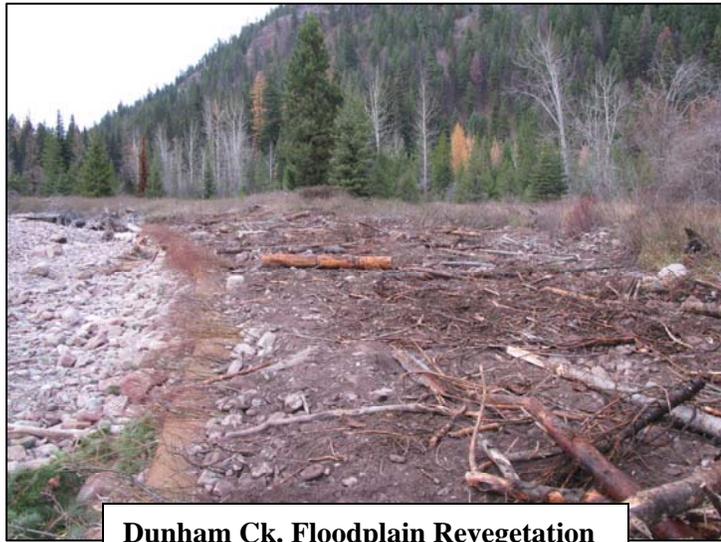


## 2008 Watershed Improvement Tracking Lolo National Forest

### Executive Summary

This report summarizes the 2008 watershed improvement activities shown in Table 1. Projects are displayed by watershed and fisheries priority, Region One Integrated Restoration Strategy Tiers, and funding mechanism. This effort updates our “10-yr Watershed Rehabilitation Summary, Watershed Improvement Tracking, Lolo National Forest (LNF), 1996-2006 and 2007 documents. Unfinished projects with completed environmental assessment are also provided.

The LNF decommissioned over 83 miles of road in 2008 (Table 1). Projects were all non-timber sale related. Over 1/3 of roads decommissioned were classified roads (36%) compared to 64% unclassified roads. Primary funding sources for road decommissioning include watershed management (78%), wildfire suppression BAER (15%), and partnership funds (7%). Since 1996, approximately 871 miles of roads have been decommissioned with associated stream crossing rehabilitation at every drainage crossing.



**Dunham Ck. Floodplain Revegetation**

Activity	2008 Total	Total since 1996
Road Closure and Decommissioning	83.1 miles 47 crossing removals	871 miles 376 crossing removals
Stream Rehabilitation	0.1 miles (+ 3 miles of LWD Placement)	4.5 miles
Road-Stream Crossing Replacements	10 replacements (1 bridge)	63 replacements
Mining Rehabilitation	0 mine site reclamation	7 mine site reclamations
Water Diversions	2 fish screens	10 removal, rehab, or fish screens
Recreation-Related Rehabilitation	0 projects (removal of 12 user-created dispersed sites)	13 projects
Miles of Fish Habitat Made Available	Culvert Replacements: 18 miles Culvert Removals: 10 miles Diversion Rehabilitation: 6 miles Total: 34 miles	Culvert Replacements: 208 mi. Culverts Removals: 138 miles Diversion Rehabilitation: 19 mi. Total: 366 miles

Many streams have been degraded through past activities such as mining, grazing, riparian harvest, and roads. In 2008, approximately 100 feet of stream rehabilitation occurred, providing 30 habitat structures. Wildlife and fisheries management funded over 70 percent of projects costs with the

remainder funded by partnerships. Partners in 2008 include: Trout Unlimited National, Big Blackfoot Chapter of Trout Unlimited and Sanders County RAC.

Table 2 displays projects as they occur in Region 1 Integrated Restoration Strategy watersheds, which are stratified in tiers that relate to the degree of multiple project integration. Tier 1 watersheds more closely meet strategy goals of integrating high-value and resilient watershed and vegetation restoration with maintenance and restoration of wildlife and aquatic habitats and protection of people and infra-structure in wildland-urban interface zones. Tier 5 is least associated with the Integrated Restoration Strategy.

**Table 2. 2008 Project Summary by Region 1 Integrated Restoration Strategy Watersheds**

Projects *	Tier 1	Tier 2	Tier 3	Tier 4	Tier 5	NA
11	3	6	0	0	2	1

\*some projects occur in more than one tier designation.

Table 3 displays projects Forest aquatic priority watersheds: priority bull trout, State designated water quality limited (WQL) watersheds, and municipal watersheds.

**Table 3. 2008 Project Summary by Aquatic priority watersheds**

Projects	Bull Trout Priority	WQL streams	Municipal
11	6	8	0

Road-stream crossing removal and/or replacement may occur as distinct projects or accompany larger road closure or decommissioning projects. Project goals are to reduce road maintenance and sediment delivery, improve aquatic species passage, maximize structure life, and optimize public safety. In 2008, 37 stream crossings were removed and over 6 miles of upstream aquatic habitat became available. Primary funding sources for culvert removals include vegetation and watershed management (67%), timber management (14%), cooperative work-KV (11%), and partnership funds (5%). Since 1996, approximately 329 stream crossings have been removed and over 128 miles of upstream habitat have become available to aquatic species.

Unimproved water diversions and ditches often result in fish loss, blockage of aquatic movement, and impaired stream function. In 2008, 2 fish screens were installed on Stony & Dick Creek. Since 1996, at least 400 feet of stream impacted by ditches has been rehabilitated with 13 miles of habitat gained. Installation of 6 high priority fish screens has greatly decreased fish loss to ditches.

