off-Channel Habitat			√	M	M	M	<ul style="list-style-type: none"> Limited opportunity in this project for improving off-channel habitats, in large part due to the valley form.
Refugia			√	r	r	r	<ul style="list-style-type: none"> Some improvement in this drainage by fixing one culvert fish passage barrier at the upper end of the mainstem.

DIAGNOSTIC PATHWAYS: INDICATORS	POPULATION AND ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTIONS			COMMENTS
	Functioning Appropriately	Functioning at Risk	Functioning at Unacceptable Risk	Restore, Maintain, Degrade (ALT 2)	Restore, Maintain, Degrade (ALT 4)	Restore, Maintain, Degrade (ALT 5)	
<u>Channel Condition & Dynamics:</u> Wetted Width/Max Depth Ratio			√ (less than INFISH and Lolo NF RMO)	d/R	d/R	d/R	<ul style="list-style-type: none"> Likely to be degraded minimally from road closure with substantial reduction in sediment yield will contribute to long-term improvement trend.
Streambank Condition			√	r	r	r	<ul style="list-style-type: none"> Benefits of road and culvert improvement to channel stability that may help improve streambank condition.
Floodplain Connectivity			√	M	M	M	<ul style="list-style-type: none"> Project will maintain status quo. Much of drainage affected by a near-channel road and valley form.
<u>Flow & Hydrology:</u> Change in Peak/Base Flows		√		M/r	M/r	M	<ul style="list-style-type: none"> No increase in ECA. A longer-term improvement in peak/base flow regime should occur from road-based restoration work.
Drainage network Increase		√		r	r	r	<ul style="list-style-type: none"> Small reduction in road density will provide some benefits.
<u>Watershed Conditions:</u> Road Density & Location		1.2 mile/mile ²		r	r	r	<ul style="list-style-type: none"> Road density will be reduced to 1.0 mile/mile², Near-channel road in lower portion of drainage will continue to affect channel.
Disturbance History		ECA at 8 (but confined nature of channel by road will contribute to ongoing disturbance)		M/r	M/r	M/r	<ul style="list-style-type: none"> Road closure and culvert work for all alternatives will have moderate long-term benefits.
Riparian Conservation Area			√	M	M	M	<ul style="list-style-type: none"> Actions for each alternative not expected to have adverse effect, and RHCAs for harvest treatments in Alternatives 4 and 5 will maintain status quo.
Disturbance Regime			√	M/r	M/r	M/r	<ul style="list-style-type: none"> Improvements from road closure and culvert removal.

DIAGNOSTIC PATHWAYS: INDICATORS	POPULATION AND ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTIONS			COMMENTS
	Functioning Appropriately	Functioning at Risk	Functioning at Unacceptable Risk	Restore, Maintain, Degrade (ALT 2)	Restore, Maintain, Degrade (ALT 4)	Restore, Maintain, Degrade (ALT 5)	
<u>Integration of Species & Habitat Condition</u>			Some favorable conditions compared to the Clark Fork Composite drainages, near channel road effects will place ongoing stress on the system. FAUR	d/R	d/R	d/R	<ul style="list-style-type: none"> Each alternative will provide a modest long-term benefit to bull trout habitat in this drainage, primarily from removing additional roads and a resultant moderate drainage road density. Overall, actions under each alternative will do little to move this drainage from FAUR to FAR. Harvest activity expected to have minor effects to habitat conditions.

Table F-4. Checklist that documents project effects on the individual species and habitat indicators for the **First Creek Drainage**. A lower case letter is used where a smaller magnitude of effect to the subpopulation is anticipated, i.e., one that would not move the baseline to a different category.

