



United States Department of Agriculture
Forest Service

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FY 2008 Legacy Roads and Trails Accomplishment Report

Pacific Northwest Region







*“Working Together
To Restore the Land”*

Cover Photo by Jack Sleeper, showing Cape Creek road decommissioning project, Siuslaw NE, Oregon. Photos show before, 1 year and 7 years after treatment.

Executive Summary

FY 2008 marked the first year for successful implementation of Legacy Roads and Trails (LRT). It is designed to reduce or eliminate road and trail risks to water quality and aquatic habitat, while reducing future maintenance requirements and increasing the safety and durability of the transportation system. Using the Region 6 Aquatic Restoration Strategy as a guide, \$8.4 million were targeted to accelerate implementation of high priority work in strategic locations of the Pacific Northwest Region (R-6). Approximately 50% of the funding was used for road decommissioning and fish passage, while 36% supported critical maintenance and storm damage repair work. The remaining funds were used to monitor the effectiveness of restoration projects and plan future ones. National Forests in Washington received 42% of the allocation to address needs on 33% of the Region's road and trail system. The remainder of the funds was directed towards critical work on National Forests in Oregon.

Most of the proposed work was successfully completed, despite numerous challenges. Accomplishments include:

-  23 road-stream crossings constructed/reconstructed for fish passage.*
-  934 miles of roads improved.*
-  132 miles of road decommissioned.*
-  219 miles of trails improved or maintained.*

LRT enabled the Region to make progress towards its goals of improving watershed conditions, creating a more durable and sustainable transportation network, and supporting local communities at a time of extraordinary economic challenges. Successful implementation was the result of teamwork, commitment and dedication by agency personnel and a wide range of partners and contractors. Investments in planning and regulatory streamlining have begun to provide projects for future implementation. Upgrading and decommissioning roads has long been a component of the Fish, Watershed and Engineering programs, since inadequately designed and maintained roads can substantially impact water quality and aquatic habitat. Despite these significant accomplishments, much work remains to be done to treat the Region's vast road system and address the considerable risks it poses to aquatic resources.

FY 2008 Legacy Roads & Trails Accomplishment Report

Background

The road network in the USFS, Pacific Northwest Region 6 (PNW) is vast, with a total length of 92,000 miles. This is more than the total length of streams on National Forests in Oregon and Washington. These roads provide multiple benefits, including access for recreational and resource management activities. However, forest roads can have substantial impacts on aquatic habitat and water quality, especially when they are not adequately designed or maintained.

Much of the Region's road system was built during the 1960's and 1970's to support intensive timber management across much of the land. Management shifts towards a more balanced, ecosystem-based approach during the mid-1990's reduced the need for such an extensive network. Since that time, major reductions in funding have limited annual maintenance to less than 15% of the system, just as many of its critical components are nearing or have exceeded their life-expectancy. Improvements are being accomplished on only 1% of the road system annually.



Tom Iraci

Inadequate funding for maintenance and recent large floods have combined to accelerate damage to both infrastructure and aquatic resources. Here, a failed stream crossing on an unneeded road delivers sediment to a stream on the Olympic National Forest, WA.

While there has been a consistent though modest program, to upgrade and decommission roads substantial risks to streams and aquatic habitat remain. These may be increasing due to the combined effects of inadequate maintenance and the prospect of larger and more frequent storms in the future. Large volumes of sediment can still be introduced into nearby streams, as highlighted by major storms in 1996-1997 and 2005-2007. Some roads prevent streams from accessing their floodplains. Additionally, more than 3,000 road-stream crossings have blocked or reduced upstream passage of salmon, trout and other aquatic organisms to an estimated 3,300 miles of habitat.