Eight projects have completed environmental analysis and await contract preparation and funding. If implemented these projects would reconstruct approximately 139 road miles, decommission about 431 miles, and remove 105 fish-impacting culverts, 117 other culverts and make 49 miles of habitat available.

WIT Report Authors: Jennifer Mickelson, West Zone Fisheries Biologist  
Traci Sylte, Forest Soil and Water Program Manager

## Section 1.0 Forest Summary

This document presents summaries and highlights of 2008 watershed rehabilitation activities on the Lolo National Forest (LNF). Annual watershed improvements are available on line at: <http://www.fs.fed.us/r1/lolo/resources-natural/>.

‘Watershed rehabilitation’ describes many activities that improve watershed conditions (Table 1). Road reconstruction, vegetation management, ecosystem burning, among other activities also improve watershed conditions, but are not a focus of this effort. Although efforts have focused on accuracy, some projects may have been omitted or totals may vary depending on the specific data compiled.



**Figure 1. Cedar Creek In-stream Large Wood Replacement Phase 2 – Superior RD**

**Table 1. 2008 Watershed Improvement Projects**

Activity	2008 Subtotal	Total (Since 1996)
Road Decommissioning Crossings Removed:	83.1 miles (all closure types) 47 removals	871 miles (all closure types) 376 removals
Stream Rehabilitation	0.1 miles (+ 3 miles of LWD placement)	4.5 miles
Road-Stream Crossing Replacements	10 replacements (1 bridge)	63 replacements
Mining Rehabilitation	0 mine site reclamations	7 mine site reclamations (6 on active streams)
Water Diversions	2 projects	10 removal, rehab, or fish screen projects
Recreation-Related	0 projects	13 projects (primarily OHV Rehab projects)
Miles of Fish Habitat Made Available	Culvert Replacements: 18.5 miles Culverts Removed: 10.5 miles Diversion Rehabilitation: 6.2 miles	Culvert Replacements: 208.5 miles Culverts Removed: 138.1 miles Diversion Rehabilitation: 19.2 miles Total: 365.8 miles

## Section 2.0 – Rehabilitation Activity Summaries

### 2.1 Road Decommissioning Projects

Closed or decommissioned roads can exist in a variety of states depending on multiple resource considerations. Refer to the LNF Road Closure and Decommissioning Protocols and Guidelines for details.

*Road decommissioning never eliminates access – it only changes it.*

The tables below list 2008 road decommissioning by District and closure type.

**Table 2. 2008 Road Decommissioning by District and Closure Type**

District	Closure Level	2008 Miles	Total Miles	District	Closure Type	2008 Miles	Total Miles
<b>Missoula</b>	1	0.0	43.1	<b>Ninemile</b>	1	0	14.93
	2	0.0	7.4		2	0	80.97
	3	36.6	58.3		3	0	193.67
	3N	18.4	29.5		3N	0	14.86
	4	5.8	10.0		4	0	2.51
	5	4.1	13.8		5	0	10.39
	Uncertain closure type	0.0	0.0		Uncertain closure type	0	6.98
	<b>TOTAL</b>	<b>64.9</b>	<b>162.1</b>		<b>TOTAL</b>	<b>0.0</b>	<b>324.3</b>

District	Closure Level	2008 Miles	Total Miles	District	Closure Level	2008 Miles	Total Miles
<b>Plains/ Thompson Falls</b>	1	0	38.1	<b>Seeley Lake</b>	1	0	12.3
	2	0	24.6		2	0	16.4
	3	9.6	31.4		3	0	60.3
	3N	1.5	1.9		3N	0	5.5
	4	0	13.4		4	0	8.3
	5	2.9	23.3		5	4.1	26.3
	Uncertain closure type	0	2.4		Uncertain closure type	0	0.2
	<b>TOTAL</b>	<b>14.0</b>	<b>135.1</b>		<b>TOTAL</b>	<b>4.1</b>	<b>140.4</b>

District	Closure Level	2008 Miles	Total Miles
<b>Superior</b>	1	0	11.53
	2	0	10.85
	3	0	23.22
	3N	0	0
	4	0	42.34
	5	0	9.62
	Uncertain Closure Type	0	23.20
	<b>TOTAL</b>	<b>0.0</b>	<b>120.8</b>

Table 3 lists approximations of annual closure and decommissioning since 1995.

**Table 3. Annual LNF Road Decommissioning**

<b>Year</b>	<b>Total Miles Decommissioned</b>
1995	16.9
1996	103.6
1997	51.5
1998	16.5
1999	46.5
2000	35.1
2001	32.2
2002	9.8
2003	2.7
2004	95.9
2005	158.2
2006	17.1
2007	51.6
2008	83.1



*Figure 2. Upper Lolo Road Decommissioning – Missoula Ranger District*

Table 4 displays District 2008 percentages of classified (system) and unclassified (non-system) road decommissioned.

**Table 4. Percentage of Classified & Non-Classified Roads Decommissioned by District**

<b>District</b>	<b>Classified Roads</b>	<b>UnClassified Roads</b>
Missoula	28.0%	72.0%
Ninemile	0.0%	0.0%
Plains/Thompson Falls	67.0%	33.0%
Seeley Lake	58.0%	42.0%
Superior	0.0%	0.0%

Table 5 shows road decommissioning funding since 1996. Some inaccuracies exist, especially in older data; therefore, these values are best used for general trends. Timber-related projects have funded most road decommissioning projects in the last 12 years. Watershed management and BAER money have also funded a large portions. In 2008 however, watershed management funded over 78% and timber management funded none.

