Mile BY Mile

Ten Years of
Legacy Roads
and Trails Success

ACKNOWLEDGEMENTS

THANKS TO Trout Unlimited, The Nature Conservancy, American Whitewater, American Rivers and the members of the Washington Watershed Restoration Initiative for their years of work in support of the Legacy Roads and Trails program. Additional thanks to U.S. Forest Service staff for providing data, project information and photos that were useful in preparing this report.

PREPARED BY Jacob Smith of Cedar Creek Strategies with design work by Tamra McIlvain of Fresh Bytes Design.

The Wilderness Society and WildEarth Guardians contributed to the development of the report.

COMMISSIONED BY The Wilderness Society.

PHOTO CREDITS: Alan Cressler, Angela Drexel/FEMA, Alison Dunlap, Elliotsville Plantation Inc, National Public Radio, Thomas O'Keefe, Mark Pearson, Daniel Schwen, University of California, USDA Forest Service, WildEarth Guardians, Torrey Wiley, Steve Zugschwerdt.

Coronado National Forest

EXECUTIVE SUMMARY

The U.S. Forest Service manages a truly massive road and trail system on behalf of the American public, including more than 370,000 miles of roads, 159,000 miles of trail, hundreds of thousands of culverts, and more than 13,000 bridges.

This road and trail system provides access for virtually every public use of these lands, a large proportion of which is in rural America. Recreational activities like hiking and hunting, and commercial activities like grazing and logging, all depend on this infrastructure.

It is an expensive system to sustain, and the Forest Service's road maintenance efforts have always been underfunded. The dramatic growth in fire fighting expenses in recent years has put even more pressure on the agency's limited infrastructure maintenance budget.

The implications are severe. When the agency is unable to maintain their road system, those roads and bridges deteriorate and fail, with enormous financial, environmental, and public access consequences. The Forest Service estimates that the current maintenance backlog on roads, trails, and bridges is nearly *four billion dollars.*

The growing frequency of intense storms – nearly 1,900 road sites on Forest Service lands in California were damaged just during the 2016-2017 winter season – exacerbates the problem.

The solution?
Maintain and stormproof the roads we need and retire the ones we don't. Accomplish this through a program that effectively leverages other resources, facilitates broad stakeholder collaboration, and strategically reduces the agency's expenses. And do all of this in a manner targeted at the highest priority work, that is transparent and accountable to taxpayers, and that simultaneously supports local economies by improving public access and creates good local jobs.

The Legacy Roads and Trails Remediation Program (LRT) was established by Congress in 2008 to tackle this challenge. It is a rare example of a federal program that sets out to do something specific and important, that is narrowly targeted and transparent enough to ensure appropriate Congressional and taxpayer accountability, that does this efficiently through leveraging and facilitating stakeholder collaboration, and that has an impressive track record of success. LRT delivers funds to address critical road issues in real time, enabling the Forest Service to efficiently design and implement projects appropriate for the specific area and local needs. And because funds primarily go to actual work on the ground, LRT creates high-wage jobs for contractors, including those who specialize in stream restoration, environmental design, and heavy equipment operation.

In short – it works.

Culvert and road blow-outs limit access to lands managed by the Forest Service.

TEN YEARS OF LRT: A SUCCESS STORY

Since the Legacy Roads and Trails program was initiated in 2008, it has accumulated an impressive track record of success.

18,057 Miles

of road maintained and/or stormproofed

1,030 Culverts

replaced to open up fish habitat

1,671 Miles

of stream habitat restored

7,053 Miles

of excess roads retired

(improving habitat, reducing pollution, and saving taxpayer dollars)

137 Bridges

constructed or reconstructed

5,020 Miles

of trail repaired

697–1,115 Jobs Created

or maintained each year

$3.5 Million

in reduced annual maintenance costs every year

THE CHALLENGE

A Massive Infrastructure System

The U.S. Forest Service manages one of the largest transportation infrastructure systems in the world. It consists of a truly massive and complex network of roads, culverts, and bridges: 370,752 miles of road,[1] hundreds of thousands of culverts, and more than 13,000 bridges.[2] The Forest Service estimates there are another 60,000 miles of unauthorized roads across the landscape.[3]

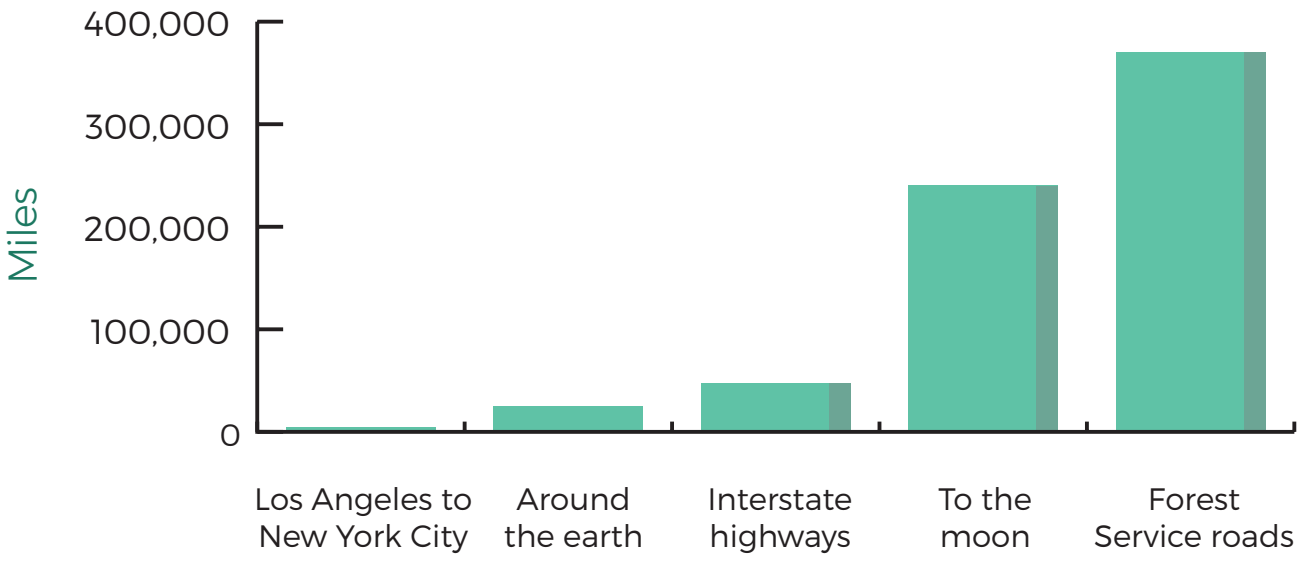
12,333 DAYS

FOR THE AVERAGE HIKER TO COVER THE U.S. FOREST SERVICE ROAD NETWORK[4]

7,963 DAYS

FOR THE AVERAGE HIKER TO COVER THE DISTANCE TO THE MOON

Comparing the Forest Service Road Network



THE CHALLENGE

Maintaining This Road System is Expensive

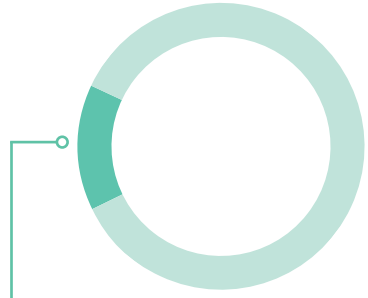
This vast road system is astonishingly expensive to maintain. In the Forest Service's Pacific Northwest Region, for instance, the cost ranges from $400/mile for a road only drivable for vehicles with high clearance to $8,000-$15,000/mile for a road drivable by passenger cars.[5]

Adding to the challenge: if they aren't regularly maintained, roads deteriorate more quickly as they age. Much like interest payments on a high-interest payday loan, once a road management agency falls behind on road system maintenance the increasing rate of deterioration makes it very difficult to catch up.[6] The continued dramatic growth in fire fighting expenses in recent years has drawn even more resources away from the Forest Service's limited infrastructure maintenance budget.[7]

Because agency funding has never kept up with maintenance needs, it is now facing a severe and very expensive road collapse problem. The Pacific Northwest Region estimated their annual road maintenance needs to be over $122 million for more than 90,000 roads in 2011. That same year they received only $20 million.[8] The Forest Service estimates that the current system-wide maintenance backlog is nearly four billion dollars.[9]

IS THE FOREST SERVICE KEEPING UP WITH MAINTENANCE NEEDS?

NOT EVEN CLOSE.



Only 14% of the road system was maintained in 2016.[11]

To its credit, the Forest Service is working to achieve a more manageable road system by retiring excess and unauthorized roads. But given continued budget pressure on the agency, road retirement of excess roads is declining even from its modest FY 2012 level of approximately one-quarter of a percent of the system road miles per year to less than one-third of this amount in FY 2016. At this current rate, the agency will not achieve its long-term road system goal of 260,000 – 300,000 miles for at least half a century.[12]

This is a Maintenance Level 2 road. ML 2 roads are generally limited to high-clearance 4WD vehicles because of rocks, mud, and other obstacles resulting from limited maintenance. ML 1 roads are closed to motorized uses.

This is a Maintenance Level 4 road. ML3 and ML4 roads are often gravel roads designed for regular passenger vehicles, while ML5 refers to ordinary paved roads.[10]

THE CHALLENGE

People Lose Access As Unmaintained Roads Collapse

Forest Service roads, providing vehicle access for logging, recreation, and nearly every other activity that occurs on Forest Service lands, are found in 42 states, covering huge swaths of largely rural America. Most of these roads were built 50-60 years ago and are not getting the maintenance they need. Once the agency falls behind on road maintenance the increasing rate of deterioration makes it very difficult to catch up.

For example, in Washington State, storm events in 2015 and 2016 eliminated access on one-third of the road miles in the Nooksack watershed – including many top recreation destinations where people snowmobile, hike, camp and climb.[13] It takes years before the roads can be fixed and access renewed.

Severe Storms Accelerate the Deterioration of Roads and Trails

Unmaintained roads are always at risk of deterioration and will eventually fail, but severe weather can accelerate and amplify these risks. Damage tied to storms is a substantial problem. For example, nearly 1,900 Forest Service road sites in California were damaged, rendering many roads impassable and costing tens of millions of dollars to repair, all during just a single winter season (2016-2017).[14] But effective actions to stormproof forest roads – enlarging and strengthening stream crossings, fortifying bridge abutments, improving water drainage – can reduce this kind of damage.[15]

Top: A road blow-out on the Mt. Baker-Snoqualmie National Forest. Bottom: Poor drainage and maintenance is resulting in erosion, habitat damage, and public access challenges on the Arapahoe National Forest.