DIAGNOSTIC PATHWAYS: INDICATORS	POPULATION AND ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTIONS			COMMENTS
	Functioning Appropriately	Functioning at Risk	Functioning at Unacceptable Risk	Restore, Maintain, Degrade (ALT 2)	Restore, Maintain, Degrade (ALT 4)	Restore, Maintain, Degrade (ALT 5)	
Subpopulation Characteristics:							<ul style="list-style-type: none"> Negatively affected by short-term increase in sediment. Positively affected by a long-term decrease in sediment sources and some benefits from connectivity Passage barrier remedy will provide access to upper half of mainstem and tribs will help maintain and expand any resident population segments that may be present.
Subpopulation Size			no recent documentation of resident or fluvial fish	d/r	d/r	d/r	
Growth & Survival			√	d/r	d/r	d/r	
Life History Diversity & Isolation			√	r	r	r	
Persistence and Genetic Integrity			Connectivity to other Clark Fork subpops is generally not available	r	r	r	
<u>Water Quality:</u>							<ul style="list-style-type: none"> Existing canopy maintained by RHCA buffer, minimal near-channel road closure
Temperature		Point temperatures suggest favorable rearing temps, other seasonal temperatures and trends unknown		M	M	M	
Sediment			√ (high drainage sediment yields (% over natural))	d/r	d/r	d/r	<ul style="list-style-type: none"> Short-term sediment yield increase followed by long-term reduction in baseline inputs via road closure, BMP, and culvert removal. Substantial long-term reduction in sediment yield for Alternative 2 and lesser reductions for Alternatives 4 and 5.
Chemical Contamination / Nutrients	No information but assumed limited from minimal mining and agricultural activity.			M	M	M	<ul style="list-style-type: none"> Herbicide application effects expected to be minimal, see weed EIS.

DIAGNOSTIC PATHWAYS: INDICATORS	POPULATION AND ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTIONS			COMMENTS
	Functioning Appropriately	Functioning at Risk	Functioning at Unacceptable Risk	Restore, Maintain, Degrade (ALT 2)	Restore, Maintain, Degrade (ALT 4)	Restore, Maintain, Degrade (ALT 5)	
<u>Habitat Access:</u> Physical Barriers			√	r	r	r	<ul style="list-style-type: none"> Not a highly fragmented drainage, with one mid-drainage fish passage barrier removed. Passage from Clark Fork into First Creek limited from culvert under road near mouth with Clark Fork and surface flow connectivity to the Clark Fork often an issue.
<u>Habitat Elements:</u> Substrate Embeddedness			Sediment yield in system high, percent surface fines moderate	d/r	d/r	d/r	<ul style="list-style-type: none"> Short-term increase and a long-term decrease.
Large Woody Debris		Greater than INFISH value; just slightly lower than Lolo NF RMO for undisturbed watersheds		M	M	M	<ul style="list-style-type: none"> Potential LWD maintained by RHCA buffer. Future contribution from burned/dead trees will occur. Existing condition data suggest this index is near functioning appropriately when compared to Lolo NF RMO.
Pool Frequency & Quality			Greater than INFISH RMO but less than Lolo NF RMO, with limited pool quality	d/r	d/r	d/r	<ul style="list-style-type: none"> Work under each alternative may cause near-term degradation in pool quality, not frequency, but long-term benefits from road closure, culvert removal, and improved stream channel stability. Combined, this will initiate long-term improvement trend, just not of the magnitude as expected for Ninemile or Trout drainages.
Large Pools			√	M	M	M	<ul style="list-style-type: none"> Slow recovery of larger pools, although some pool quality benefits from sediment reduction.
Off-Channel Habitat			√	M	M	M	<ul style="list-style-type: none"> Limited opportunity in this project for improving off-channel habitats.
Refugia			√	r	r	r	<ul style="list-style-type: none"> Some improvement in this drainage via replacement of large culvert in the middle of the drainage that is a current fish passage barrier.
<u>Channel Condition & Dynamics:</u> Wetted Width/Max Depth Ratio			√	d/r	d/r	d/r	<ul style="list-style-type: none"> Possible short-term degradation from road closure and culvert work. Should see long-term improvement trend from sediment yield reductions.
Streambank Condition		√		r	r	r	<ul style="list-style-type: none"> Minor longer-term improvement benefits of road and culvert improvement to channel stability.