**Table 5. Road Decommissioning Funding Sources**

<b>Fund Code</b>	<b>Decommissioning (1996-2007)</b>	<b>Percentage (1996-2007)</b>	<b>Decommissioning (2008)</b>	<b>Percentage (2008)</b>
Salvage Sales (SSSS)	212.6	37.1	0	0
Timber Management (NFTM)	114.3	20.0	0	0
Vegetation & Watershed Management (NFVW)	92.2	16.1	64.9	78.2
National Forest Restoration (NFN3)	72.7	12.7	0	0
Wildfire Suppression BAER (WFSU)	25.7	4.5	12.6	15.2
Road Maintenance (CMRD)	23.8	4.2	0	0
Watershed Improvement (NFSI)	13.5	2.3	0	0
Knutsen-Vandenberg (CWKV)	13.5	2.3	0	0
Partnership Funds (NFEX)	3.1	0.6	5.5	6.6
Wildlife & Fisheries (NFWF)	1	0.2	0	0

Table 6 lists 2008 crossings removals by District. Stream crossing removal is an important component of road decommissioning. Rehabilitated crossings eliminate sediment sources and gain important access fish and other organisms such as pearl shell mussels and salamanders. Culvert removal quantities are generated by GIS. Fish-bearing streams are separated from non-fish bearing streams (gradients exceeding 25%). Values are reasonably accurate, although some error is certain.

**Table 6. 2008 Road-Stream Crossing Removal by District (fish & non-fish bearing streams)**

<b>District</b>	<b>Number Fish-Bearing Crossings Removed</b>	<b>Number Non Fish-Bearing Crossings Removed</b>	<b>Total Crossings Removed in 2008</b>	<b>Total Crossings Removed (since 1996)</b>
<b>Missoula</b>	25	12	37	73
<b>Ninemile</b>	0	0	0	137
<b>Plains/Thompson Falls</b>	0	5	5	45
<b>Seeley Lake</b>	1	4	5	55
<b>Superior</b>	0	0	0	66
<b>Total</b>	<b>26</b>	<b>21</b>	<b>47</b>	<b>376</b>

In 2008, a majority of culvert removals were funded by watershed management. Partnership and BAER funds paid for a smaller portion (Table 7). The Missoula Ranger District had the most miles of upstream usable habitat opened because of the Upper Lolo Decommissioning Project decommissioned over 60 miles of road and removed 25 culverts on fish bearing streams.

**Table 7. Miles of Upstream Habitat Made Available by Culvert Removals in 2008**

District	Miles of Upstream Habitat Made Available in 2008	Total Miles of Upstream Habitat Made Available (since 1996)
Missoula	10.2	32.5
Ninemile	0.0	37.1
Plains/Thompson Falls	0.0	17.9
Seeley Lake	0.3	18.5
Superior	0.0	32.6
<b>Total</b>	<b>10.5</b>	<b>138.5</b>

## Section 2.2 Culvert and Bridge Replacements

Numerous road/stream crossings on the LNF are undersized, impede aquatic organism passage, and/or deliver either chronic or episodic amounts of sediment to stream systems. In the last 12 years, many crossings have been upgraded to larger structures, such as bridges, open-bottom arches, and pipe arches using a stream simulation design approach. Table 8 displays the number of replacements by District. Appendix 5.3 provides maps.

**Table 8. Total Number of Culvert Replacements by District**

District	2008 Culvert Replacements	Total (Since 1996)
Missoula	6	15
Ninemile	0	13
Plains/Thompson Falls	1	5
Seeley Lake	2 (+ 1 bridge replacement)	13
Superior	0	17
<b>Forest Total</b>	<b>9</b>	<b>64</b>

The majority of culverts replaced in 2008 were funded through partnership dollars or BAER. For specific details on crossing replacements for each district, refer to the section on Individual Project Summaries.

Table 8 below displays the total number of miles of usable fish habitat made available (numbers assume that fish are moving at stream gradients less than 25%).

**Table 8. Miles of Upstream Usable Habitat Made Available by Crossing Replacements**

District	2008 Miles Made Available	Total Miles Made Available (Since 1996)
Missoula	12.1	54.4
Ninemile	0.0	48.3
Plains/Thompson Falls	4.0	24.7
Seeley Lake	2.4	33.9
Superior	0.0	49.0
<b>Total</b>	<b>18.5 miles</b>	<b>211.3 miles</b>

The Missoula Ranger District had the most miles of upstream habitat gained in 2008 – the two culvert replacements in Rock Creek opened nearly half of the 12.1 miles gained. Approximately four miles of upstream habitat was opened on the North Fork Little Thompson River on the Plains/Thompson Falls R.D. Two culverts were replaced within the Jocko Fire on the Seeley Lake Ranger District, opening 1.2 miles each.

Table 9 displays the number and type of crossing structures used and an average cost. A percentage of the total number of culvert replacements on the forest is also displayed.

**Table 9. Crossing Replacement Structures and Average Cost**

Culvert Replacement Structure	Number Used in 2008 on Forest	Number Used on Forest	Percentage of Total	Average Cost in 2008	Average Cost (since 2006)
Box Culvert	0	3	4.8%	N/A	\$17,086
Bridges	3	27	42.2%	\$79,719	\$80,931
Circular Culvert	1	4	6.3%	\$48,532	\$24,041
Open-Bottom Arch	1	4	6.3%	\$59,166	\$83,250
Pipe Arch	4	22	34.4%	\$27,428	\$23,370
<b>Total</b>	<b>9</b>	<b>64</b>	<b>100%</b>	<b>Average Cost: \$53,711</b>	<b>Average Cost: \$45,735</b>

Bridges remain the most common replacement structure (over 42 percent), followed by pipe arches (34%). Bridges and bottomless arches total over 50% of the replacement structures, which is an important consideration because these structures allow a natural stream bottom, which is the best of all replacement options for both aquatic migration and stream dynamics.