GROWING COSTS: A CLOSER LOOK

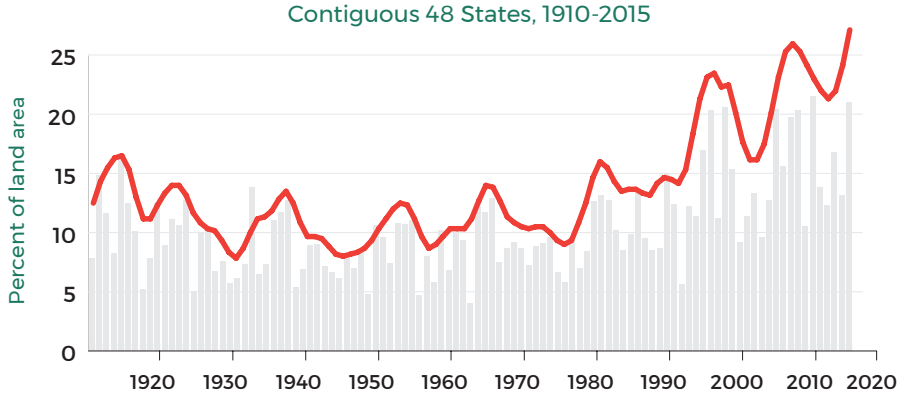
THE FOREST SERVICE IS GETTING HAMMERED BY A GROWING NUMBER OF STORMS EACH YEAR. THE AGENCY HAS SPENT NEARLY $180 MILLION OVER THE PAST TEN YEARS TO REPAIR DAMAGE FROM SEVERE STORMS. NEARLY 1,900 ROAD SITES ON FOREST SERVICE LANDS IN CALIFORNIA WERE DAMAGED JUST DURING THE 2016-2017 WINTER SEASON.[16]

The Growing Costs of Major Storms

The Forest Service, like every community, government agency, and business, is grappling with the growing impacts of extreme weather events. Major storms are already costing the Forest Service on the order of tens of millions of dollars every year, including nearly $29 million just in 2016.[17]

By retiring excess and unneeded roads and appropriately stormproofing the remaining needed roads, the Forest Service can cost-effectively reduce the damage that storms can cause and provide more consistent access. Ensuring reliable access is critical to local communities and the $9.5 billion outdoor recreation economy.[18]

Extreme One-Day Precipitation Events in the Contiguous 48 States, 1910-2015



The frequency of big storms has been growing since the 1940s. Nine of the worst ten years for extreme one-day precipitation events ever recorded have occurred since 1990.[19]

THE CHALLENGE

The Costs of a Failing Road System Pile Up

Forest roads are mostly dirt roads. When that dirt washes off, through rain runoff or when a road or culvert blows out, what was once a clear stream now is muddy with "elevated sediment." Erosion poses one of the biggest problems, sending elevated levels of sediment downstream.[20]

This drives up water treatment costs for downstream communities (many of which are in rural communities already struggling to maintain their aging water infrastructure), fills in reservoirs (reducing water storage capacity at a time when many communities across the U.S. are grappling with long-term drought), suffocates fish and shellfish, and harms both commercial and recreational fisheries.

Top: Poorly maintained or poorly designed roads can eventually collapse through wear and tear or because large storm events overwhelm the culverts and stream crossings, like this road on the Umpqua National Forest.

Bottom: Road washouts like this one on the Olympic National Forest destroy roads and culverts and place downstream habitat and water treatment facilities at risk.

HIDDEN COSTS: A CLOSER LOOK

Top: Inadequate road design or maintenance can lead to enormous erosion and the dumping of sediment into streams and rivers.

Bottom: A road blowout and landslide on the Olympic National Forest. The results include loss of public access, damage to fish habitat, and substantial water treatment facility costs to downstream communities.

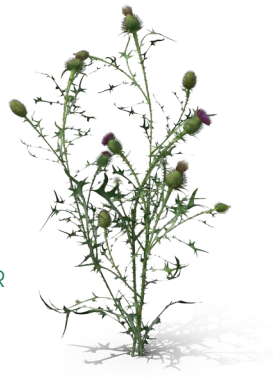
Deteriorating Roads Harm Downstream Communities

Roads are a major contributor to sediment pollution in streams and rivers, especially as they degrade and fail, harming both rural and urban communities.

The South Fork Tolt Watershed in Washington supplies one hundred million gallons of water per day to almost half of the residents of Seattle. After targeted road decommissioning and road improvements on the landscape, one-third of which is managed by the Forest Service, the sediment delivered to the drinking water reservoir was reduced by 85-90% (from 2,400 tons/year in 1993 to 240-330 tons/year in 2006), substantially reducing the cost of water treatment.[21]

Numerous studies have found the same thing: increased erosion from road blowouts or other damage forces downstream communities to deal with extra – often significant – water treatment facility costs. For instance, one study concluded that a 50% decrease in sediment levels in Oregon's Willamette Valley would save more than $200,000 in water costs for those communities.[22]

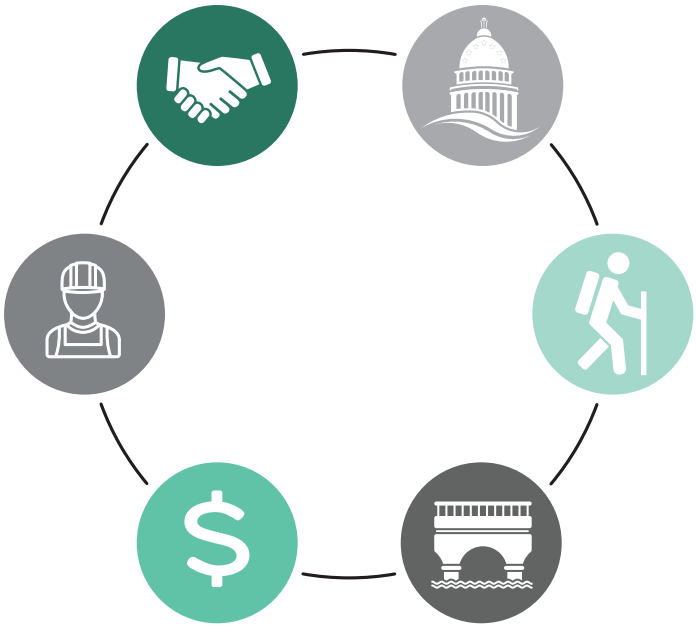
FOREST SERVICE ROADS THAT THE AGENCY DOESN'T NEED OR CAN'T AFFORD TO MAINTAIN ALSO SPREAD NOXIOUS WEEDS AND DEGRADE WILDLIFE HABITAT, WHICH CAUSES A HOST OF OTHER EXPENSIVE PROBLEMS. THE DEGRADED HABITAT ALSO DIMINISHES WILDLIFE VIEWING AND HUNTING OPPORTUNITIES, UNDERMINING LOCAL ECONOMIES DEPENDENT ON OUTDOOR RECREATION, WHICH IS ESPECIALLY HARMFUL IN RURAL COMMUNITIES.



THE SOLUTION

Legacy Roads and Trails is a Powerful, Effective Tool

1. FACILITATES LOCAL COLLABORATION
2. RESULTS-ORIENTED AND ACCOUNTABLE TO CONGRESS
3. PROTECTS PUBLIC ACCESS
4. REDUCES THE ECONOMIC AND ENVIRONMENTAL COSTS OF DETERIORATING ROADS AND BRIDGES
5. SAVES TAXPAYER DOLLARS
6. CREATES GOOD JOBS



THE SOLUTIONS ARE STRAIGHTFORWARD

More roads than the agency needs or can afford?
Retire some.

Storms taking out roads and disrupting public access?
Stormproof the important roads.

Polluted drinking water, added water treatment costs, and damage to fisheries?
Prevent erosion by repairing important roads and retiring the excess ones.

Diminishing Forest Service resources?
Leverage other dollars, facilitate broad stakeholder collaboration, and strategically reduce the agency's expenses.

Tight budgets?
Allocate resources to a program that is highly targeted, has an established track record, and is readily accountable.

Rural communities facing economic challenges?
Ensure that these dollars support local economies.

THE SOLUTION

The Legacy Roads and Trails Track Record: Ten Years of Success

The Legacy Roads and Trails Remediation Program, often called Legacy Roads and Trails or LRT, has enjoyed ten years of broad, bipartisan support because it solves these road and trail problems efficiently and transparently while providing a range of important benefits to local communities and public lands visitors and users.

By directing funds to the highest-value roads, the Forest Service is able to sustain access for recreation and other uses without the exorbitant costs associated with repairing deteriorated or collapsed roads. And by retiring the roads that aren't important, the agency is preventing their expensive deterioration and collapse, saving enormous sums while also preventing expensive environmental damage.

Most importantly, LRT has a long track record of demonstrated results. Since the program was established in 2008, LRT outcomes have included:

18,057 miles of important roads maintained and/or stormproofed to help them withstand powerful storms and ensure public access[23]

1,030 culverts replaced to restore fish passage and provide access to more than 1,000 miles of upstream habitat[24]

1,671 miles of stream habitat restored[25]

7,053 miles of unneeded roads safely retired, improving wildlife habitat for hunting and wildlife viewing and dramatically reducing sediment pollution in streams[26]

137 bridges constructed or reconstructed for safety[27]

5,020 miles of trails fixed to guarantee recreational access to public lands[28]

697-1,115 jobs created or maintained each year since the program began[29]

$3.5 million per year in reduced annual road maintenance costs[30]

10 years of success

jobs
access
habitat
savings

THE SOLUTION

10 Years of Success

Top: This culvert on the Willamette National Forest was insufficient to handle high flows during severe storms.

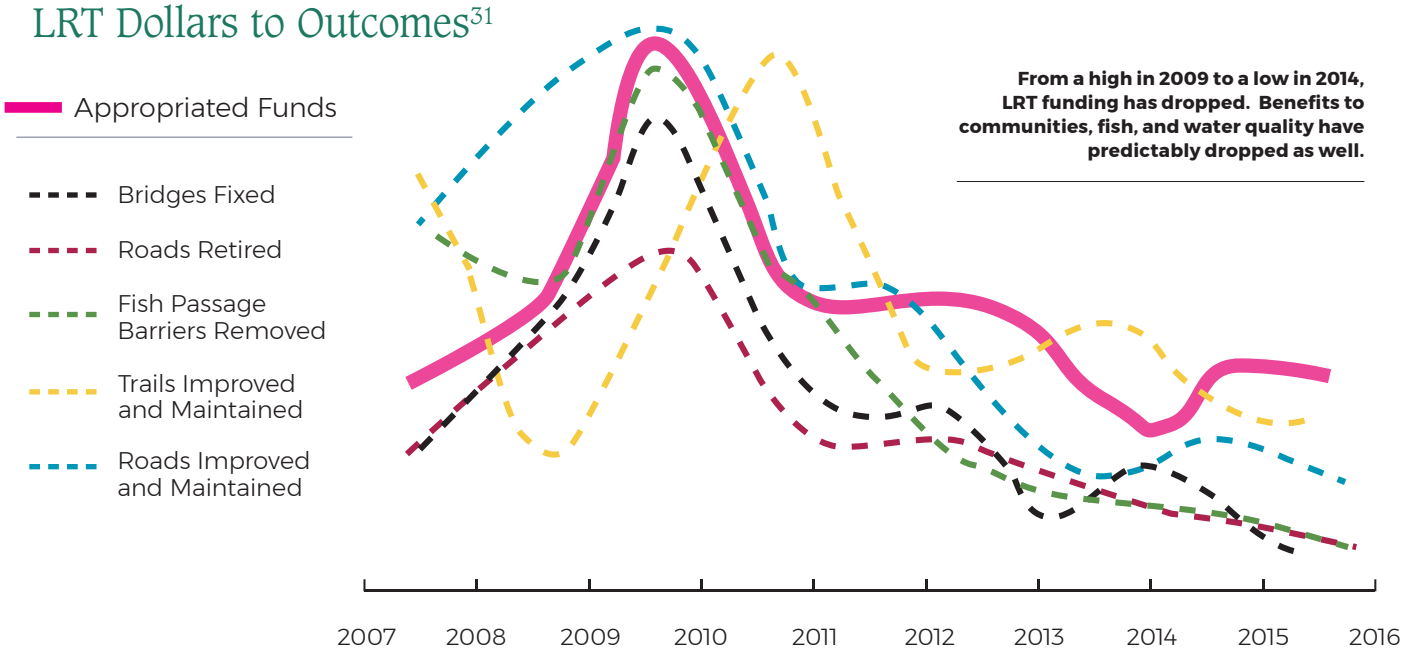
Bottom: Replacing the culvert with a hardened bridge allows a much greater volume of water to pass without damaging the bridge or the road.

Top: Even when bridges and roads are built appropriately, if unmaintained they deteriorate over time (and deteriorate more quickly as time passes).

Middle: LRT-funded projects typically support skilled labor at high wages.

Bottom: Retiring excess roads often improves wildlife habitat.

LRT Dollars to Outcomes[31]



From a high in 2009 to a low in 2014, LRT funding has dropped. Benefits to communities, fish, and water quality have predictably dropped as well.