DIAGNOSTIC PATHWAYS: INDICATORS	POPULATION AND ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTIONS			COMMENTS
	Functioning Appropriately	Functioning at Risk	Functioning at Unacceptable Risk	Restore, Maintain, Degrade (ALT 2)	Restore, Maintain, Degrade (ALT 4)	Restore, Maintain, Degrade (ALT 5)	
Floodplain Connectivity			√ (some decent floodplain habitat in upper section of mainstem but lower section extremely limited)	M	M	M	<ul style="list-style-type: none"> Project will maintain status quo.
<u>Flow & Hydrology:</u> Change in Peak/Base Flows			√	M/r	M/r	M/r	<ul style="list-style-type: none"> No substantial increases in already high ECA. A small long-term improvement in peak/base flows should occur from road-based restoration work.
Drainage network Increase			√	r	r	r	<ul style="list-style-type: none"> Small reduction in road density will provide some benefits.
<u>Watershed Conditions:</u> Road Density & Location			4.5 mile/mile ²	r	r	r	<ul style="list-style-type: none"> Road density will be reduced to 3.5 mile/mile², and remain in a high road density classification.
Disturbance History			ECA at 30	M/r	M/r	M	<ul style="list-style-type: none"> Road closure for all alternatives will have some long-term benefits, harvest in Alternatives 4 and 5 not expected to increase ECA. Some harvest activity w/in 300 feet of channel may increase short-term sediment delivery to intermittent channels.
Riparian Conservation Area			√	M	M	M	<ul style="list-style-type: none"> Actions for each alternative not expected to have adverse affect, and RHCAs for harvest treatments in Alternatives 4 and 5 will maintain status quo.
Disturbance Regime			High level of past private and Forest road and vegetation management.	M	M	M/d	<ul style="list-style-type: none"> Small improvement by proper sizing of main culvert, but high road density and ECA leave the watershed at risk to disturbance. Additional short-term disturbance under Alternative 5 from 30 acres of harvest w/in 300 feet of channel

DIAGNOSTIC PATHWAYS: INDICATORS	POPULATION AND ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTIONS			COMMENTS
	Functioning Appropriately	Functioning at Risk	Functioning at Unacceptable Risk	Restore, Maintain, Degrade (ALT 2)	Restore, Maintain, Degrade (ALT 4)	Restore, Maintain, Degrade (ALT 5)	
<u>Integration of Species & Habitat Condition</u>			Cumulative disruption limits production potential for resident bull trout. Drainage to recover slowly. FAUR	d/r	d/r	d/r	<ul style="list-style-type: none"> Each alternative to provide a modest long-term benefit to bull trout habitat in this drainage, primarily from reconnecting habitats in upper and lower drainage, and sediment yield reductions. Overall, actions under each alternative will improve fisheries condition but may not move this drainage from FAUR to FAR. Also, limited fish connectivity between Clark Fork and First Creek contributes to population effects.

Table F-5. Checklist that documents project effects on the individual species and habitat indicators for the **Johnson Creek Drainage**. A lower case letter is used where a smaller magnitude of effect to the subpopulation is anticipated, i.e., one that would not move the baseline to a different category.

DIAGNOSTIC PATHWAYS: INDICATORS	POPULATION AND ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTIONS			COMMENTS
	Functioning Appropriately	Functioning at Risk	Functioning at Unacceptable Risk	Restore, Maintain, Degrade (ALT 2)	Restore, Maintain, Degrade (ALT 4)	Restore, Maintain, Degrade (ALT 5)	
Subpopulation Characteristics: Subpopulation Size			No recent documentation of resident or fluvial fish. Post-fire mudslides major impact to fish.	M	M	M	<ul style="list-style-type: none"> • Short-term increase in sediment from actions not likely to functionally degrade situation further for fish. Small positive effect by a long-term decrease in sediment sources and some benefits from connectivity • Additional access to upstream tributary habitats on E. Fork will help maintain and expand any resident population segments that may or will be present • Lack of fish connectivity between Clark Fork and Johnson Creek will remain a significant limitation of population.
Growth & Survival			√ (overall near-term habitat condition for lower half of drainage highly degraded)	r	r	r	
Life History Diversity & Isolation			√	M	M	M	
Persistence and Genetic Integrity			Connectivity to other Clark Fork subpops not available and limiting	M	M	M	
Water Quality: Temperature			Point measurements suggest mid-day summer temperatures near the upper end of temperatures required for rearing	M	M	M	<ul style="list-style-type: none"> • Existing canopy maintained by RHCA buffer, minimal near-channel road closure
Sediment			√ (one of the highest sediment yields (% over natural) for a project	d/r	d/r	d/r	<ul style="list-style-type: none"> • Short-term sediment yield followed by smaller long-term reduction in baseline inputs via road closure, BMP, and culvert replacement/removal. No difference among alternatives. The short-term increase and long-term reduction will not likely allow