Table 10 shows funding sources for crossing replacements. Funding was not attributed to every culvert replacement due to incomplete information; therefore, these values are best used for general estimates and trend assessment. Only projects of high certainty are entered.

**Table 10. Funding Sources for Culvert Replacements from 1996 – 2007 and 2008**

<b>Fund Code</b>	<b>Percentage of Culvert Replacements from 1996-2007</b>	<b>Percentage of Culvert Replacements in 2008</b>
Salvage Sales (SSSS)	8	0
Timber Management (NFTM)	47	0
National Forest Restoration (NFN3)		0
Wildfire Suppression BAER (WFSU)	22	22
Road Maintenance (CMRD)	0.5	11
Partnership Funds (NFEX)	9	45
Minerals and Geology Management (NFMG)	1	0
10% Road and Trail Fund (TRTR)	0.5	22
Hazardous Fuels Reduction (WFHF)	8	0
Wildlife & Fisheries Management (NFWF)	4	0

In 2008, most replacements were funded through partnership funds (45%). This differs from other years where timber sales funded a large portion of culvert replacements. The average cost for a culvert replacement was approximately \$53,711 in 2008, compared with \$45,735 between 1996 and 2007. Partners were the Trout Conservancy and Plum Creek Timber Company.

Table 11 displays the total number of miles of upstream habitat made available from both crossing removals and replacements.

**Table 11. Upstream Habitat Made Available by Crossing Replacements and Removals**

<b>District</b>	<b>Miles of Upstream Usable Habitat Made Available in 2008</b>	<b>Total Miles of Upstream Usable Habitat Made Available</b>
Missoula	22.3	86.9
Ninemile	0.0	86.4
Plains/Thompson Falls	4.0	42.6
Seeley Lake	2.7	52.4
Superior	0.0	81.6
<b>Total</b>	<b>29.0 miles</b>	<b>330.2 miles</b>

**Section 2.3 Stream Rehabilitation Projects**

Many streams on the Forest have been degraded through past activities such as mining, grazing, riparian harvest, riparian roads, etc. Table 12 includes all stream rehabilitation and habitat enhancement projects, including riparian planting and fencing. Stream rehabilitation associated with mining reclamation and stream diversion work is addressed in another section.

**Table 12. Stream Rehabilitation Projects on the Lolo National Forest**

<b>Stream Restoration Project</b>	<b>District</b>	<b>Year</b>	<b>Treatments</b>	<b>Total Habitat Structures</b>	<b>Acres Treated</b>	<b>Linear Feet Treated</b>
<b>Sunset Mine Reclamation</b>	07	1991	Abandoned Mine Restoration, including Riparian Planting		2	
			Streambank Stabilization			500
<b>Puyear Stream Restoration Project</b>	03	1997	Stream Relocation & Restoration w/ Rootwad, Log or Boulder Placement			2800
<b>Lost Park Creek Log Crossing Removal</b>	03	1997	Stream Channel Stabilization w/ Migration Barrier Removal			100
<b>Savenac Creek Stream Restoration</b>	07	1998	Stream Channel Relocation Rootwad, Log & Boulder Placement			550
<b>St. Regis Streambank Stabilization</b>	07	1998	Streambank Stabilization			50
<b>Ward Creek Flume Removal</b>	07	1998	Flume Removal	1		
<b>Holloman Creek (2 sites)</b>	03	1999	Streambank Stabilization			80
<b>Holloman Creek (2 sites)</b>	03	2005	Streambank Stabilization			80
<b>Spring Restoration – Tributary to Miller Creek</b>	03	1999	Riparian Planting		0.1	
<b>Tarbox Mine Reclamation Project</b>	07	2002	Stream Channel Stabilization			748
<b>Nancy Lee Mine Reclamation</b>	07	2002	Stream Channel Stabilization & Restoration, Mine Spoil Reclamation			1550
<b>Dunham Creek Stream Restoration</b>	06	2003	Stream Channel Restoration			6200
			Riparian Planting		20	
			Grade Control Structures	25		
<b>Dry Creek Diversion Dam Removal</b>	07	2004	Weirs or sills	3		
<b>Fish Creek Complex</b>	04	2004	Riparian Planting		10	

Watershed Improvement Tracking 2008

<b>Riparian Restoration</b>						
<b>Teepee Creek Culvert Removal</b>	05	2004	Weirs or sills	3		
<b>Daisy Creek Stream Restoration Project</b>	05	2005	Stream Channel Relocation & Rootwad, Log & Boulder Placement			1020
			Grade Control Structures	35		
<b>West Fork Big Creek Restoration</b>	07	2005	Grade Control Structures	12		
			Rootwad, Log & Boulder Placement			370
			Streambank Stabilization			360
			Riparian Planting		1.5	
<b>Eustache Creek Stream Rehabilitation</b>	04	2006	Stream Channel Restoration, including wood placement, grade control & channel stabilization			6864
<b>Graves Creek Stream Relocation</b>	03	2006	Stream Relocation & Streambank Stabilization w/ Rootwad, Log & Boulder Placement			100
<b>Lolo Creek Enhancement Project</b>	03	2006	Grade Control Structures	12		
			Stream Channel Stabilization			800
<b>Rock Creek Large Woody Debris Placement</b>	03	2006	Large Wood Replacement	10		
<b>Cedar Creek Instream Wood Replacement</b>	07	2007	Large Wood Placement	22		
<b>Deep Creek Dam Removal</b>	07	2007	Rootwad, Log and Boulder Placement			130
			Grade Control Structures	10		
<b>Crow Creek BPA Powerline Stream Restoration Project</b>	05	2007	Rootwad, Log and Boulder Placement, including Stream Channel Stabilization			1000
			Weirs or Sills	7		
			Large Wood Replacement	11		
			Transplant Vegetation		2	
<b>Prospect Creek Bridge Abutment Removal</b>	05	2008	Bank Shaping and Planting, Stream Channel Stabilization & Rootwad, Log and			100