JOB CREATION: A CLOSER LOOK

10 years of LRT

LRT creates or sustains 15-24 jobs annually for every million dollars spent.

That equals 697–1,115 jobs every year.[32]

Culvert to bridge construction, Gifford Pinchot National Forest.

"All restoration jobs are good jobs. I just wish they would do more."

said Kim Erion of the LKE Corporation after completing a project in the Gifford Pinchot National Forest, referring to the Forest Service's limited funding. The project generated nearly 350 hours of work for three contractors earning an hourly wage of between $27 - $45 dollars an hour.

THE SOLUTION

Broad and Bipartisan Stakeholder Support

LRT has long enjoyed bipartisan Congressional support and public support from a wide range of stakeholders, including local governments, fishing and hunting groups, hiking and wildlife enthusiasts, and environmental groups.[33] There aren't Republican potholes and Democratic potholes, as the adage goes, just potholes that need fixing. The same is true with roads managed by the Forest Service. The wide range of benefits, including improved access to Forest Service lands, reduced environmental and water quality damage, enhanced resilience to severe storms, the creation of good local jobs, and the ability to closely track how public dollars are being spent and what benefits we derive from that spending, are popular to Republicans, Democrats, and Independents alike.

Below: Participants in the Washington Watershed Restoration Initiative, the broad collaboration that gave birth to LRT in 2008, on the Mt. Baker-Snoqualmie National Forest.

> "Western Governors urge Congress and the Administration to fund and implement a sustainable roads program."
>
> Western Governors' Association
> Policy Resolution 08-3

LRT
Born out of a broad collaboration

In 2007 an unusual coalition of state agencies, recreation organizations, conservation groups, and tribes worked together to find a solution to a growing problem. The coalition – Washington Watershed Restoration Initiative - campaigned for a targeted fund to repair important roads and retire unneeded ones, earning broad support from a wide array of organizations across the country because of the urgency of the need and the practicality of the approach. Congress consequently established the Legacy Roads and Trails program the following year.

THE SOLUTION

LRT Leverages Millions in Additional Funding

The LRT program's capacity for leveraging is among its strengths. In many cases, the Forest Service can successfully leverage LRT funding with a variety of private, local, state, and other federal funding sources, substantially stretching the reach of every dollar allocated to LRT. For instance, between 2008-2015, the Forest Service's LRT program funds leveraged from external partners an additional $15 million for 1,049 aquatic habitat projects.[34]

The Forest Service used LRT funds to leverage an additional $15 million for 1,049 aquatic habitat projects from external partners.

Sources of leveraged funding are diverse. Some examples include:

- State transportation departments
- State game and fish agencies
- Wildlife organizations (e.g., Trout Unlimited, Rocky Mountain Elk Foundation)
- Watershed Restoration Grants (state/private)
- Clean Water Grants (federal/state)
- Secure Rural Schools (federal)
- Emergency Relief for Federally Owned Roads (federal funding in the transportation bill)
- Federal Stimulus (federal)
- Salmon Recovery Funds (federal/state)
- Bonneville Power Administration (federal)

Legacy Roads and Trails also strengthens other Forest Service efforts by providing funding to implement the roads portion of key agency initiatives, ensuring more efficient and better integrated projects. For instance, LRT is used to fund road- and trail-related watershed restoration projects in priority watersheds through the Watershed Condition Framework, and provides matching funds for projects under the Collaborative Forest Landscape Restoration Program.

LRT-funded construction projects typically involve local, high-skill labor for installing new culverts, laying concrete and steel for new or reconstructed bridges, recontouring, and other project elements.

LEVERAGED FUNDING: A CLOSER LOOK

Before (left) and after (right): The Mores Creek "culvert to bridge" project on Boise National Forest.

The Mores Creek Culvert Replacement Project

The Mores Creek Culvert Replacement Project on the Boise National Forest offers one example of LRT leveraging: LRT contributed $49,000 while the National Fish and Wildlife Foundation and Trout Unlimited contributed $45,030 and another $4,600 was provided by the U.S. Fish and Wildlife Service. The project involved replacing an undersized culvert with a larger and stronger pipe arch designed to withstand much more intense storms at the 100-year flood level. The benefits include reconnecting a critical stream that had blocked movement by bull trout and stormproofing a needed road to improve safety and reliability for forest users.[35]

"National Forests provide some of our best brook trout habitat and Trout Unlimted's partnership with the Forest Service is helping to strengthen brook trout populations across the East. Legacy Roads and Trails is an essential component of our partnership, providing funds that can be leveraged with other sources to reconnect hundreds of miles of trout streams."

- Keith Curley, Vice President for Eastern Conservation, Trout Unlimited

LRT IN ACTION

California

The eighteen National Forest units located in California together make up the Forest Service's Pacific Southwest Region, which is struggling with the challenges of a deteriorating road system and inadequate funding for maintenance. The increasingly intense weather afflicting the state is amplifying this already serious situation. As discussed earlier in the report, the 2016-2017 winter season damaged nearly 1,900 road sites, leaving many roads impassable.[37] As of October 2017, the agency has already hit $22 million in repair projects covering only 129 of those sites.[38]

Although the funding levels have never been adequate to the task, Legacy Roads and Trails has offered a particularly potent tool for repairing damaged roads, bridges, and trails as well as stormproofing all of this infrastructure to better protect it from future storms.

Between 2014-2016, the Forest Service's LRT budget in California totaled $14.9 million.[39] Those funds enabled the agency to maintain and improve 529 miles of Forest Service road and maintain and improve more than 177 miles of trail.[40]

Examples of the types of projects completed under LRT

A dramatically improved stream crossing on the Mendocino National Forest.

Trout Creek
Mendocino National Forest

Two undersized culverts at a Forest Service road stream crossing had rusted out and failed, blocking aquatic species from traveling upstream and downstream, threatening erosion and downstream water pollution, and putting the road at risk of collapse. LRT funds enabled the Forest Service to remove the rusted and failed culverts and replace them with casted reinforced concrete abutments and a much larger open-bottom arch. The result: a stream crossing capable of accommodating much greater flows and floods while protecting the road.[41]

California

This project repaired severe erosion problems and improved access and safety on the San Bernadino National Forest.

Crab Creek Bridge Construction
San Bernadino National Forest

A Forest Service road crossed a stream without a bridge, traveling directly through the stream bed. The results included significant erosion and downstream pollution, habitat damage, and public access challenges. The installation of a concrete bridge protected by a guardrail and native willow revegetation in the surrounding area resolved these problems.[42]

This Sequoia National Forest project made significant improvements to a nearly 11-mile stretch of deteriorated forest road.

Davis Road Rehabilitation
Sequoia National Forest

A 10.8 mile-stretch of Forest Service Road 12S01, also known as Davis Road, had deteriorated over time, including failed culverts, plugged drainage structures, deterioration of the road surface, and erosion concerns. This project included unplugging drainage structures, cleaning and reconditioning them, replacing the failed and undersized culverts, reconditioning the roadway and widening the shoulders in some places, and cattleguard installation.[43]

LRT IN ACTION

Idaho

Collapsing roads on the Clearwater National Forest.

A road blowout at the Fawn Creek culvert on the Boise National Forest.

LRT has funded a wide range of projects like these across Idaho, including bridge replacements, road reconstruction, road retirements, hardening road surfaces to prevent erosion, and trail repairs. Using Legacy Roads and Trails funding, the Boise National Forest is undertaking critical road work reducing long term maintenance costs, creating or retaining jobs, and improving water quality and habitat across the Forest.

The Forest Service administers 20 million acres in Idaho, including 32,600 miles of road and 22,000 miles of perennial streams.[44] The entire Intermountain Region, of which Idaho is a part, has grappled with a combination of aging road infrastructure and inadequate funding for years.

As a consequence, Idaho's National Forests are dealing with a wide range of challenges related to deteriorating roads, including impacts to migration and recovery of native fish like the bull trout and the Yellowstone cutthroat trout, drinking water impacts, and the loss of public access when roads and culverts blow out.[45]

Idaho

One of the Curtis Creek project culvert replacement sites before (left) and after (right) the work was completed.

The Curtis Creek Watershed

The Legacy Roads and Trails program has played a crucial role in providing funding to repair some of this damage and protect Forest Service roads and waterways from future damage. For instance, the Curtis Creek Watershed AOP Project replaced five inadequate culverts on the Boise National Forest. LRT funding of $149,200 leveraged an additional $359,110 from other sources. The work included removing the old culverts, installing concrete footings and structural plate steel pipe arches, seeding and erosion control, and incorporating other design measures to ensure that the new culverts can accommodate much larger flooding without damage to the road. As a result, habitat conditions for native fish like bull trout and steelhead trout have substantially improved, and public access and safety are now protected against storm-caused road blowouts at flooding that exceeds even 100-year flood levels.[46]

The Clearwater National Forest

Similarly, a project on the Clearwater National Forest, involving $212,000 from the Nez Perce Indian Tribe and the North Central Idaho RAC leveraged an LRT contribution of $50,000 to retire about 33 miles of unneeded roads causing significant resource damage. The project restored much of the original grade, armored the larger stream channels to improve protection against flooding, and restored native vegetation. A wide range of other partners were involved as well, including Idaho Transportation Department, Bonneville Power Administration, Idaho Office of Species Conservation, North Idaho RAC, Columbia River Intertribal Fish Commission, National Fish and Wildlife Foundation, National Forest Foundation, US Fish and Wildlife Service, and Trout Unlimited.[47]

LRT IN ACTION

Vermont

In August 2011, Hurricane Irene ripped up the eastern United States causing $16 billion in damage. By the time it reached Vermont, it had already weakened considerably and still – as a downgraded Tropical Storm - caused an estimated $733 million in damages in that small inland state alone. More than 500 miles of roadways and 200 bridges were damaged.[48]

Vermont's only National Forest, the Green Mountain, was hit hard. The Vermont Agency of Natural Resources reported that the storm damage resulted in closures on the forest of at least 20 trails, 5 recreation sites, and 20 roads.[49]

But prior to the storm, the Forest Service had begun upgrading culverts to make them more resilient to extreme events like Irene. In assessing the impacts of the storm, despite the extensive statewide damage, the Forest Service discovered that the culverts it had upgraded earlier using stormproofing techniques "suffered no damage and safely passed huge volumes of water, gravel and trees that clogged and destroyed other traditional culverts in the area."[50]

LRT continues to serve as an important funding source for projects in Vermont and elsewhere that improve fish habitat and reduce the risk of severe road and bridge damage from future storms.

Top: Floodwaters caused by Tropical Storm Irene washed out this bridge in Brattleboro, Vermont.

Bottom: A bridge in Rochester, Vermont destroyed by Tropical Storm Irene with a temporary pedestrian crossing installed.