DIAGNOSTIC PATHWAYS: INDICATORS	POPULATION AND ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTIONS			COMMENTS
	Functioning Appropriately	Functioning at Risk	Functioning at Unacceptable Risk	Restore, Maintain, Degrade (ALT 2)	Restore, Maintain, Degrade (ALT 4)	Restore, Maintain, Degrade (ALT 5)	
			drainage)				for a full category shift for this indicator, especially considering unquantified sediment inputs from the 2000 debris flow.
Chemical Contamination / Nutrients		No information but assumed limited from minimal mining, although some potential agricultural effects in lower end.		M	M	M	<ul style="list-style-type: none"> Herbicide application effects expected to be minimal, see weed EIS.
<u>Habitat Access:</u> Physical Barriers			√	r	r	r	<ul style="list-style-type: none"> Not a highly fragmented drainage, several tributary fish passage barriers will be removed. Lack of passage from Clark Fork into the tributary and eliminates access to fluvial fish.
<u>Habitat Elements:</u> Substrate Embeddedness			Sediment yield very high, percent surface fines very high (the highest for all project drainages)	d/r	d/r	d/r	<ul style="list-style-type: none"> Short-term increase and a long-term decrease. Possible greater degradation from Alternative 5 because of considerable harvest w/in 300 feet of intermittent stream channels.
Large Woody Debris			Greater than INFISH value, but considerably lower than Lolo NF RMO	M	M	M	<ul style="list-style-type: none"> Potential LWD maintained by RHCA buffer. Future contribution from burned/dead trees.
Pool Frequency & Quality			Greater than INFISH RMO but less than Lolo NF RMO, with limited pool quality	d/r	d/r	d/r	<ul style="list-style-type: none"> Work under each alternative will cause near term degradation in pool quality, not frequency, but long-term benefits from road closure, culvert removal, and improved stream channel stability. Combined, this will initiate long-term improvement trend, but not of the magnitude expected for Ninemile or Trout drainages.
Large Pools			√	M	M	M	<ul style="list-style-type: none"> Slow recovery of larger pools, pool quality benefits from sediment reduction likely to be greatly inhibited due to existing high sediment levels in pools.
Off-Channel Habitat			√	M	M	M	<ul style="list-style-type: none"> Limited opportunity in this project for improving off-channel habitats.

DIAGNOSTIC PATHWAYS: INDICATORS	POPULATION AND ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTIONS			COMMENTS
	Functioning Appropriately	Functioning at Risk	Functioning at Unacceptable Risk	Restore, Maintain, Degrade (ALT 2)	Restore, Maintain, Degrade (ALT 4)	Restore, Maintain, Degrade (ALT 5)	
Refugia			√	r	r	r	<ul style="list-style-type: none"> Some improvement in this drainage by correcting two culvert fish passage barriers on the E. Fork.
<u>Channel Condition & Dynamics:</u>							
Wetted Width/Max Depth Ratio			√	M/r	M/r	M/r	<ul style="list-style-type: none"> Not likely to be degraded beyond existing condition, even from road closure and culvert work. Likely smaller long-term improvement trend compared to other drainages because of modest level of road closure.
Streambank Condition			√	r	r	r	<ul style="list-style-type: none"> Minor longer term improvement benefits of road and culvert improvement to channel stability.
Floodplain Connectivity			√	M	M	M	<ul style="list-style-type: none"> Project will maintain status quo. Lower portion of drainage limited by riparian road.
<u>Flow & Hydrology:</u>							
Change in Peak/Base Flows			√	M/r	M/r	M	<ul style="list-style-type: none"> No substantial increases in already high ECA. A small long-term improvement in peak/base flows should occur from road-based restoration work. Alternative 5 will have small increase in moderately high existing ECA (from 33to 34%).
Drainage network Increase			√	r	r	r	<ul style="list-style-type: none"> Small reduction in road density will provide some benefits.
<u>Watershed Conditions:</u>							
Road Density & Location			4.1 mile/mile ²	r	r	r	<ul style="list-style-type: none"> Road density will be reduced to 3.4 mile/mile², and remain in a high road density classification. Riparian road in lower portion of drainage will continue to affect channel condition.
Disturbance History			ECA at 33	M/r	M/r	M	<ul style="list-style-type: none"> Road closure for all alternatives will have moderate long-term benefits; harvest in Alternative 5 will result in small ECA increase from 20 to 22%. Harvest activity w/in 300 feet of channel may offset some road and culvert benefits under Alternative 5.
Riparian Conservation Area			√	M	M	M	<ul style="list-style-type: none"> Actions for each alternative not expected to have adverse effect, and RHCAs for harvest treatments in Alternatives 4 and 5 will maintain status quo.