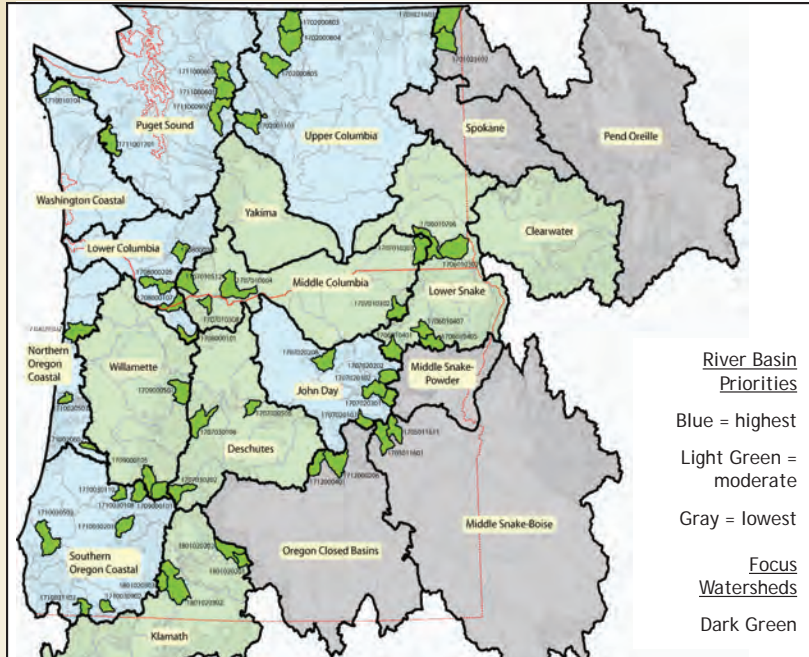
Tom Iraci

During storms, this riparian road on the Okanogan-Wenatchee National Forest, WA, delivers fine sediment into high-quality spawning habitat for steelhead and Chinook salmon. This road is being decommissioned through the Legacy Road and Trails program.



Tom Iraci

A fish passage barrier under State Highway 140 on Drew's Creek blocks access to spawning habitat for redband trout and other native fish on the Fremont-Winema National Forest, OR. Access to more than 10 miles of quality habitat was blocked by the crossing, prior to its removal.



In response to these and other restoration needs, the Region began implementing a sophisticated, Aquatic Restoration Strategy in 2003. The Strategy's primary emphasis is broad-scale protection and maintenance of healthy aquatic ecosystems. This is complemented by a strategically-focused, active restoration program to address sites that pose major resource risks. A system of multi-scale watershed prioritization is being used to focus restoration investments where they are likely to yield the greatest return (Figure 1). In addition, community involvement and a broad base of partnerships are greatly increasing the program's scope and effectiveness.

Figure 1. Priority river basins and focus watersheds in the PNW Region. Active restoration is focused in these high priority areas.



Tom Iraci

Improved coordination and cooperation between partners and agency resource and engineering staffs have enhanced program effectiveness. Here, planners review project design in the context of restoring a complete coastal estuary system (Salmon River, OR, Suislaw N.F.).

Major acceleration of road system restoration began in Fiscal Year (FY) 2008, when Congress authorized Legacy Roads and Trails and allocated the Forest Service \$40 million to begin its implementation. Funds are specifically intended to reduce risks and impacts to watershed health and aquatic ecosystems by removing fish passage barriers, decommissioning unneeded roads and addressing critical repair and deferred maintenance needs. Strong support for this effort was provided by the Washington Watershed Restoration Initiative, a coalition of State agencies and local organizations.

This report summarizes the work completed by the PNW Region with the \$8.4 million it received in the first year of funding.



Tom Iraci

Upgrading road-stream crossings improves fish passage and road system durability. At this site, a bridge replaced an undersized culvert, which had blocked upstream access for fish and other aquatic organisms. Zig Zag River, Mt. Hood National Forest.

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Decommissioning roads through a range of treatments can reduce runoff and erosion. Full slope recontouring was used on this project. Umatilla National Forest, OR.



Heavy road maintenance, including replacement of road cross-drain culverts, helps to increase road durability and reduce erosion and sediment delivery to nearby streams during storm events. At this site, culverts that have exceeded their design life are being replaced with new, larger diameter pipes. Gifford Pinchot National Forest, WA.