Vermont

Mad Tom Brook

By installing a new, sturdier box culvert the Mad Tom Brook project opened up 1.1 miles of stream habitat and dramatically reduced the chances of a future road blowout.[51]

Michigan Brook Tributary

The Michigan Brook Tributary Project involved replacing an undersized culvert with a much wider and more resilient box culvert. As a result, 1.1 miles of stream habitat were opened up and the chances of a road blowout caused by flooding or other storm impacts were substantially reduced.[52]

Hayes Brook

The Hayes Brook project replaced a dramatically undersized culvert with a 50' bridge designed to accommodate a much greater volume of storm water, protecting the road and public access, the aquatic habitat, and downstream water quality. This project also opened up 1.3 miles of stream habitat.[53]

LRT IN ACTION

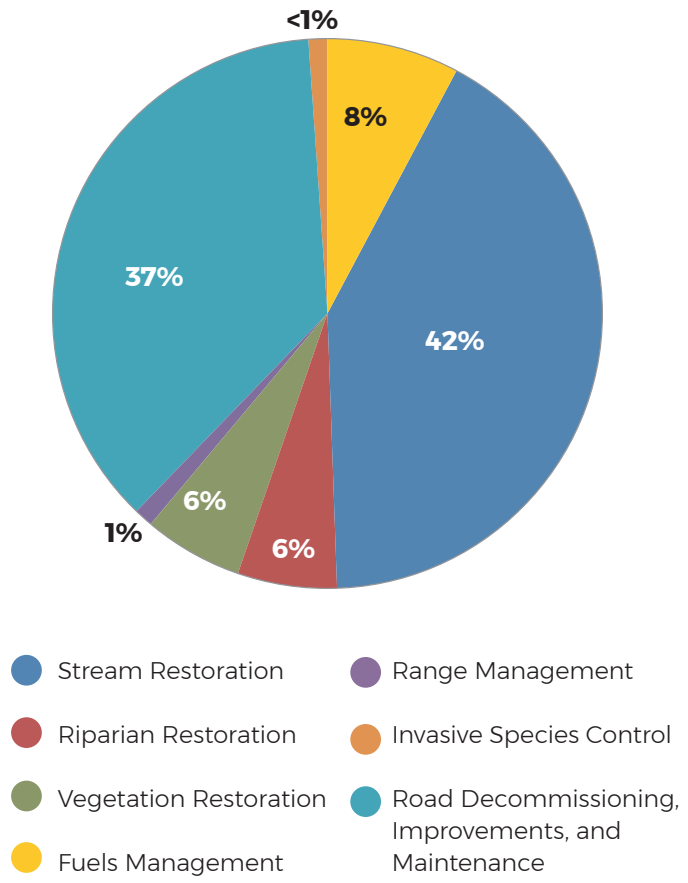
Washington/Oregon

In 2011, the Forest Service completed a health assessment of more than 15,000 watersheds across National Forest System lands. The assessment identified numerous watersheds in poor condition and in need of restoration. The agency selected 2-3 priority watersheds in each National Forest, created a plan of action for each, and then completed projects.[54]

In the Pacific Northwest region, the Forest Service identified 60 priority watersheds and created action plans for half of these. Projects in those plans included roadwork (37%), restoring stream and riparian areas (48%), controlling invasive species (8%), managing rangelands and fuels (7%), and restoring vegetation (6%). The estimated cost to improve this first group of watersheds was more than $72 million.[55]

This road on the Mt. Baker-Snoqualmie National Forest blew out when a culvert plugged during a storm, eliminating access to popular trails.

~ $72 Million to Complete Watershed Restoration in 31 Priority Subwatersheds



The Mt. Baker-Snoqualmie National Forest in Washington created an action plan for the Skykomish Watershed, where the greatest need was to improve water quality and habitat for Chinook salmon, bull trout, and steelhead. These fish are an important part of Northwest culture and heritage and had suffered heavily. Old, weather-damaged roads and broken culverts were the key culprits.[56]

This watershed is also a vitally important corridor for diverse recreational opportunities. Downhill skiers drive through to access Stevens Pass. Hikers and backpackers use roads to access trails into the Alpine Lakes wilderness and Pacific Crest Trail. Kayakers challenge themselves on the rapids of the Skykomish River. Anglers cast for steelhead in the blue waters. And the small, historic railroad town of Skykomish is emerging as a tourist destination.

Top: Retiring unneeded roads reduces liability and allows limited funds to go to important access roads (Mt. Baker-Snoqualmie National Forest).

Middle: Road treatments require skilled contractors who can maneuver heavy machinery, such as with this culvert removal on the Willamette National Forest.

Bottom: Partnerships, such as this one between the Willamette National Forest and Northwest Youth Corps, can be leveraged to secure additional funding and greater impact.

Washington/Oregon

The action plan identified the roads needed for recreational access as well as those no longer needed and posing a potential risk for salmon and steelhead. Legacy Roads and Trails funds were used over four years to close or retire unneeded roads, saving the Forest Service $190,000 annually on road maintenance. These saved dollars can be directed to the important recreational access roads. Additionally, the risk to aquatics was nearly eliminated across 14 miles of road. Studies show that effective road treatments can stop 70-80% of sediment from reaching streams. With this watershed improved, the Forest Service can move on to restore another priority watershed.[57]

In Oregon, National Forests are also working on their action plans. The Willamette National Forest recently wrapped up key projects in Staley Creek, a popular site for fishing, camping, hiking, and hunting. Here the problems affecting the health of the watershed included degraded camping sites, loss of meadow habitat, unstable roads, and poor stream and floodplain conditions.[58]

In partnership with the Middle Fork Willamette Watershed Council, the Forest Service leveraged federal funds (including Legacy Roads and Trails) with state funds to complete a Staley Creek improvement project. A total of 40 acres of the floodplain were enhanced and five acres of riparian areas near dispersed camping were fixed – benefitting cutthroat, rainbow and bull trout and spring Chinook salmon. Twenty-five of the 135 miles of roads were treated to stabilize them. And 23 acres of meadow were treated for invasive weeds so milkweed could grow for Monarch butterflies.[59]

In the Marion Watershed, on the Willamette National Forest, streams were experiencing impacts from a badly routed trail and poor drainage. Legacy Roads and Trails funds were used, in partnership with the Northwest Youth Corps, to fix problems on 24 miles of trail and reroute nearly two additional miles. A slew of waterbars, ditches, step-down drains, and berms were installed to infiltrate and move water naturally while also improving the hiking experience.[60]

TESTIMONIALS

New Mexicans understand that water is scarce and precious. It's important that we care for our rivers and streams so that, in return, we have access to clean water, pristine fisheries and excellent riparian habitat. New Mexico's rivers are in better shape because of the Forest Service's Legacy Roads and Trails Program."

- Andrew Black, Director of Community Relations, Education and Veterans Outreach, New Mexico Wildlife Federation

"Legacy Roads and Trails is a great program. In Mason County it made a big difference in reducing sediment loads running off old roads into the Skokomish river. The program is a blessing that rescued a degraded watershed."

Ron Gold - Mason County Public Utility Commissioner, WA

"As river recreationists we understand that forest roads provide access to the places we enjoy, but if not maintained properly crumbling roads degrade water quality and ultimately fail to provide access. The Legacy Roads and Trails program has proven its effectiveness in addressing water quality impacts of roads while ensuring essential access needs on public lands are met."

Thomas O'Keefe, Pacific NW Stewardship Director, American Whitewater

"The experiences sought by backcountry horsemen and women is dependent on well-maintained trails. The Legacy Roads and Trails Program is a vital program that funds urgent trail maintenance and repair to ensure safe and reliable access to our national forests."

- Freddy (Barbara) Dunn,Chairman, Back Country Horsemen of America

"The Nature Conservancy is proud of the record of accomplishment achieved by the Legacy Road and Trail Remediation effort that restores river and stream water quality by fixing or removing eroding roads, while providing construction jobs, supporting vital sportsmen opportunities, and reducing flooding risks from future extreme water flow events. We are partners in many important projects that help improve our forest streams and rivers, and we encourage continued support in the future to continue this important work."

- Christopher Topik, Director, Restoring America's Forests North America Region, The Nature Conservancy

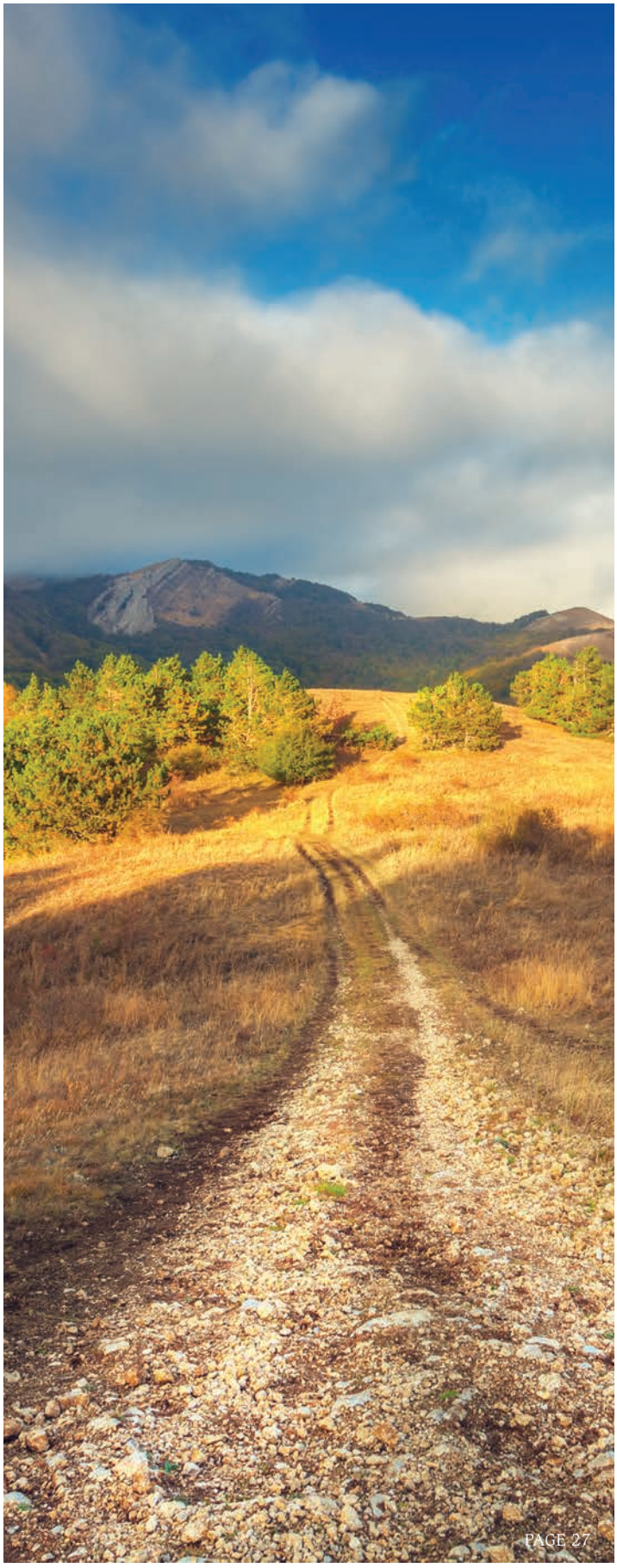
CONCLUSION

In a sense, the Forest Service's road system challenges boil down to a simple problem: too many roads that are falling apart and unaffordable within existing budgets. Many of these roads are no longer needed or even useful. And the impacts of this deteriorating road system are expansive, impeding public lands access, harming local economies dependent on this access, damaging habitat and other natural values, and forcing expensive water pollution problems onto downstream communities.