DIAGNOSTIC PATHWAYS: INDICATORS	POPULATION AND ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTIONS			COMMENTS
	Functioning Appropriately	Functioning at Risk	Functioning at Unacceptable Risk	Restore, Maintain, Degrade (ALT 2)	Restore, Maintain, Degrade (ALT 4)	Restore, Maintain, Degrade (ALT 5)	
Disturbance Regime			High level of past private and Forest road and vegetation management, and extensive road and jammer road network. Debris torrent in 2000 indication of susceptibility	M	M	d/M	<ul style="list-style-type: none"> Small improvements from culvert removals, but high road density will remain. Sediment yield, and moderate ECA leave the watershed at risk to future disturbance. Additional short-term disturbance under Alternative 5 from 90 acres of harvest w/in 300 feet of channel.
<u>Integration of Species & Habitat Condition</u>			Cumulative disruption limits production potential for resident bull trout. Drainage to recover slowly, with some smaller improvements in road affects.	d/r	d/r	d/r	<ul style="list-style-type: none"> Each alternative to provide a very modest long-term benefit to bull trout habitat in this drainage, primarily from reconnecting lower and upper drainage habitats, and smaller amounts of road closure. Overall, actions under each alternative will do little to move this drainage from FAUR to FAR. Also, lack of fish connectivity between Clark Fork and Johnson Creek plays a role in this limitation.

Table F-6. Checklist that documents project effects on the individual species and habitat indicators for the **Idaho Gulch Drainage**. A lower case letter is used where a smaller magnitude of effect to the subpopulation is anticipated, i.e., one that would not move the baseline to a different category.

DIAGNOSTIC PATHWAYS: INDICATORS	POPULATION AND ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTIONS			COMMENTS
	Functioning Appropriately	Functioning at Risk	Functioning at Unacceptable Risk	Restore, Maintain, Degrade (ALT 2)	Restore, Maintain, Degrade (ALT 4)	Restore, Maintain, Degrade (ALT 5)	
Subpopulation Characteristics:			No recent documentation of resident or fluvial fish and very limited potential.				<ul style="list-style-type: none"> • Overall general character of Drainage limits direct fish production opportunities • Lack of fish connectivity between Clark Fork and Idaho Gulch. • Improved habitat conditions will do little to increase production capability of drainage. System consists primarily of high gradient and unstable channel features.
Subpopulation Size				M	M	M	
Growth & Survival			√	M	M	M	
Life History Diversity & Isolation			√	M	M	M	
Persistence and Genetic Integrity			Connectivity to other Clark Fork subpops not available	M	M	M	
Water Quality:							<ul style="list-style-type: none"> • Actual stream-specific fisheries information not collected from this system
Temperature			nd	M	M	M	
Sediment			√ (very high sediment yield above natural suggest channel sediment level will be high)	d/r	d/r	d/r	<ul style="list-style-type: none"> • Short-term increase in sediment yield followed by small long-term reduction in baseline inputs via road closure, BMP, and culvert replacement/removal. The short-term increase and long-term reduction, combined with existing condition not likely to allow for a full category shift for this indicator, especially considering existing sediment and future sediment yield levels.
Chemical Contamination / Nutrients	Unknown (but unlikely)			M	M	M	<ul style="list-style-type: none"> • Herbicide application effects expected to be minimal, see weed EIS.