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Program Design

The Aquatic Restoration Strategy (ARS) provided a good foundation for delivering the work made possible by Legacy Roads and Trails funding. The PNW Region’s program was comprised of five principal components, each of which was directly tiered to ARS priority areas (Figure 2).

The program was designed to balance:

- project implementation and out-year planning;
- costly restoration treatments (e.g., decommissioning, fish passage) in relatively limited areas and less expensive maintenance work across broad areas;
- Regional and Forest priorities; and
- Forest capacity limitations.

Total Legacy Roads and Trails Funding: \$8.4 million

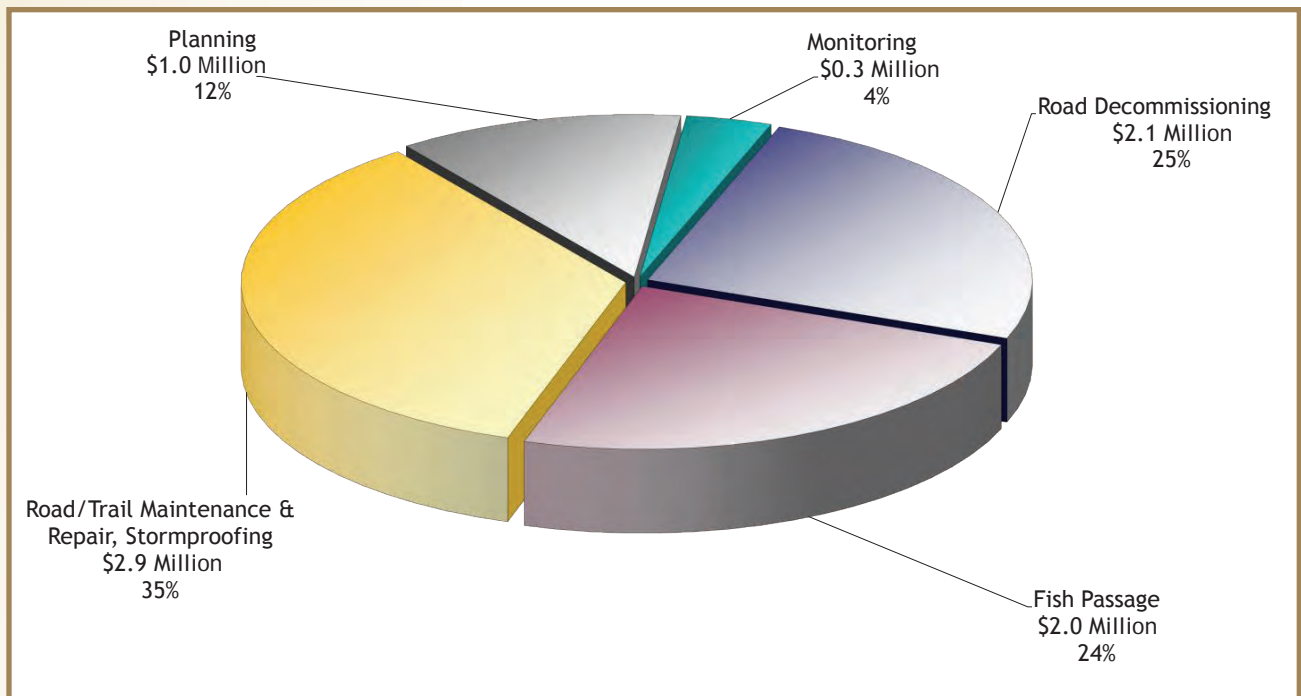


Figure 2. Legacy Roads and Trails Program components and their associated funding. Forty-two percent of program funds were directed to National Forests in Washington, which have one-third of the PNW Region’s roads. Fifty-eight percent of funding was allocated to Forests in Oregon.

Implementation

Implementation required substantial cooperation and coordination between agencies, partners, and contractors. In addition, strong leadership, hard work, and dedication from forest managers and staff were essential.



Dave Heller

“...As a valley resident, what makes this work so rewarding is that we are developing a sense of stewardship in the valley by fixing our roads and helping restore fish habitat...”