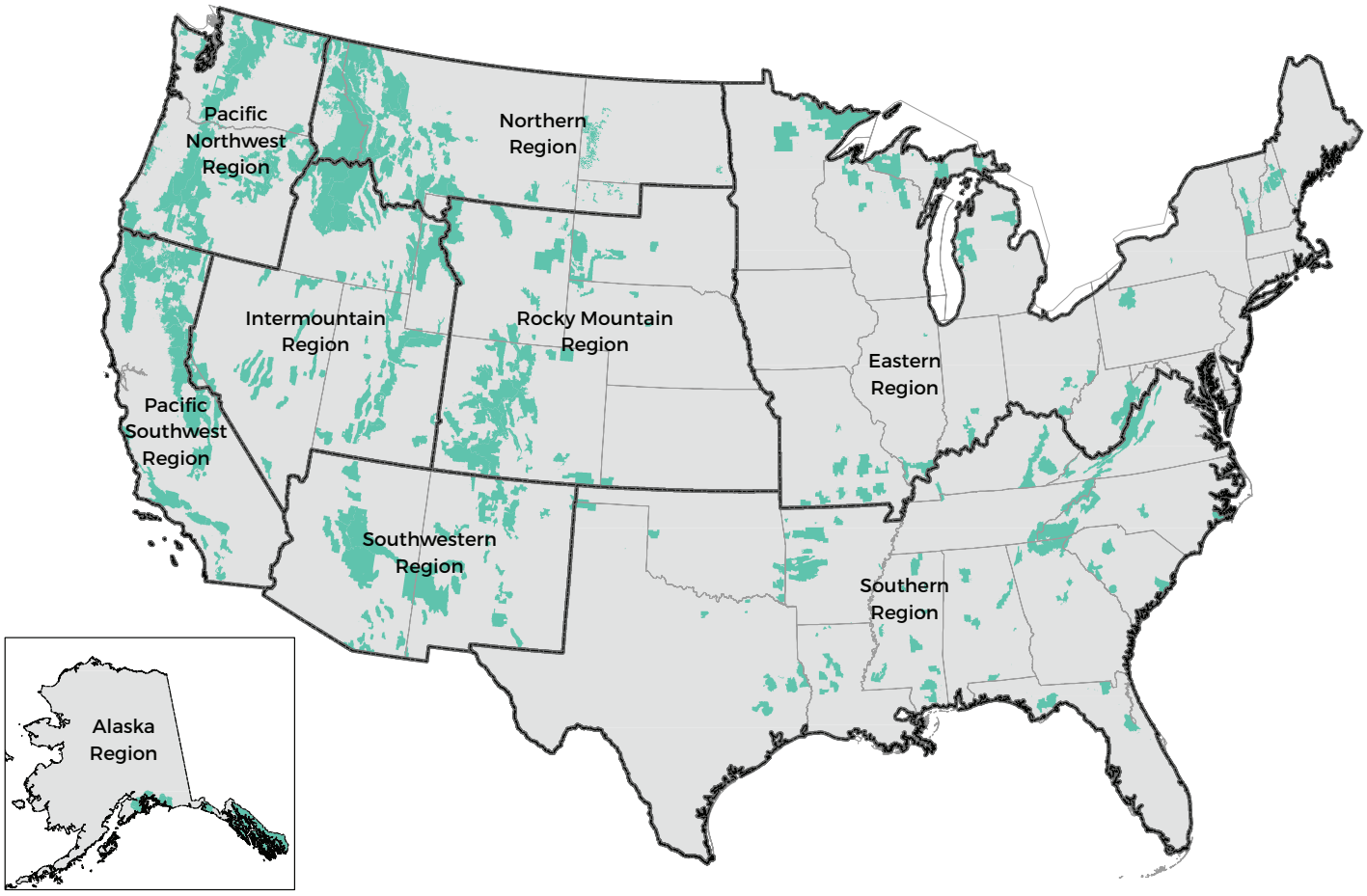
Rather than offering conceptual and speculative benefits at some hypothetical point in the future, LRT delivers high value in both the short-term and the long-term, and helps ensure that the dollars allocated for this critical need are actually spent tackling it.

In this era of political divisiveness and hyper-partisanship, LRT has managed to earn broad public support because it is targeted, accountable, and effective. While it is not a complete answer to all of the agency's road management challenges, LRT offers a powerful and efficient solution. By fixing and stormproofing the high-value road infrastructure and retiring excess roads, the Forest Service saves taxpayer dollars, improves public access to public lands, reduces environmental damage, creates good jobs, and supports local communities and their economies.

Continued Congressional appropriations supporting LRT would sustain a program with demonstrable high-value benefits, a program for which the agency is directly and easily accountable, a program targeted to a very specific problem with a very specific solution, and a program that has broad political support.



National Forests and Grasslands Administered by the U.S. Forest Service



154 National Forests and 20 National Grasslands

System Roads (miles)
Operated for passenger vehicles (Maintenance Levels 3-5): 64,944
Operated for high-clearance vehicles (Maintenance Level 2): 203,638
Stored for future use (Maintenance Level 1): 102,170
Total: 370,752

Bridges
Road Bridges: 6,195
Trail Bridges: 6,847
Total: 13,042

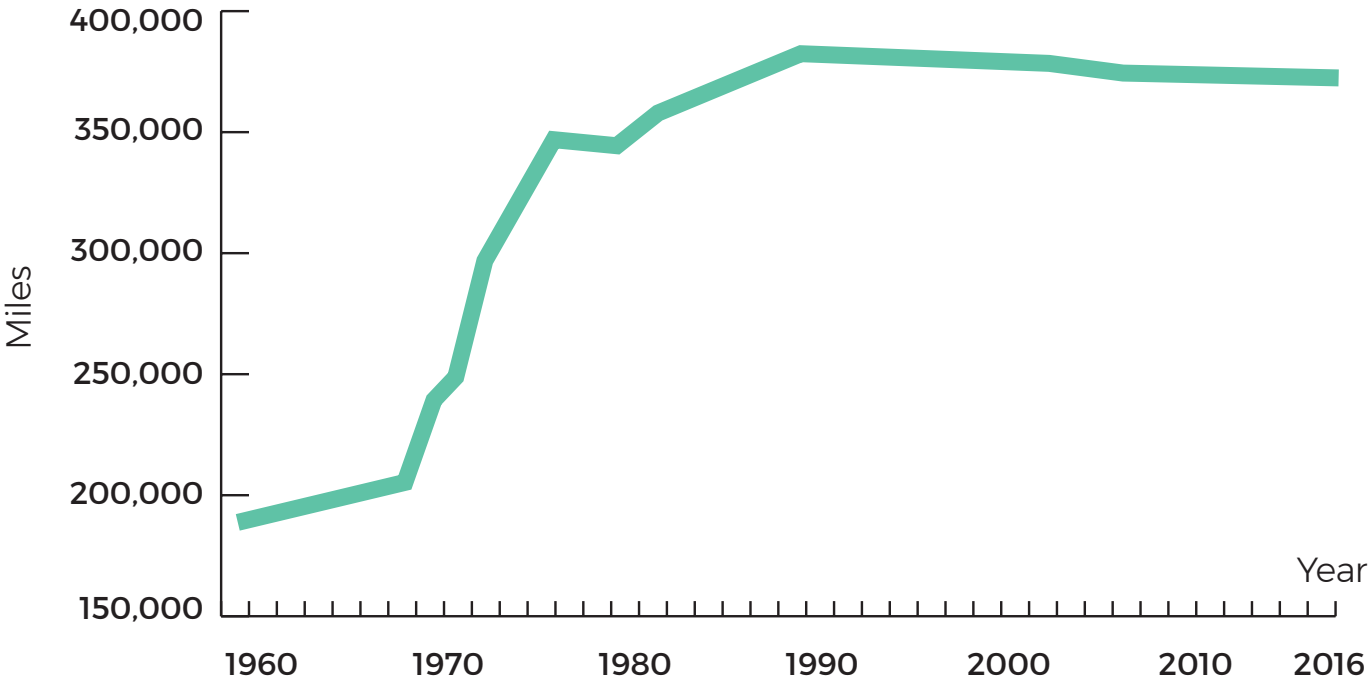
Trails (miles)
Motorized Trails: 60,282
Non-motorized Trails: 98,367
Total: 158,649

Other
Buildings: 39,756
Recreation Sites: 29,288

National Forest System Statistics as of 2016.[61]

Appendix B

Growth in the Size of the Forest Service Road System



Beginning in the 1960s (and possibly even earlier) the Forest Service's road system grew far beyond the agency's capacity to maintain and manage that road system.[62]

Appendix C

Forest Service Roads: Estimated Maintenance Costs

Pacific Northwest Region: Maintenance Costs

Maintenance Level	Annual Maintenance Cost per Mile	Number of Miles	Dollars Required for Proper Annual Maintenance
1	$227	30,635	$6,954,145
2	$431	49,991	$21,546,121
3	$8,126	7,244	$58,864,744
4	$15,562	1,507	$23,451,934
5	$13,166	750	$9,874,500
TOTAL		90,127	$120,691,444

The average cost to maintain a mile of Forest Service road varies greatly by National Forest and by Maintenance level. Roads maintained for high-clearance 4WD vehicles (ML2) are less expensive than those maintained for passenger vehicles (ML3-5). But even at the lower average/mile amounts, the costs add up quickly given the size of the Forest Service's road system.[63]

Appendix D

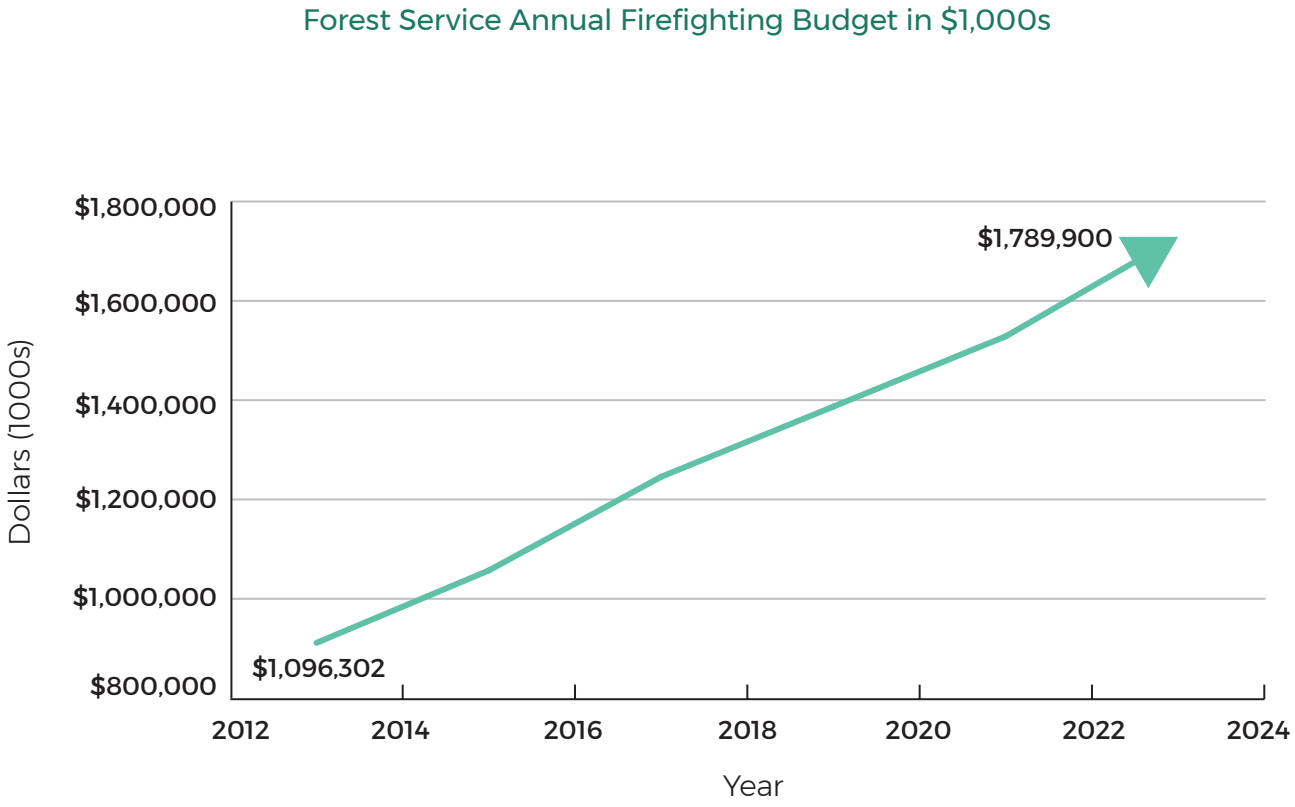
Miles of Road in Each Maintenance Level Category and in Each Forest Service Region (as of the end of 2016)