DIAGNOSTIC PATHWAYS: INDICATORS	POPULATION AND ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTIONS			COMMENTS
	Functioning Appropriately	Functioning at Risk	Functioning at Unacceptable Risk	Restore, Maintain, Degrade (ALT 2)	Restore, Maintain, Degrade (ALT 4)	Restore, Maintain, Degrade (ALT 5)	
<u>Habitat Access:</u> Physical Barriers			√	M	M	M	<ul style="list-style-type: none"> Natural (subsurface flow) barrier to fish movement from Clark Fork to Idaho Gulch.
<u>Habitat Elements:</u> Substrate Embeddedness			Embeddedness not measured. Drainage sediment yield high, suspect embeddedness is high	M	M	M	<ul style="list-style-type: none"> Short-term increase and modest long-term decrease in sediment yield from actions.
Large Woody Debris			no stream-specific data	M	M	M	<ul style="list-style-type: none"> Potential LWD maintained by RHCA buffer. Future contribution from burned/dead trees.
Pool Frequency & Quality			No stream-specific data (likely to be poor based on past activities and similarities with other composite drainages)	d/r	d/r	d/r	<ul style="list-style-type: none"> Work under each alternative will cause near term degradation in pool quality, not frequency, and some long-term benefits from road closure.
Large Pools			√	M	M	M	
Off-Channel Habitat			√	M	M	M	<ul style="list-style-type: none"> This is a high gradient system with limited opportunity for floodplain development.
Refugia			√	M	M	M	
<u>Channel Condition & Dynamics:</u> Wetted Width/Max Depth Ratio			√ (no data, but probably similar to Flat and Johnson Drainages)	d/r	d/r	d/r	<ul style="list-style-type: none"> Not likely to be degraded beyond existing condition, even from road closure work. Could see small long-term improvement trend in existing condition from modest level of road closure.

DIAGNOSTIC PATHWAYS: INDICATORS	POPULATION AND ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTIONS			COMMENTS
	Functioning Appropriately	Functioning at Risk	Functioning at Unacceptable Risk	Restore, Maintain, Degrade (ALT 2)	Restore, Maintain, Degrade (ALT 4)	Restore, Maintain, Degrade (ALT 5)	
Streambank Condition			√ (unknown)	M	M	M	
Floodplain Connectivity			√ (unknown)	M	M	M	<ul style="list-style-type: none"> Project will maintain status quo. Lower portion of Creek on private land.
<u>Flow & Hydrology:</u> Change in Peak/Base Flows			√	M/r	M/r	M	<ul style="list-style-type: none"> Existing high ECA (44%). A small long-term improvement in peak/base flows may occur from road-based restoration work. Alternative 5 will have small increase in high existing ECA (from 44 to 45%).
Drainage network Increase			√	r	r	r	<ul style="list-style-type: none"> Reduction in headwater road density will provide some benefits.
<u>Watershed Conditions:</u> Road Density & Location			4.8 mile/mile ²	M/r	M/r	M/r	<ul style="list-style-type: none"> Road density will be reduced to 4.2 mile/mile², and remain in a high road density classification.
Disturbance History			√ (extensive past vegetation and road management activity)	M/r	M/r	M	<ul style="list-style-type: none"> Road closure for all alternatives will have very modest long-term benefits.
Riparian Conservation Area			√ (unknown)	M	M	M	<ul style="list-style-type: none"> Actions for each alternative not expected to have adverse effect, and RHCAs for harvest treatments in Alternatives 4 and 5 will maintain status quo. Half of the lower drainage affected by riparian road.
Disturbance Regime			Terrain, fire and past management leave system susceptible to disturbance	M	M	M	<ul style="list-style-type: none"> Some improvements from road closures, but high road density, sediment yield, and high ECA leave the watershed at risk to future disturbance.