			Boulder Placement			
<b>Cedar Creek Instream Wood Replacement #2</b>	07	2008	Large Wood Placement	30		
<b>Totals:</b>				<b>181</b>	<b>35.6 acres</b>	<b>23,402 feet</b>

Approximately 100 feet of stream was rehabilitated was rehabilitated in 2008. Projects consisted of streambank stabilization, relocation, and large wood placement for habitat enhancement (the Cedar Creek Instream Wood Replacement Project #2 added large woody debris to approximately 3 miles of Cedar Creek). Since 1996, the Lolo National Forest has rehabilitated about 23,402 feet. Within the various stream rehabilitation projects, 30 habitat structures were placed in 2008, equaling over 180 installed since 1996.



*Figure 3. Prospect Creek Bridge Abutment Removal – Plains/Thompson Falls R.D.*

Table 13 displays the habitat structures, acres and linear feet of stream rehabilitation by District.

**Table 13. Acres & Feet of Stream Restoration by District**

District	Acres of Rehab in 2008	Total Acres of Rehab.	Feet of Rehab. In 2008	Total Feet of Rehab.	Habitat Structures Installed in 2008	Total Habitat Structures Installed
Missoula	0.0	0.10	0.0	3960	0	22
Ninemile	0.0	10.0	0.0	6864	0	0
Plains/Thompson Falls	0.0	2.0	100	2120	0	56
Seeley Lake	0.0	20.0	0.0	6200	0	25
Superior	0.0	3.5	0.0	4258	30	77
<b>Total</b>	<b>2.0</b>	<b>35.6</b>	<b>100</b>	<b>23,402</b>	<b>30</b>	<b>181</b>

In 2008, approximately \$13,900 was allocated to stream rehabilitation projects (Table 14). Costs were not available for several older projects, but at least \$1,816,985 has been allocated to stream rehabilitation projects since 1996. Figures 6 and 7 display these funding sources for 2008, as well as prior year totals. Refer to the Individual Project Summaries sections for specific project details. Fish and wildlife funded approximately 72% with partners funding the remainder. Partners in 2008 were Sanders County RAC and the Big Blackfoot Chapter of Trout Unlimited.

**Table 14. Funding Sources for Culvert Replacements from 1996 – 2007 and 2008**

Fund Code	Percent Funding 1996-2007	Percent Funding 2008
Timber Management (NFTM)	5	0
National Forest Restoration (NFN3)	3	0
Partnership Funds (NFEX)	56	28
Minerals and Geology Management (NFMG)	6	0
Vegetation & Watershed Management (NFVW)	25	0
Wildlife & Fisheries Management (NFWF)	5	72

### Section 2.4 Mining Reclamation

The Lolo National Forest has a long history of mining across many parts of the Forest, including the St. Regis River, Cedar Creek, Trout Creek, and Ninemile Creek. Table 15 displays information on mine reclamation projects since 1996. Although planning is underway, no active reclamation occurred in 2008. Sites mostly represent abandoned placer mines, where mining has impacted stream and streambank stability, coarse and fine sediment delivery, large woody debris loading, aquatic habitat, riparian vegetation rigor and composition, and floodplain connectivity.

**Table 15. Mine Reclamation Projects on the Lolo National Forest**

Project	Watershed	District	Year	Treatments	Amount Treated	Total Cost
<b>Sunset Mine Reclamation</b>	Sunset Creek (South Fork Little Joe Creek)	07	1991	Abandoned Mine Restoration, including Riparian Planting	2 acres	Unclear
				Streambank Stabilization	500 feet	Unclear
<b>Tarbox Mine Reclamation</b>	Tributary to Packer Creek (St. Regis River)	07	2002	Stream Channel Stabilization	748 feet	Unclear
				Mine Spoil Rehabilitation	2000 feet	Unclear
<b>Nancy Lee Mine Reclamation</b>	Keystone Creek (M. Clark Fork R)	07	2002	Stream Channel Stabilization	1550 feet	\$555,105
				Mine Spoil Rehabilitation	1550 feet	
<b>Daisy Creek Stream Restoration</b>	Daisy Creek (Tributary to Prospect Creek)	05	2005	Stream Channel Relocation & Rootwad, Log & Boulder Placement	1020 feet	\$5,650
<b>Eustache Creek Stream Rehabilitation</b>	Eustache Creek (Tributary to Ninemile Creek)	04	2006	Channel reconstruction, wood placement, transplants	6864 feet	\$68,515
<b>Ward Lode Reclamation</b>	Dick Creek (Trib to Lolo Ck)	03	1997	Hillslope, tailing, erosion, adit rehab	~5 acres	unclear
<b>Deep Creek Dam Removal &amp; Stream Restoration Project</b>	Deep Creek (Trib to Trout Creek)	07	2007	Mining dam removal, Stream Channel Restoration and Rootwad, Log & Boulder Placement	130 feet	\$13,005

## Section 2.5 Water Diversions

The Lolo National Forest borders substantial portions of private land having water rights, which has resulted in many water diversions and ditches typically managed through Special Use Permits. Water diversion projects generally involve issues involving a diversion point and an irrigation ditch. Projects have been completed on both Forest and private land (private land by Wyden authority) and include primarily flume and dam removals and fish screen installations (Table 14). Individually and cumulatively, diversions often negatively affect fish and stream resources. Unscreened diversions often result in fish loss to ditches where either undesirable habitat or fish fatality occurs. Diversion structures commonly prevent upstream aquatic species movement and impede proper stream function.