Region	Maintenance Level 1	Maintenance Level 2	Maintenance Level 3	Maintenance Level 4	Maintenance Level 5	TOTAL
Northern (Region 1)	16,955	20,178	11,197	1,335	371	50,036
Rocky Mountain (Region 2)	7,400	18,062	5,079	1,061	101	31,702
Southwestern (Region 3)	12,023	30,294	4,050	498	89	46,955
Intermountain (Region 4)	6,891	22,731	4,866	930	299	35,717
Pacific Southwest (Region 5)	6,333	31,749	5,735	1,732	687	46,237
Pacific Northwest (Region 6)	30,726	49,456	7,277	1,502	722	89,684
Southern (Region 8)	12,249	16,635	7,736	1,538	616	38,773
Eastern (Region 9)	8,130	12,866	3,585	2,921	369	27,870
Alaska (Region 10)	1,463	1,667	604	17	25	3,777
TOTAL	102,170	203,638	50,129	11,535	3,279	370,751

Maintenance Level 1 roads are closed to motorized use (but still exist on the ground).
Maintenance Level 2 roads are maintained for higher-clearance vehicles.
Maintenance Level 3-5 roads are maintained for passenger vehicles.[64]

Appendix E

Growth in Firefighting Budget



The cost of firefighting by the Forest Service has risen steadily for decades and is projected to continue its steep climb into the foreseeable future. In 1995, firefighting made up 16 percent of the Forest Service's annual appropriated budget. This year, for the first time, more than 50 percent of the Forest Service's annual budget will be dedicated to forest fires. This robs dollars from other Forest Service programs.[65]

Appendix F

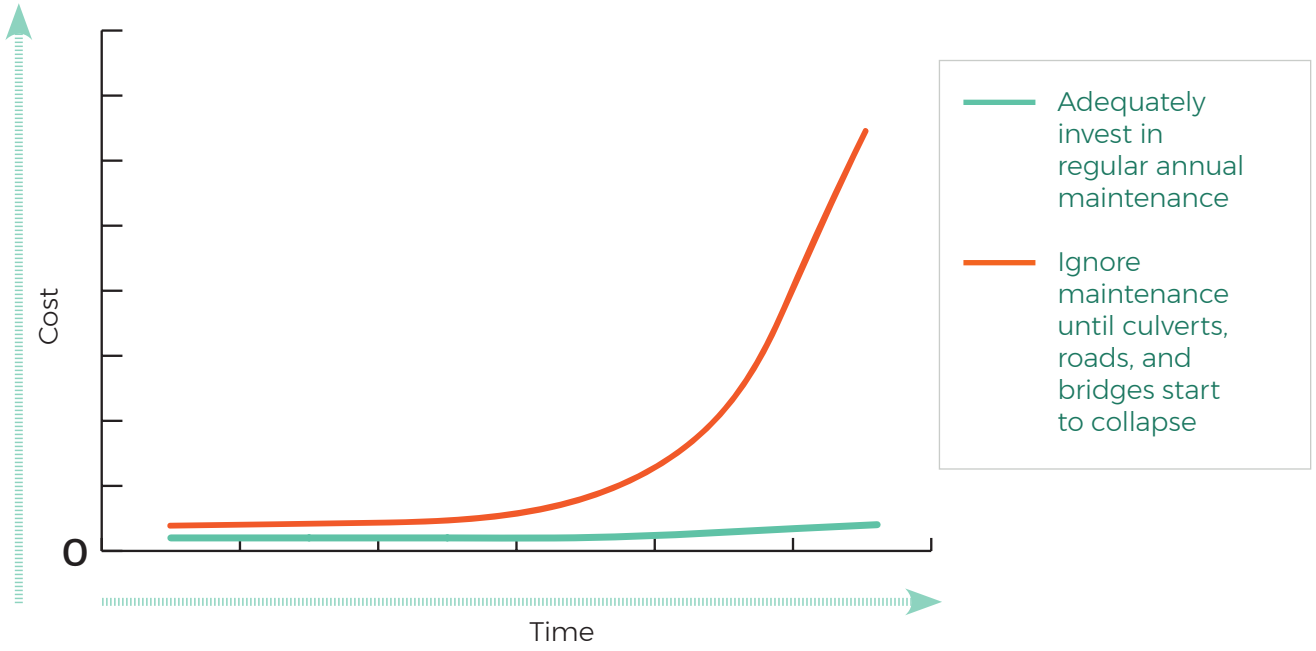
Legacy Road and Trail Outcomes

Appropriated Dollars To Outcomes[66]

FY	Funds Appropriated (millions of dollars)	Roads Retired (miles)	Roads Improved & Maintained (miles)	Trails Improved & Maintained (miles)	Fish Passage Restored	Bridges Fixed
2008	40	531	2,164	871	180	11
2009	50	929	2,887	190	163	32
2010	90	1,509	3,506	639	262	49
2011	45	581	1,670	1130	143	17
2012	45	461	1,607	385	69	14
2013	45	333	494	414	44	3
2014	35	223	517	462	27	10
2015	40	221	668	299	4	1
2016	40	122	501	320	16	0

Appendix G

The Cost of Regularly Maintaining Roads Compared to the Cost of Ignoring Them Until They Fail



By investing adequately in regular annual maintenance, the aggregate long-term cost to taxpayers is minimized. When regular annual maintenance is ignored or under-funded, the aggregate cost to taxpayers is dramatically higher.

Appendix H

Full List of Project Partners and Program Supporters

THE ORGANIZATIONS THAT HAVE PARTICIPATED IN THE LRT PROGRAM AS EITHER PROJECT PARTNERS OR PROGRAM SUPPORTERS INCLUDE LOCAL TOWN AND CITY GOVERNMENTS, TRIBES, STATE AND FEDERAL AGENCIES, HUNTING AND FISHING ORGANIZATIONS, CONSERVATION GROUPS, RECREATION GROUPS, WATER DISTRICTS AND OTHERS.[67]

REGION 1
Northern Region

Montana, North Dakota, Northern Idaho, portions of South Dakota

Project Partners

Bonneville Power Administration

Columbia River Intertribal Fish Commission

Federal Highway Administration

Idaho Office of Species Conservation

Idaho Transportation Department

Lincoln County Resource Advisory Council

Montana Fish, Wildlife, and Parks

National Fish and Wildlife Foundation

Nez Perce Tribe

North Idaho RAC

Trout Unlimited

University of Great Falls

U.S. Fish and Wildlife Service

Western Pacific Power Company

Program Supporters

American Rivers

American Whitewater

Avista Corporation

Back Country Horsemen of Montana

Centennial Valley Association

Clark Fork Coalition

Defenders of Wildlife

Great Burn Study Group

Greater Yellowstone Coalition

Ironworkers Local #14

Jefferson River Watershed Council

Lewis & Clark Chapter Montana Trout Unlimited

Missoula Area Central Labor Council AFL-CIO

Montana Association of Conservation Districts

Montana Audubon

Montanans for Quiet Recreation

Montana Laborers #1686

Montana Smart Growth Coalition

Montana Wilderness Association

Pacific Rivers

Rattlesnake Creek Watershed Group

Ruby Watershed Council/Ruby Valley Conservation District

Sierra Club

Swan Ecosystem Center

Swan View Coalition

The Wilderness Society

Watershed Consulting LLC

WildEarth Guardians

Western Environmental Law Center

Western Montana Building and Construction Trades Council

Yaak Valley Forest Council

Yellowstone Valley Audubon Society

REGION 2
Rocky Mountain Region

Colorado, South Dakota, Kansas, Nebraska, portions of Wyoming

Project Partners

Colorado Department of Fish and Wildlife

Coors Brewing Company

Federal Highway Grants

Friends of Mount Evans Volunteers

Gunnison Energy Company

Laramie Rivers Conservation District

Norbeck Society (SD)

Roaring Fork Outdoor Volunteers

Rocky Mountain Elk Foundation

South Dakota Game and Fish

Trout Unlimited

U.S. Environmental Protection Agency

U.S. Fish and Wildlife Service

Western Colorado Conservation Corps

Wildland Restoration Volunteers

Wyoming Conservation Corps

Wyoming Department of Environmental Quality

Wyoming Department of Fish and Wildlife

Youth Corp

Program Supporters

American Whitewater

Audubon Society - Fort Collins Chapter

Central Colorado Wilderness Coalition

Colorado Mountain Club

Colorado Watershed Assembly

Conservation Colorado

Front Range Colorado BLM Resource Advisory Council

Great Old Broads for Wilderness

High Country Citizens' Alliance

National Wildlife Federation

Quiet Use Coalition

Rocky Mountain Recreation Initiative

San Juan Citizens' Alliance

San Luis Valley Ecosystem Council

Full List of Project Partners and Program Supporters

Sheep Mountain Alliance

Sierra Club

The Wilderness Society

Trout Unlimited

Western Colorado Congress

Western Resource Advocates

WildEarth Guardians

Wilderness Workshop

REGION 3
Southwest Region

Arizona and New Mexico

Project Partners

American Conservation Experience

Amigos Bravos

Angostura Homeowner's Association

Arizona Department of Environment Quality

Arizona Department of Water Resources

Arizona State Parks

Arizona Trail Association

Backcountry Horsemen of America

Boy Scouts of America

City of Sedona (AZ)

Coconino Rural Environmental Corps (AZ)

Flagstaff Biking Organization (AZ)

Friends of Madera Canyon (AZ)

Friends of Sabino Canyon (AZ)

Friends of the Forest (AZ)

Grand Canyon Wildlands Council (AZ)

Green Valley Hiking Club (AZ)

Holloman Air Force Base (NM)

Mount Lemmon Water District (AZ)

Munds Park Trail Stewards (AZ)

New Mexico Environment Department

New Mexico Game and Fish

New Mexico School for the Blind & Visually Impaired (NM)

Quivera Coalition (NM)

Rocky Mountain Elk Foundation

Southern Arizona Hiking Club

Southern Arizona Rescue Association

Student Conservation Association

The Wellness Coalition (NM)

Town of Eager (AZ)

Town of Red River (NM)

WildEarth Guardians

Williams Production Company, LLC

XTO Energy, Inc.

Youth Conservation Corps

Program Supporters

Acoustic Ecology Institute (NM)

Albuquerque Wildlife Federation (NM)

Amigos Bravos (NM)

Archaeology Southwest

Arizona Wilderness Coalition

Arizona Zoological Society

Bird's Eye View

Center for Biological Diversity

Grand Canyon Wildlands Council

Great Old Broads for Wilderness

New Mexico Wilderness Alliance

NM Trout

New Mexico Wildlife Federation

Public Employees for Environmental Responsibility (AZ)

Sierra Club - Grand Canyon Chapter (AZ)

Sierra Club - Northern Group (NM)

Sierra Club - Southern Chapter (NM)

Sierra Club - Rio Grande Chapter (NM)

Sky Island Alliance (AZ)

Southwest Environmental Center

The Wilderness Society

Upper Gila Watershed Alliance (NM)

Western Environmental Law Center

White Mountain Conservation League (AZ)

WildEarth Guardians

Wildlife Habitat of New Mexico

REGION 4
Intermountain Region

Utah, Nevada, Southern Idaho, portions of Wyoming

Project Partners

National Fish and Wildlife Foundation

Nez Perce Tribe

Northwest Youth Corp

Southwest Idaho Resource Advisory Committee

State of Utah - Utah State Lands and Forestry

Trout Unlimited

U.S. Fish and Wildlife Service

Youth Conservation Corp

Program Supporters

Backcountry Horsemen - Idaho

Backcountry Hunters and Anglers - Idaho Chapter

Bear River Watershed Council

Framing our Communities

Grand Canyon Trust

Greater Yellowstone Coalition

Hells Canyon Preservation Council

Idaho Rivers United

Lands Council

Mark Agee Excavation

National Backcountry Hunters and Anglers

Nez Perce Tribe

Sierra Club - Idaho Chapter

The Wilderness Society

Trout Unlimited

Wild Utah Project

WildEarth Guardians

Winter Wildlands Alliance

Full List of Project Partners and Program Supporters

REGION 5
Pacific Southwest Region
California

Project Partners

Backcountry Horsemen of America

California Conservation Corps

California Conservation Crew

California State Department of Parks and Recreation

Friends of the Inyo

Karuk Tribe

Student Conservation Association

Trinity County Resource Conservation District

Tuolumne County Community Development Department

U.S. Army Corps of Engineers

Unites States Marine Corps

Watershed Research and Training Center

Program Supporters

California Wilderness Coalition

California Wilderness Project

Californians for Western Wilderness

Center for Biological Diversity

Center for Sierra Nevada Conservation

Central Sierra Environmental Resource Center

Defenders of Wildlife

Desert Protective Council

Environmental Protection Information Center

Forest Forever

Forest Issues Group

Friends of Hope Valley

Friends of the Inyo

Friends of the River

High Sierra Hikers Association

Klamath Forest Alliance

Klamath-Siskiyou Wildlands Center

Los Padres ForestWatch

Native Habitats

Northcoast Environmental Center

Public Employees for Environmental Responsibility

Sierra Club

Sierra Forest Legacy

Snowlands Network

The Wilderness Society

Trout Unlimited

Western Watersheds

WildEarth Guardians

Wilderness Guides Council

REGION 6
Pacific Northwest Region
Oregon and Washington

Project Partners

Applegate Partnership and Watershed Council (OR)