DIAGNOSTIC PATHWAYS: INDICATORS	POPULATION AND ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTIONS			COMMENTS
	Functioning Appropriately	Functioning at Risk	Functioning at Unacceptable Risk	Restore, Maintain, Degrade (ALT 2)	Restore, Maintain, Degrade (ALT 4)	Restore, Maintain, Degrade (ALT 5)	
<u>Integration of Species & Habitat Condition</u>			Cumulative disruption and natural conditions are expected to limit production potential for resident bull trout. FAUR	d/r	d/r	d/r	<ul style="list-style-type: none"> Overall, actions under each alternative will do little to move this drainage from FAUR to FAR. Also, lack of fish connectivity between Clark Fork and Idaho Gulch plays a role in limiting production potential in this system.

Table F-7. Checklist that documents project effects on the individual species and habitat indicators for the **Flat Creek Drainage**. A lower case letter is used where a smaller magnitude of effect to the subpopulation is anticipated, i.e., one that would not move the baseline to a different category.

DIAGNOSTIC PATHWAYS: INDICATORS	POPULATION AND ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTIONS			COMMENTS
	Functioning Appropriately	Functioning at Risk	Functioning at Unacceptable Risk	Restore, Maintain, Degrade (ALT 2)	Restore, Maintain, Degrade (ALT 4)	Restore, Maintain, Degrade (ALT 5)	
Subpopulation Characteristics:			no recent documentation of resident or fluvial fish.	m	m	m	<ul style="list-style-type: none"> • Short-term increase in sediment from actions. Positive effect by a long-term decrease in sediment sources and some benefits from connectivity by restoring dam site in the middle of the drainage and providing fish passage upstream. • Additional access to good quality upstream mainstem habitats will help maintain and expand any resident population segments that may or could be present. • Lack of fish connectivity between Clark Fork and Flat Creek will remain a significant limitation of population.
Subpopulation Size							
Growth & Survival			√	r	r	r	
Life History Diversity & Isolation			√	r	r	r	
Persistence and Genetic Integrity			Connectivity to other Clark Fork subpops not available	M	M	M	
<u>Water Quality:</u>			Point measurements suggest mid-day summer temperatures near the upper end of temperatures required for rearing	M	M	M	<ul style="list-style-type: none"> • Existing canopy maintained by RHCA buffer, minimal near-channel road closure, no expected changes in stream temperature. Possibly smaller local increase from vegetation disturbance related to dam site restoration.
Temperature							
Sediment			√ (elevated total sediment yield but the lowest for composite drainages in project area)	d/R	d/R	d/R	<ul style="list-style-type: none"> • Short-term increase in sediment yield followed by long-term reduction in baseline inputs via road closure and BMPs.

DIAGNOSTIC PATHWAYS: INDICATORS	POPULATION AND ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTIONS			COMMENTS
	Functioning Appropriately	Functioning at Risk	Functioning at Unacceptable Risk	Restore, Maintain, Degrade (ALT 2)	Restore, Maintain, Degrade (ALT 4)	Restore, Maintain, Degrade (ALT 5)	
Chemical Contamination / Nutrients			Past mining activity with some known effects on water quality	M	M	M	<ul style="list-style-type: none"> Herbicide applications effects should be minimal, see weed EIS. Multi-agency group working on long-term remedy for mine tailings and water quality issues.
<u>Habitat Access:</u> Physical Barriers			√	r	r	r	<ul style="list-style-type: none"> Not a highly fragmented drainage, but dam mainstem separates fish population segments in drainage. Passage from Clark Fork into the tributary is the largest passage problem.
<u>Habitat Elements:</u> Substrate Embeddedness			Embeddedness not measured. Drainage sediment yield high, percent surface fines moderate.	d/r	d/r	d/r	<ul style="list-style-type: none"> Short-term increase and a long-term decrease.
Large Woody Debris			Higher than INFISH RMO but substantially lower than Lolo NF RMO	M	M	M	<ul style="list-style-type: none"> Potential LWD maintained by RHCA buffer. Future contribution from burned/dead trees. Extensive riparian roading will limit recruitment processes in lower half of the drainage.
Pool Frequency & Quality			Greater than INFISH RMO but less than Lolo NF RMO, with poor pool quality	d/r	d/r	d/r	<ul style="list-style-type: none"> Work under each alternative may cause near-term degradation in pool quality, not frequency, with longer-term benefits from road closure, and dam restoration. Combined, this will initiate long-term improvement trend. Benefits from sediment reduction may be somewhat limited by effects from debris flow mid-way up the drainage.
Large Pools			√ (no large pools per INFISH standard)	M	M	M	<ul style="list-style-type: none"> Slow recovery of larger pools.
Off-Channel Habitat			√	M	M	M	<ul style="list-style-type: none"> Limited opportunity in this project for improving off-channel habitats. Lower half of the system also confined by riparian road.
Refugia			√	r	r	r	<ul style="list-style-type: none"> Improvement in this drainage by restoring fish passage barrier at dam site.