Ron Gold, R.G. Forestry Consultants



Tom Iraci

The following ‘*Spotlights*’ show examples of some of the important work that was accomplished this year.

***SPOTLIGHT:* Road decommissioning, Bull Run Watershed, Mt. Hood National Forest, OR**

The Bull Run River Watershed provides a pristine source of unfiltered drinking water for the Portland metro area (>1 million population). The Mt. Hood National Forest and City of Portland Water Bureau jointly manage the watershed. Legacy funding was used to decommission over 35 miles of old logging roads in 2008, reducing risks to water quality, aquatic habitat, and threatened and endangered aquatic species. This work completes a multi-year effort to restore this entire watershed. Decommissioning work by Leonard Collins, Colton, OR.



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A Bull Run stream crossing during and after road and culvert removal. Substantial volumes of road fill were removed from this site, which had a high risk of delivering sediment to the stream and reservoir downstream.



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Project Benefits:

- Restored hydrologic function.
- Reduced potential for sediment delivery.
- Re-establishment of riparian vegetation and function where roads paralleled or crossed streams.
- Improved watershed conditions, benefiting drinking water supply and aquatic habitat for Threatened and Endangered fish and other species.

SPOTLIGHT: Fish passage on Little Bridge Creek, Wenatchee National Forest, WA

Replacing an undersized, barrier culvert at the mouth of Little Bridge Creek with a longer and wider bottomless arch provided access to five miles of prime spawning and rearing habitat for Threatened and Endangered steelhead, bull trout, and Chinook salmon. This replacement also improved public safety, increased capacity to pass flood-borne debris, and reduced future maintenance needs. Legacy funding was heavily leveraged through other fund sources (\$646,000). Installation was completed by Cates and Erb Logging and Construction, Omak, WA.



Outlet jump height, excessive water velocity and shallow low flows in this culvert limited passage for juvenile fish and other species at this crossing.

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Simulating natural stream channel conditions through the pipe ensures passage for both aquatic and terrestrial species. Replacement of this culvert completes fish passage work in this watershed, where two upstream culverts and an irrigation diversion were previously upgraded.



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SPOTLIGHT: Road decommissioning, Skokomish watershed, Olympic National Forest, WA

FY 2008 Legacy Road projects were part of a larger, cooperative restoration effort in the Skokomish River Watershed. Projects included: removal of culverts, road decommissioning, stream channel restoration, construction of cross ditches and swales, pull-back of unstable fillslopes, road surface out-sloping, deep scarification, seeding and mulching. One road segment was converted to trail.

Watershed-wide accomplishments:

- 8.0 miles road decommissioning
- 1.3 miles decommissioning/conversion to trail
- 0.5 miles road closure (intensive)

Monitoring Results:

- 81 percent reduction in sediment delivery to streams.
- 100 percent reduction in culvert failure risk.
- 4000 cubic meters of earthen fill removed from high risk sites.



Tom Iraci

Road segment before and after decommissioning. Monitoring of this work on the Olympic National Forest documented significant reduction of watershed impacts. A major stream parallels this road, less than 100 feet downslope. Decommissioning work completed by Ron Gold, RG Forestry, Hoodport, WA.



Tom Iraci

SPOTLIGHT: Fish Passage on Butte Creek, Malheur National Forest, OR

An existing culvert was removed and replaced with a large bottomless arch. This project removed the lowest barrier on Butte Creek in the John Day River Basin, providing access to 5.2 miles of high quality spawning and rearing habitat for mid-Columbia steelhead, Chinook and bull trout. The new culvert was designed using streambed simulation techniques. Precast concrete footings were utilized to speed the construction process and minimize impacts. Installation completed by LD Perry, Inc., Joseph OR.



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Butte Creek, pre-project. This culvert was both a jump and velocity barrier for fish trying to move into the Butte Creek watershed.