Since 1996, five fish screens have been installed and two diversions have been removed. Approximately 400 feet of stream restoration has resulted from irrigation related projects and at least 20 miles of upstream habitat has been gained from the removal of the Dry Creek diversion, Deep Creek Dam Removal, and the Cottonwood Creek Irrigation Diversion Removal projects. The fish screens on Rattlesnake Creek, Stony Creek, Dick Creek & Dunham Creek have greatly decreased the amount of entrained fish in irrigation ditches.

**Table 14. Irrigation-Relation Rehabilitation Projects on the Lolo National Forest**

<b>Irrigation Projects</b>	<b>Watershed</b>	<b>District</b>	<b>Year</b>	<b>Treatments</b>	<b>Treatment Quantity</b>	<b>Total Cost</b>
<b>Fort Fizzle Ditch Abandonment and Rehabilitation</b>	Lolo Creek (Bitterroot River)	03	2004	Headgate Removal and Ditch Rehabilitation	Approx. 800 feet	Approx. \$2,000
<b>Ward Creek Flume Removal</b>	Ward Creek (Tributary to St. Regis River)	07	1998	Flume Removal & Placement of Weirs	Approx. 200 feet	Unknown
<b>Dry Creek Diversion Dam Removal</b>	Dry Creek (Middle Clark Fork)	07	2004	Diversion Dam Removal & Placement of Weirs	200 feet (Allowed access to 12.8 miles of habitat)	\$18,497
<b>Rattlesnake Creek Fish Screens</b>	Rattlesnake Creek	03	2004	Placement of Fish Screens	2 screens	Unknown
<b>Stony Creek Fish Screen</b>	Stony Creek (Tributary to Ninemile Creek)	04	2005	Placement of Fish Screen	1 screen	Unknown
<b>Dunham Creek Fish Screen</b>	Dunham Creek (Tributary to Monture Creek)	06	2003	Placement of Fish Screen	1 screen	Unknown
<b>Lower Stony Creek Fish Screen</b>	Stony Creek (Tributary to Ninemile Creek)	04	2007	Placement of Fish Screen	1 screen	\$8,000
<b>Dick Creek Stream Rehabilitation</b>	Disk Creek (Tributary to Monture Creek)	06	2007	Placement of Coanda-Style Fish Screen	1 screen	\$121,776
<b>Cottonwood Creek Irrigation Diversion Removal</b>	Cottonwood Creek (Tributary to Blackfoot River)	06	2008	Removal of 2 Irrigation Diversions	2 removals (Allowed access to 6.25 miles of habitat)	\$15,400

## **Section 2.6 Recreation and Special Uses Rehabilitation**

Forest recreation and special uses on the Forest encompasses a wide variety of activities. This summary only addresses rehabilitation projects associated with unauthorized OHV use and grazing. Other recreational rehabilitation projects such as trail relocation and rehabilitation are not summarized in this report.

Unauthorized OHV and grazing impacts commonly affect streambanks, riparian zones, and wetlands. Many allotments interface with riparian areas with overgrazing of streambank vegetation and bank trampling causing varied degrees of impact. Although planning is underway, no active reclamation occurred in 2008.

In the last 20 years on the Lolo National Forest, approximately 13,851 feet of riparian fencing has been placed to either deter recreational or grazing uses within the riparian area. This equates to approximately 2.6 miles of riparian fencing. Approximately 460 feet of stream restoration has taken place to rehabilitate areas impacted from ATV's.

## **Section 2.7 Integrated Restoration Strategy**

The Northern Region Integrated Restoration and Protection Strategy aims to assist planning efforts by stratifying and prioritizing watersheds into various extents of multiple resource needs. This Strategy focuses on the integration of the following:

- Restoration and maintenance of high value watersheds in a properly functioning condition.
- Restoration and maintenance of wildlife habitats, including restoration of more resilient vegetation conditions where appropriate, to meet ecological and social goals.
- Protection of people, structures and community infra-structure (roads, bridges, and power corridors,) in and associated with the wildland-urban interface (WUI).

Table 15 displays the 2008 watershed improvement projects in relation to the Integrated Restoration Strategy (IRS). Tier 1 areas are those that most closely meet the IRS; Tier 5 is least associated with the IRS. Appendix 5.9 displays detailed information and charts. See Appendix 5.7 for maps.

In 2008, 35% of road decommissioning miles occurred within Integrated Restoration Strategy Tier 1. An additional 51% of road decommissioning occurred in Tier 2, leaving only 14% left to Tier 5 of not within the Integrated Restoration Strategy.

**Table 15. 2008 Watershed Improvements in Relation to Integrated Restoration Strategy**

Project Name	District	Tier 1	Tier 2	Tier 3	Tier 4	Tier 5	Not Within Strategy
Upper Lolo Road Decommissioning & Culvert Replacements	D3	X	X				
Mud Creek FRTA Culvert Replacement	D3		X				
Rock Creek Fuels Reduction Culvert Replacement	D3	X					
Chippy Fire BAER Road Decommissioning	D5					X	X
North Fork Little Thompson River Culvert Replacement	D5						X
Wee Tee Pee Road Decommissioning	D5		X			X	
Prospect Creek Bridge Abutment Removal Project	D5		X				
Jocko Fire BAER Road Decommissioning & Culvert Replacements	D6		X				
Seeley Fuels Bridge Replacement	D6		X				
Cottonwood Creek Irrigation Diversion Removals	D6	X					
Cedar Creek LWD Placement Project – Phase 2	D7	X					

Figure 4 displays the number of miles of road decommissioning within each Integrated Restoration Strategy Tier in 2008.