DIAGNOSTIC PATHWAYS: INDICATORS	POPULATION AND ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTIONS			COMMENTS
	Functioning Appropriately	Functioning at Risk	Functioning at Unacceptable Risk	Restore, Maintain, Degrade (ALT 2)	Restore, Maintain, Degrade (ALT 4)	Restore, Maintain, Degrade (ALT 5)	
<u>Channel Condition & Dynamics:</u> Wetted Width/Max Depth Ratio			√	M/r	M/r	M/r	<ul style="list-style-type: none"> Not likely to be degraded beyond existing condition, even from road closure and culvert work. Likely smaller long-term improvement trend compared to other drainages because of modest level of road closure.
Streambank Condition			√	r	r	r	<ul style="list-style-type: none"> Minor longer-term benefits to channel stability from road closure, although dam restoration will provide local channel stability improvement.
Floodplain Connectivity			√	M	M	M	<ul style="list-style-type: none"> Project will maintain status quo. Lower portion of flat creek and mine tailings disrupt floodplain connectivity
<u>Flow & Hydrology:</u> Change in Peak/Base Flows			√	M/r	M/r	M	<ul style="list-style-type: none"> No increases in relatively low drainage ECA (8%). A small long-term improvement in peak/base flow patterns should occur from road-based restoration work.
Drainage network Increase			√	r	r	r	<ul style="list-style-type: none"> Small reduction in road density will provide some benefits.
<u>Watershed Conditions:</u> Road Density & Location			2.6 mile/mile ²	M	M	M	<ul style="list-style-type: none"> Road density will be reduced to 2.3 mile/mile², and remain in a high road density classification, although considerably lower than the other project composite drainages.
Disturbance History			√	M/r	M	M	<ul style="list-style-type: none"> Mining history a substantial influence on channel stability and function. Road closure for all alternatives will have moderate long-term benefits, harvest in Alternatives 4 and 5 will result in moderate level of treatment within 300 feet of intermittent channels.
Riparian Conservation Area			√	M	M	M	<ul style="list-style-type: none"> Actions for each alternative not expected to have adverse affect, and RHCAs for harvest treatments in Alternatives 4 and 5 will maintain status quo. Half of the lower drainage affected by riparian road.
Disturbance Regime			Debris flow after 2000 fires indication				<ul style="list-style-type: none"> Some improvements from dam site restoration and road closure, but high road density, sediment yield,

DIAGNOSTIC PATHWAYS: INDICATORS	POPULATION AND ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTIONS			COMMENTS
	Functioning Appropriately	Functioning at Risk	Functioning at Unacceptable Risk	Restore, Maintain, Degrade (ALT 2)	Restore, Maintain, Degrade (ALT 4)	Restore, Maintain, Degrade (ALT 5)	
			of susceptibility of drainage to disturbance	M	M	M/d	leave the watershed at risk to disturbance. Additional short-term disturbance under Alternatives 4 and 5 from 36 acres of harvest w/in 300 feet of channel.
<u>Integration of Species & Habitat Condition</u>			Cumulative disruption limits production potential for resident bull trout. FAUR	d/r	d/r	d/r	<ul style="list-style-type: none"> Each alternative to provide a modest long-term benefit to bull trout habitat in this drainage, primarily from reconnecting lower and upper drainage habitats, and smaller amounts of road closure. Overall, actions under each alternative will do little to move this drainage from FAUR to FAR. Also, lack of fish connectivity between Clark Fork and Flat Creek also plays a role in this limitation.