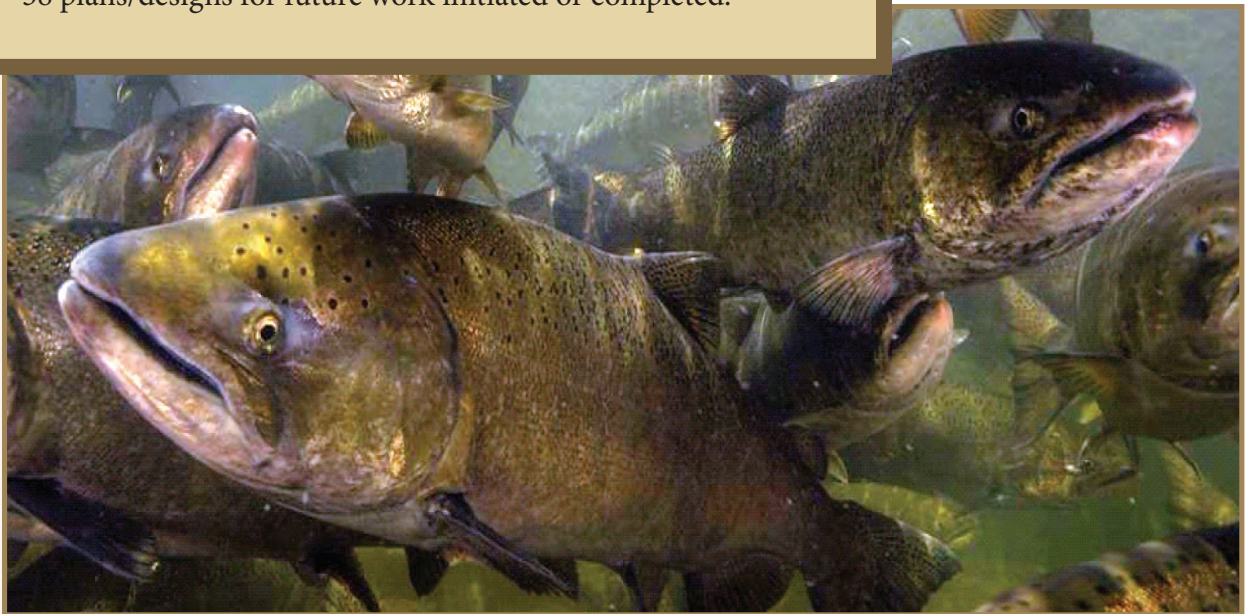


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Butte Creek, post-project. Designing culvert replacements to match or exceed bank-full stream channel width improves fish passage and helps ensure passage of flood-borne debris, reducing risk of plugging and road damage.

At a Glance: Accomplishments

- 23 road-stream crossings constructed/reconstructed for improved fish passage.
- 50 miles of passenger car roads improved, 23 miles maintained.
- 325 miles of high clearance roads improved, 536 miles maintained.
- 132 miles of road decommissioned.
- 6 bridges constructed/reconstructed.
- 90 miles of trails improved, 129 miles maintained to standard.
- 38 plans/designs for future work initiated or completed.



Mark Collin

Using the PNW Region's Aquatic Restoration Strategy, National Forests completed a substantial amount of high-priority work for restoring key ecological processes in some of the most important watersheds in Oregon and Washington. This has enabled the Region to make progress towards its goals to improve watershed conditions and aquatic habitat using whole watershed restoration.

Another goal is to provide a more durable, sustainable and affordable transportation system.

The Region made significant advances in FY08 by completing overdue maintenance and improvements and reducing long-term needs. Additional benefits include increased employment and economic activity in many local communities, particularly at a time of unprecedented economic challenge. More than \$6 million of Legacy Roads funds were contracted for road-related “jobs-in-the-woods” project work in predominantly rural areas.

At a Glance: Outcomes & Resource Benefits

- 65 miles of stream habitat restored or enhanced.
- 1,311 acres of watershed improved.
- Completed ‘a high priority watershed restoration’ work within the water supply boundary of the Bull Run River watershed, Mt. Hood National Forest.
- Reduced road system by 132 miles, thereby reducing maintenance needs by more than \$50,000/year.
- Made portions of the road network more durable, enabling it to better accommodate the more frequent large storms predicted for the future.