**Figure 4. Road decommissioning by IRS Tiered Watersheds.**

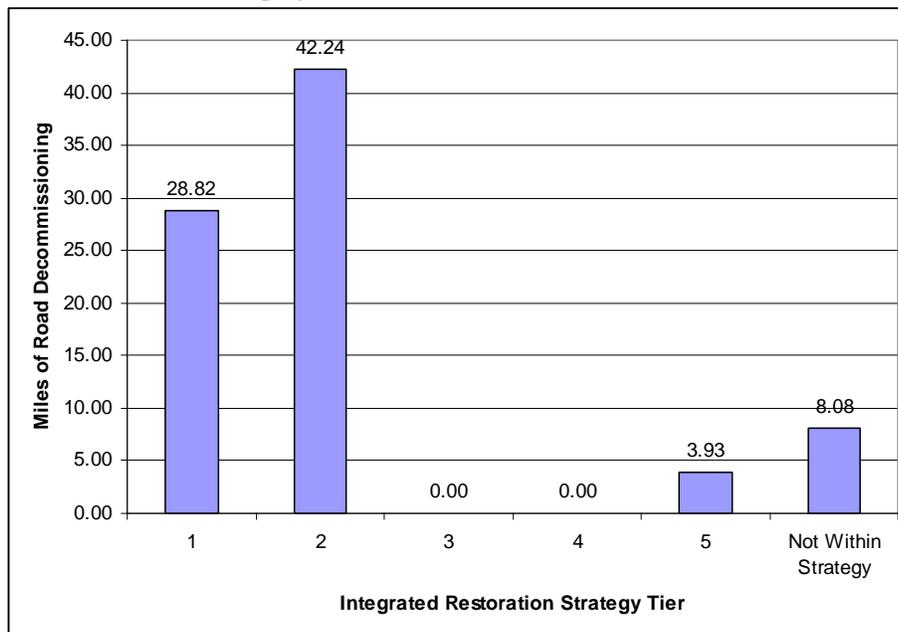


Figure 6 displays road decommissioning by IRS Tiers since 1996.

**Figure 6. Total miles of road decommissioning within Integrated Restoration Strategy since 1996.**

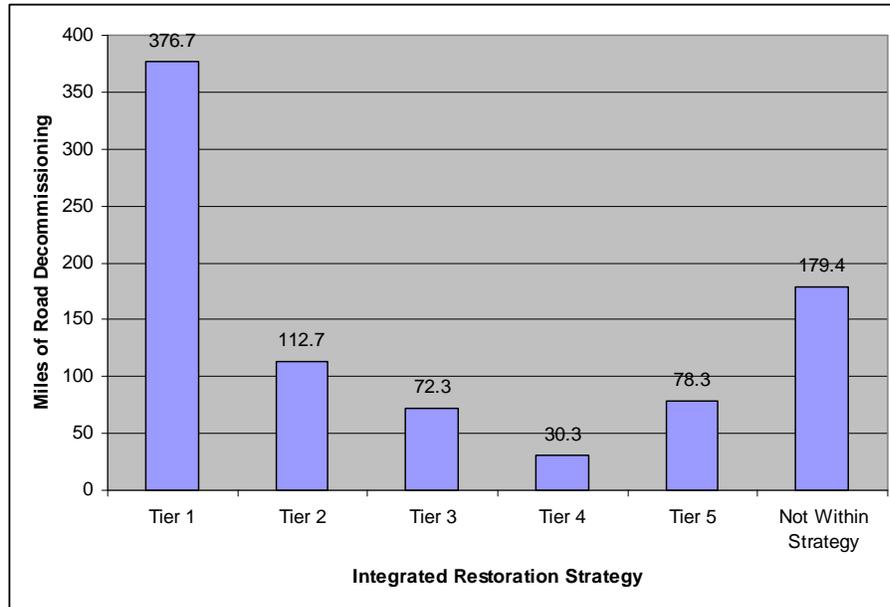
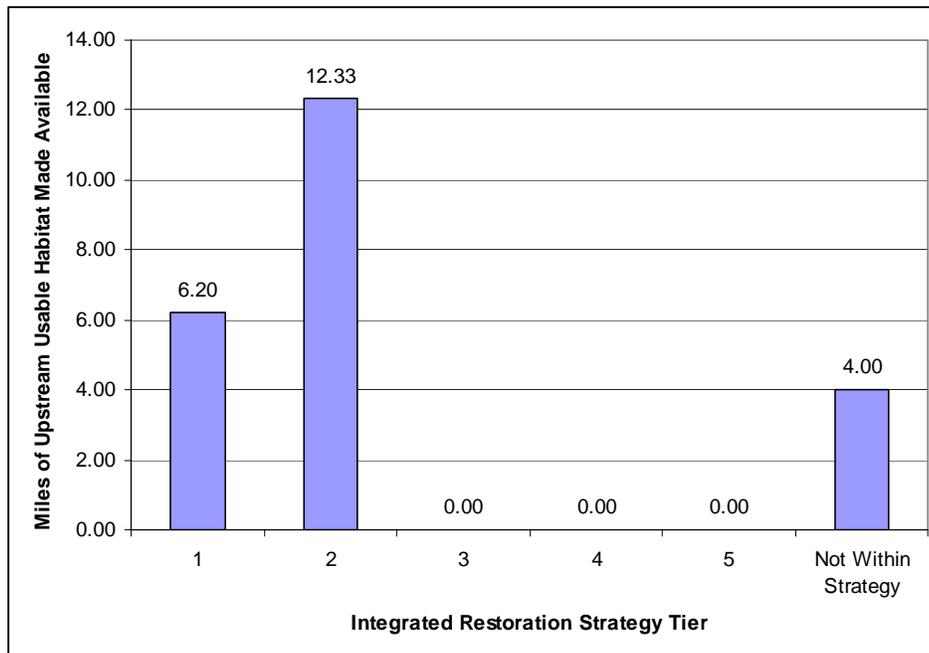


Figure 7 displays the number of miles of upstream usable habitat made accessible through culvert removals and replacements within each Integrated Restoration Strategy Tier in 2008.