Association of Northwest Steelheaders

Bureau of Land Management

Bureau of Reclamation

City of Portland Water Bureau (OR)

Clackamas County (OR)

Confederated Tribes of the Warm Springs

Federal Highways Administration

Freshwater Trust

Grant Soil and Water Conservation District (OR)

Methow Salmon Recovery Foundation (WA)

Middle Fork Willamette Watershed Council (OR)

National Marine Fisheries Service

Native Fish Society

Okanogan County Conservation District (WA)

Oregon Department of Fish and Wildlife

Oregon Watershed Enhancement Board

Pacific Watershed Associates

Partnership of Umpqua Rivers (OR)

Rogue-Umpqua Resource Advisory Council (OR)

Sandy River Watershed Council (OR)

Skokomish Tribe

Skokomish Watershed Action Team (WA)

South Umpqua Rural Community Partnership (OR)

The Nature Conservancy

The Wilderness Society

U.S. Army Corps of Engineers

U.S. Environmental Protection Agency

U.S. Fish and Wildlife Service

Washington Department of Ecology

Washington Watershed Restoration Initiative (WWRI)

Washington Salmon Recovery Funding Board

Yakama Indian Nation

Program Supporters Oregon

American Rivers

American Rivers

Association of Northwest Steelheaders

Audubon Society of Portland

BARK

Cascadia Wildlands

Center for Biological Diversity

Central Oregon Land Watch

Clackamas County Board of Commissioners

Clackamas River Basin Council

Clackamas River Water Providers

Coast Range Association

Columbia Gorge Institute

Friends of the Kalmiopsis

Geos Institute

Hells Canyon Preservation Council

Klamath Forest Alliance

Klamath-Siskiyou Wildlands Center

Middle Fork Willamette Watershed Council

Native Fish Society

Northwest Environmental Advocates

Full List of Project Partners and Program Supporters

Northwest Environmental Defense Center

Northwest Sportfishing Industry Association

Oregon Department of Fish and Wildlife

Oregon Environmental Council

Oregon Kayak and Canoe Club

Oregon Trout

Oregon Wild

Pacific Coast Federation of Fishermen's Associations

Pacific Rivers

Portland State University

Sandy River Basin Watershed Council

Siskiyou Project

The Freshwater Trust

The Wilderness Society

Trout Unlimited - Oregon Council

Tualatin Riverkeeper

Waterwatch

Wild Fish Conservancy

WildEarth Guardians

Program Supporters Washington

Alpine Lakes Protection Society - WWRI

American Rivers – WWRI

American Whitewater – WWRI

Association of Northwest Steelheaders

Cascade Chapter, Sierra Club - WWRI

Cascade Forest Conservancy - WWRI

Conservation Northwest - WWRI

Earthjustice

Great Old Broads for Wilderness - Cascade Chapter

Lands Council

Mason County Conservation District

North Cascades Conservation Council - WWRI

Northwest Environmental Advocates

Olympic Coast Alliance

Olympic Forest Coalition - WWRI

Pacific Rivers - WWRI

Pilchuck Audubon Society - WWRI

The Mountaineers - WWRI

The Wilderness Society – WWRI

Trout Unlimited – WWRI

Upper Columbia United Tribes – WWRI

Washington Department of Ecology - WWRI

Washington Department of Fish and Wildlife - WWRI

Washington Department of Natural Resources -WWRI

Washington State Department of Ecology

Washington Trails Association - WWRI

Washington Wild - WWRI

Western Lands Project

Wild Fish Conservancy

WildEarth Guardians (WWRI)

REGION 8
Southeast Region

Tennessee, Florida, Arkansas, Kentucky, North Carolina, South Carolina, as well as other southern states

Project Partners

FourCorps Order of the Arrow

Arkansas Game & Fish Commission

Arkansas Wildlife Federation

Bog Research Inc., LA

Boy Scouts of America, Conroe, TX

Center for Aquatic Technology, VA

City of Fort Smith, Arkansas

Coweeta Hydrologic Lab

Eastern Brook Trout Joint Venture

National Wild Turkey Federation

Oklahoma Department of Wildlife Conservation

Progress Energy

Rocky Mountain Elk Foundation

Southeast Aquatic Resource Partners

Student Conservation Association, Houston, TX

Trout Unlimited

U.S. Environmental Protection Agency

Watershed Conservation Resource Center (AR)

Program Supporters

American Sportfishing Association (VA)

Ouachita Watch League (TN)

Wild Virginia (VA)

REGION 9
Northeast Region

Vermont, New Hampshire, West Virginia, Minnesota, Wisconsin, Pennsylvania, Missouri, Ohio, Indiana

Project Partners

Alger County Road Commission

AmeriCorps Crew

Camp Pasquaney, Student Conservation Association – New Hampshire Corps

Crawford County Highway Department

Ducks Unlimited

Itasca County Highway Department

Leech Lake Band of Ojibwe

Minnesota Conservation Corps

Minnesota Department of Natural Resources

New Hampshire Fish and Game

Ohio Division of Natural Resources

Oscoda County Road Commission

Ozark Trail Association

Student Conservation Association New Hampshire Conservation Crew/ Americorps

Town of Rochester

Trout Unlimited

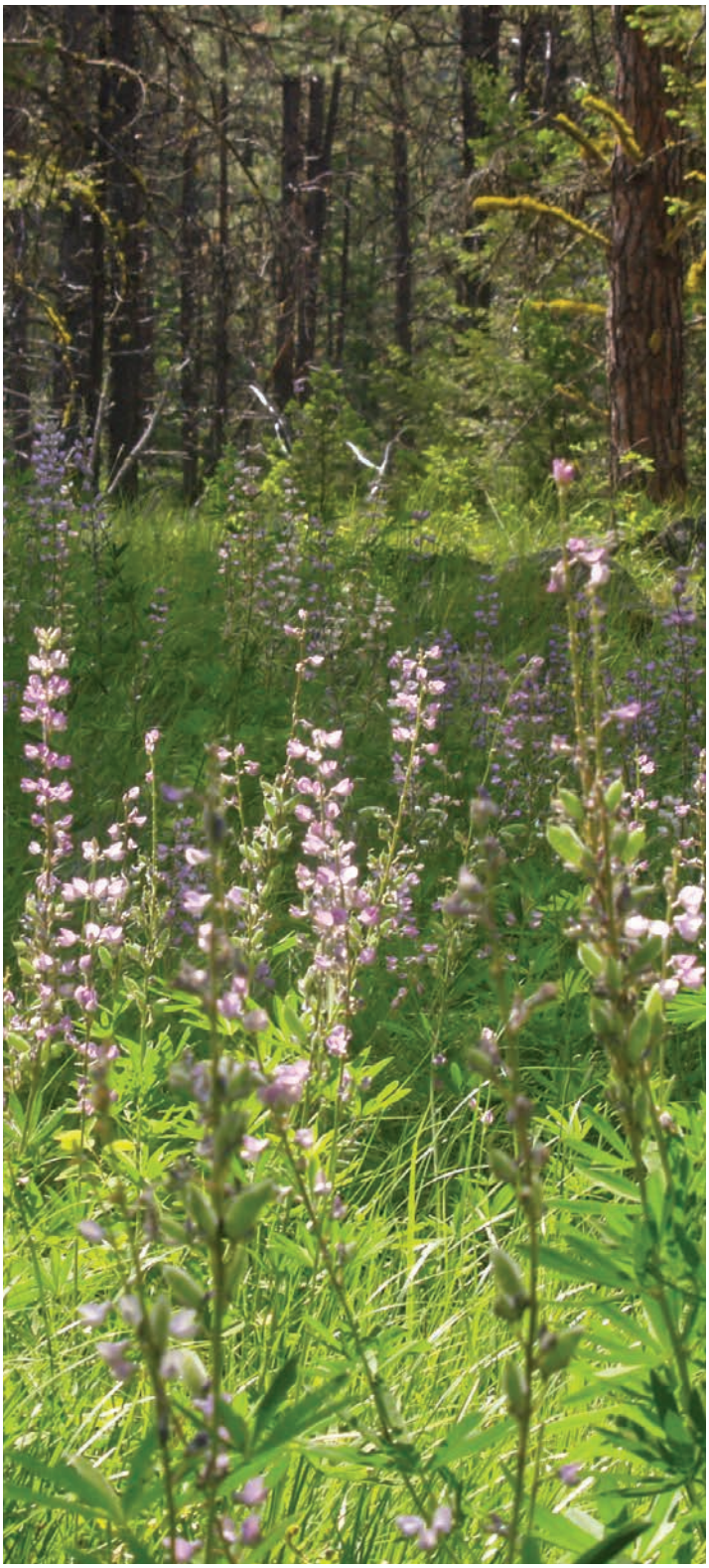
U.S. Army Corps of Engineers

Wexford County Road Commission

Wisconsin Department of Natural Resources

Wisconsin Department of Transportation

Full List of Project Partners and Program Supporters



Lolo National Forest

Program Supporters

Appalachian Mountain Club (MA)

Natural Resources Council of Maine

Friends of Blackwater (WV)

REGION 10

Alaska Region

Alaska

Project Partners

Alaska Department of Fish and Game

Alaska Fly Fishers

Kenai River Management Area

Kenai River Sport Fishing Association

Streamwatch

Trout Unlimited

Program Supporters

Access Fund

American Canoe Association

American Hiking Society

American Whitewater

American Rivers

Backcountry Horsemen of America - National

Backcountry Hunters and Anglers - National

Center for Biological Diversity

Defenders of Wildlife

EarthJustice

Endangered Species Coalition

Great Old Broads for Wilderness

International Mountain Biking Association

Izaak Walton League of America

Natural Resources Defense Council

Outdoor Alliance

Outdoor Industry Association

Pew Environment Group

Sierra Club

The Mountaineers

The National Center for Conservation Science and Policy

The Wilderness Society

Trout Unlimited

Western Environmental Law Center

Winter Wildlands Alliance

Backcountry Horsemen of America

Public Employees for Environmental Responsibility

Denotes groups that are also national program supporters.

These lists are incomplete due to limited data availability. We apologize to any partners not included here.

Footnotes

[1]USDA Forest Service. *National Forest Service System Statistics FY 2012 - FY 2016.* USDA Forest Service *and* USDA Forest Service. *National Forest System Statistics FY 2016.* FS 905(16) Brochure. March 2017. See Appendix A and Appendix B for more details.

[2]USDA Forest Service. *National Forest System Statistics FY 2016.* FS 905(16) Brochure. March 2017.

[3]USDA Forest Service, Washington Office. *National Forest System Road Management Strategy: Environmental Assessment and Civil Rights Impact Analysis.* USDA Forest Service. January 2001.

[4]Hiking 10 hours per day at a rate of 3 miles per hour.