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Road work, coupled with other watershed and stream restoration can improve water quality and aquatic habitat for many species and water users.



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A new bridge on the Willamette National Forest, OR, is safer, more durable, and opens an additional 3.3 miles of habitat for Threatened spring Chinook and bull trout.

Monitoring and Evaluation

The Region is implementing two road restoration monitoring projects to: 1) clearly determine and articulate the effectiveness of restoration treatments; and, if needed 2) provide the basis for adjusting them. One project, being conducted with the Rocky Mountain Research Station, is designed to determine the degree to which decommissioning and maintenance treatments are effective in reducing impacts caused by changes in key watershed processes. Intensive field inventories and advanced, quantitative models are being used to develop and compare road risk/impact profiles before and after road treatments (Figure 3).



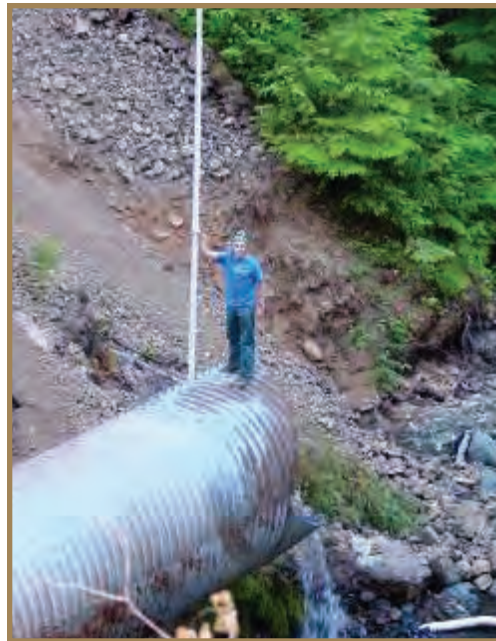
Figure 3. Estimates of fine sediment delivered to streams from road surface erosion prior to restoration treatments on the Olympic National Forest. Road segments with the highest sediment delivery rates are displayed in red and orange. Circles show locations and estimated amounts of sediment delivery. Comparable estimates were produced after road treatments to assess their effectiveness.



Field crew measuring stream channel conditions and biota at a recently built arch culvert.

The second project is focused on determining whether new stream crossings are simulating natural channel conditions and providing passage for fish and other aquatic biota. A range of physical habitat and fish population parameters are being measured above, below and within new crossings to determine how similar they are to unaltered stream channels.

Both projects are using consistent methods, which will allow inferences to be made at site and specific larger geographic scales.



Field crew measuring the volume of earthen fill at risk of delivery to streams before restoration treatments on the Olympic National Forest. Similar measurements were taken after treatments to quantify their benefits.

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A Look Ahead

The PNW Region has worked hard to prepare for the future demands and challenges of providing healthy watersheds, clean water and high quality aquatic habitat. A consistent strategy for aquatic restoration is in place to ensure effective and efficient use of available resources. There is strong coordination and a clear set of shared goals between the travel management and aquatic resource programs. A growing network of partners and stakeholders is providing increased support and ownership in the program. Investments in transportation system planning, project planning and design, and regulatory streamlining have begun to provide contract-ready projects for future implementation. Finally, monitoring of project effectiveness is providing information needed to improve the success of future projects.

There are, however, still major challenges to continued implementation and expansion of the current program. Inconsistent funding levels, competing priorities and limited availability of key skills constrain the development of a more comprehensive and proactive program. Efforts to address these issues continue.

Looking forward, the ultimate success of this important work will be measured by:

- the number of resilient watersheds providing high quality water and supporting healthy and diverse habitat for fish and other aquatic organisms;
- an increasingly durable and sustainable transportation network responsive to changing needs and conditions; and
- a growing number of local communities and partners engaged in and benefiting from this work and its ability to help restore the land.



Bruce McCammon





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