**Figure 7. Miles of Upstream Usable Habitat Made Available within Integrated Restoration Strategy in 2008**



In 2008, approximately 27% of upstream usable habitat made available occurred within Integrated Restoration Strategy Tier 1, while 55% occurred within Tier 2. There were no miles made accessible in Tiers 3, 4 and 5. Four miles were opened in an area not within the integrated restoration strategy.

### Section 2.8 Bull Trout Priority Watersheds

Priority watersheds were designated by watershed and fisheries specialist through the following criteria outlined in the 1995 Inland Native Fish Strategy (INFISH): 1) Watersheds with excellent habitat or strong assemblages of inland native fish, within priority on bull trout populations; 2) Watershed that provide for meta-populations objectives; 3) Degraded watersheds with a high restoration potential. The intent of designating priority watersheds is to provide a pattern of protection across the landscape where habitat for inland native fish would receive special attention and treatment. Priority watersheds would have the highest priority for restoration, monitoring, and watershed analysis. A Special Emphasis Watershed is a watershed that meets any one of the habitat or subpopulation criteria. Special Emphasis Watersheds are treated the same as priority watersheds for restoration, monitoring, and watershed analysis.

Table 16 displays the projects implemented in 2008 by priority watershed. Appendix 5.6 displays priority bull trout watersheds.

**Table 16. 2008 Watershed Improvements in Relation to Bull Trout Priority Watersheds**

Project Name	District	Within Priority Watershed	Within Special Emphasis Watershed
Upper Lolo Road Decommissioning & Culvert Replacements	D3		X
Mud Creek FRTA Culvert Replacement	D3		X
Rock Creek Fuels Reduction Culvert Replacement	D3	X	
Chippy Fire BAER Road Decommissioning	D5		
North Fork Little Thompson River Culvert Replacement	D5		
Wee Tee Pee Road Decommissioning	D5		
Prospect Creek Bridge Abutment Removal Project	D5	X	
Jocko Fire BAER Road Decommissioning & Culvert Replacements	D6	X	
Seeley Fuels Bridge Replacement	D6	X	
Cottonwood Creek Irrigation Diversion Removals	D6	X	
Cedar Creek LWD Placement Project – Phase 2	D7	X	

Of the eleven projects implemented in 2008, six were implemented within bull trout priority watersheds and an additional two were implemented within “special emphasis” watersheds. Three improvement projects were not within a bull trout priority watershed.

In 2008, 81% of road decommissioning and 70% of available habitat gain occurred in either a bull trout watershed or a special emphasis watershed. All stream and irrigation-related rehabilitation projects occurred within bull trout priority watersheds.

### Section 2.9 Water Quality Limited Watersheds (TMDL)

The State has determined many watersheds on the LNF to be “water quality limited” (WQL). Table 17 displays the 2008 watershed improvements these watersheds. See Appendix 5.8 for maps of WQL watersheds.

Nearly 74 of the 83 miles of road decommissioning that took place in 2008 was implemented in a TMDL watershed (or approximately 89%). 43 of 47 culvert removals in 2008 took place within a TMDL watersheds. All culvert replacements occurred within a TMDL watershed. The entire 29 miles of upstream usable habitat made available in 2008 occurred within a TMDL watershed.

**Table 16. 2008 Watershed Improvements in WQL Watersheds**

Project Name	District	WQL Watershed
Upper Lolo Road Decommissioning & Culvert Replacements	D3	X
Mud Creek FRTA Culvert Replacement	D3	X
Rock Creek Fuels Reduction Culvert Replacement	D3	X
Chippy Fire BAER Road Decommissioning	D5	
North Fork Little Thompson River Culvert Replacement	D5	X
Wee Tee Pee Road Decommissioning	D5	
Prospect Creek Bridge Abutment Removal Project	D5	X
Jocko Fire BAER Road Decommissioning & Culvert Replacements	D6	X
Seeley Fuels Bridge Replacement	D6	X
Cottonwood Creek Irrigation Diversion Removals	D6	
Cedar Creek LWD Placement Project – Phase 2	D7	X

## 2.10 Municipal Watersheds

The Lolo National Forest has two municipal watersheds: Ashley and Flat Creek on the Plains/Thompson Falls and Superior Ranger Districts, respectively. No watershed improvement projects were implemented in these municipal watersheds in 2008.

## 2.11 Primary Funding Mechanism for NEPA

<b>Project Name</b>	<b>Primary Funding Mechanism</b>
Upper Lolo Restoration	NFVW
Rock Creek Fuels Reduction	WFHF
Chippy Fire BAER	No NEPA required
North Fork Little Thompson Culvert Replacement	No NEPA required
Wee Tee Pee Timber Sale	NFTM
Prospect Bridge Abutment Removal	Small NEPA
Jock Fire BAER	No NEPA required
Seeley Fuels Reduction	WFHF
Cottonwood Creek Irrigation Diversion Removal	Small NEPA
Cedar Creek LWD Phase II	Small NEPA