[5]The Forest Service Pacific Northwest Region estimated that "Maintenance Level 1" roads (closed to motorized vehicles) cost an average of $277/mile, "Maintenance Level 2" roads (the roughest roads, designed for the toughest vehicles and the least amount of traffic) cost an average of $432/mile, and "Maintenance Level 5" roads average $13,666/mile. See Appendix C for details. USDA Forest Service, Pacific Northwest Regional Office. *Estimates of annual and deferred maintenance for USFS roads.* USDA Forest Service. June 2014.

[6]See Appendix G.

[7]See Appendix E.

[8]Data provided by USDA Forest Service, Pacific Northwest Regional Office. June 2014.

[9]The Forest Service reports that the maintenance backlog is $233 million for bridges, $3.2 billion for roads, $272 million for trails, and $9 million for trail bridges. USDA Forest Service. *National Forest System Statistics FY 2016.* USDA Forest Service. FS 905(16) Brochure. March 2017.

[10]See Appendix D.

[11]The Forest Service maintained 50,388 miles of passenger and high clearance roads in 2015 and 51,374 miles in 2014, which constitutes approximately 14% of the roughly 371,000-mile road system. USDA Forest Service. *Forest Service 2017 Budget Justification.* USDA Forest Service. February 2016. Page 244.

[12]In the Forest Service's 2001 Road Management Strategy Environmental Assessment, the agency projects that the road system will stabilize at 260,000 - 300,000 miles after it completes its intended road retirements. Given the agency's current road system of approximately 370,000 miles, this would require retiring 70,000 – 110,000 miles. At a rate of 122 miles/year (the FY16 level), this would take 573 – 901 years. USDA Forest Service, Washington Office. *National Forest System Road Management Strategy: Environmental Assessment and Civil Rights Impact Analysis.* USDA Forest Service. January 2001 *and* USDA Forest Service. *National Forest Service System Statistics FY 2012 - FY 2016.* USDA Forest Service.

[13]USDA Forest Service, Mt. Baker-Snoqualmie National Forest. *North Fork Nooksack Access and Travel Management Project Environmental Assessment.* USDA Forest Service. February 2016.

[14]USDA Forest Service, Pacific Southwest Region. *2016-2017 Winter Storm Damage Summary As of June 2017.* USDA Forest Service and Personal Communication between Josh Hicks and Leslie J. Boak, Acting Deputy Director of Engineering, Pacific Southwest Region, Forest Service. As of October 2017 the repairs costs are reported to be approximately $22 million for just the 129 worst sites.

Footnotes

[15]Napa County Resource Conservation District. *NCRCD-Characteristics-of-Storm-Proofed-Roads.* Napa County Resource Conservation District. December 2014.

[16]USDA Forest Service Pacific Southwest Region. *2016-2017 Winter Storm Damage Summary As of June 2017.* USDA Forest Service.

[17]USDA Forest Service, Washington Office. *Emergency Relief for Federally Owned Roads - Amounts. 2008-2017.* USDA Forest Service. July 2017.

[18]USDA Forest Service. *Forest Service 2017 Budget Justification.* USDA Forest Service. February 2016. Page 22.

[19]National Oceanic and Atmospheric Administration. *U.S. Climate Extremes Index*. Accessed January 2016 by Environmental Protection Agency.

[20]The amount can vary depending on the road, soil, and ecosystem type. One Forest Service study found that every square foot of road surface could produce on average 75 pounds of sediment per year. Sarah Farmer. *Mountain Roads and Erosion: Predicting Erosion and Storm Runoff on High-Elevation Roads.* July 6, 2017. USDA Southern Research Station.

[21]Seattle Public Utilities. *South Fork Tolt Watershed Management Plan.* June 2011. Prepared by Tetra Tech.

[22]W. B. Moore and B. A. McCarl. *Off-site costs of soil erosion: a case study in the Willamette Valley.* Western Journal of Agricultural Economics 12:42-49. 1987.

[23]USDA Forest Service, Washington Office. *CMLG Accomplishments. 2008-2017.* USDA Forest Service. July 2017.

[24]USDA Forest Service, Washington Office. *CMLG Accomplishments. 2008-2017.* USDA Forest Service. July 2017.

[25]USDA Forest Service, Washington Office. *1,000th Culvert Celebration.* USDA Forest Service. February 2016.

[26]USDA Forest Service, Washington Office. *CMLG Accomplishments. 2008-2017.* USDA Forest Service. July 2017.

[27]USDA Forest Service, Washington Office. *CMLG Accomplishments. 2008-2017.* USDA Forest Service. July 2017.

[28]USDA Forest Service, Washington Office. *CMLG Accomplishments. 2008-2017.* USDA Forest Service. July 2017.

[29]Economists have estimated that every $1 million spent on these activities creates and/or maintains 15-24 direct and indirect jobs annually. LRT has received $464.7 million between 2008-2017, totaling 697-1,115 jobs created or maintained each year on average. Max Nielsen-Pincus and Cassandra Moseley. *Economic and Employment Impacts of Forest and Watershed Restoration in Oregon.* Ecosystem Workforce Program. Working Paper Number 24. Spring 2010.

[30]USDA Forest Service data.

[31]USDA Forest Service, Washington Office. *CMLG Accomplishments. 2008-2017.* USDA Forest Service. July 2017. See Appendix F for more details.

[32]LRT has received $464.7 million between 2008-2017, totaling 697-1,115 jobs created or maintained each year on average. This job creation multiplier was modeled on restoration efforts in Oregon and extrapolated to the nation. Max Nielsen-Pincus and Cassandra Moseley. *Economic and Employment Impacts of Forest and Watershed Restoration in Oregon.* Ecosystem Workforce Program. Working Paper Number 24. Spring 2010.

[33]See Appendix H for full list of project partners and program supporters.

[34]USDA Forest Service, Washington Office, Aquatics Program. *1,000 Culvert Celebration.* USDA Forest Service. Spring 2016.

[35]Data provided by the USDA Forest Service, Intermountain Regional Office.

[36]USDA Forest Service. *Integrated Resource Restoration Report 2015 Report.* USDA Forest Service. Undated. A number of reports have noted that the IRR program makes it more difficult to track outcomes, with implications for accountability and transparency. E.g., Courtney Schultz, Katherine Mattor, and Cassandra Moseley. *Evaluating the Integrated Resource Restoration Line Item: Results From Phase 1.* University of Oregon, Ecosystem Workforce Program, and Colorado State University. Spring 2014 *and* Courtney Schultz, Katherine Mattor, and Cassandra Moseley. *Evaluating the Integrated Resource Restoration Line Item: Results From Phase 1.* University of Oregon, Ecosystem Workforce Program, and Colorado State University. Winter 2015 *and* Courtney Schultz, Kathleen McIntyre, Autumn Ellison, and Cassandra Moseley. *A Third-Party Evaluation of the IRR Pilot: Report From Phase 3: Stakeholder Outreach and Engagement*. University of Oregon, Ecosystem Workforce Program, and Colorado State University. Winter 2015.

[37]USDA Forest Service, Pacific Southwest Region. *2016-2017 Winter Storm Damage Summary As of June 2017.* USDA Forest Service.

[38]Personal communication between Josh Hicks and Leslie J. Boak, Acting Deputy Director of Engineering, October 24, 2017.

[39]USDA Forest Service, Washington Office. *CMLG and NFRR Allocations by Region.* 2013-2016. USDA Forest Service. July 2017.

[40]USDA Forest Service, Washington Office. *CMLG Accomplishments. 2008-2017.* USDA Forest Service. USDA Forest Service. July 2017.

[41]Data provided by USDA Forest Service, Pacific Southwest Regional Office. CMLG Projects.

[42]Data provided by USDA Forest Service, Pacific Southwest Regional Office. CMLG Projects.

Footnotes

[43]Data provided by USDA Forest Service, Pacific Southwest Regional Office. CMLG Projects.

[44]USDA Forest Service, Northern and Intermountain Regions. *Staff Report, Legacy Roads and Trails Remediation Initiative Accomplishments in the State of Idaho 2008 to 2010.* USDA Forest Service. January 11, 2011.

[45]USDA Forest Service, Northern and Intermountain Regions. *Staff Report, Legacy Roads and Trails Remediation Initiative Accomplishments in the State of Idaho 2008 to 2010.* USDA Forest Service. January 11, 2011.

[46]USDA Forest Service. *2010 Legacy Roads and Trails (CMLG) Project Summary: Curtis Cr. Watershed AOP Project.* USDA Forest Service. Undated.

[47]USDA Forest Service. *2008 Legacy Road Project – Road Decommissioning: Lochsa/Lolo Road Decommissioning.* USDA Forest Service. Undated.

[48]Sarah Pealer. *Lessons From Irene: Building Resiliency As We Rebuild.* Vermont Agency of Natural Resources. January 4, 2012 *and* Insurance Journal. V*ermont's Irene Recovery Bill at $733M, Still More Work to Do.* Insurance Journal. June 17, 2002.

[49]USDA Forest Service, Green Mountain National Forest. *GMNF is Now Open to Vermonters and Visitors: National Forest Open Unless Areas Are Posted Closed.* USDA Forest Service News Release. September 16, 2011.

[50]Gillespie, Nat. USDA Forest Service. *Forest Service Stream Technology Can Prevent Road and Bridge Washouts.* USDA Forest Service. April 12, 2012.

[51]Personal Communication between Marlies Wierenga and Daniel McKinley, Green Mountain & Finger Lakes National Forest, USDA Forest Service.

[52]Personal Communication between Marlies Wierenga and Daniel McKinley, Green Mountain & Finger Lakes National Forest, USDA Forest Service.

[53]Personal Communication between Marlies Wierenga and Daniel McKinley, Green Mountain & Finger Lakes National Forest, USDA Forest Service.

[54]USDA Forest Service, Pacific Northwest Regional Office. Personal Communication 2012.

[55]USDA Forest Service, Pacific Northwest Regional Office. Personal Communication 2012.

[56]USDA Forest Service, Mt. Baker-Snoqualmie National Forest. *South Fork Skykomish Roads Environmental Assessment.* USDA Forest Service. March 2012.

[57]USDA Forest Service Mt. Baker-Snoqualmie National Forest. Personal Communication 2017.

[58]USDA Forest Service, Willamette National Forest. *Staley Creek WRAP Accomplishment - 2017.* USDA Forest Service. Undated.

Footnotes

[59]USDA Forest Service, Willamette National Forest. *Staley Creek WRAP Accomplishment - 2017.* USDA Forest Service. Undated.

[60]USDA Forest Service, Willamette National Forest. *2014 Legacy Roads and Trails (CMLG) Project Summary - Marion Watershed Drainage.* USDA Forest Service.

[61]USDA Forest Service. *National Forest System Statistics FY 2016.* USDA Forest Service. FS 905(16) Brochure. March 2017.

[62]Adapted from Gerald Coghlan and Richard Sowa. *National Forest Road System and Use Draft Report.* USDA Forest Service. 1998.

[63]USDA Forest Service, Pacific Northwest Regional Office. *Estimates of annual and deferred maintenance for USFS roads.* June 2014.

[64]USDA Forest Service, Washington Office. *USFS Road Miles by Maintenance Level.* USDA Forest Service. July 2017.

[65]USDA Forest Service. *The Rising Cost of Wildfire Operations: Effects on the Forest Service's Non-Fire Work.* USDA Forest Service Report. August 4, 2015.

[66]There are some minor discrepancies between different Forest Service data sources. We used the figures that appeared to be more accurate. *CMLG Accomplishments. 2008-2017.* USDA Forest Service. July 2017.

[67]Wildlands CPR and The Wilderness Society. *Restoration in Action: The First Five Years of the Legacy Roads and Trails Program.* Wildlands CPR and The Wilderness Society. February 2013.

Mile BY Mile

Ten Years of
Legacy Roads
and Trails Success