Nos. 11-338 and 11-347

IN THE

Supreme Court of the United States

DOUG DECKER, IN HIS OFFICIAL CAPACITY AS OREGON STATE FORESTER, ET AL.,

Petitioners,

v.

NORTHWEST ENVIRONMENTAL DEFENSE CENTER,

Respondent.

GEORGIA-PACIFIC WEST, INC., ET AL.,

Petitioners,

v.

NORTHWEST ENVIRONMENTAL DEFENSE CENTER,

Respondent.

On Writ of Certiorari to the
United States Court of Appeals for the Ninth Circuit

BRIEF FOR AMICI CURIAE WESTERN DIVISION OF THE AMERICAN FISHERIES SOCIETY *ET AL.* IN SUPPORT OF RESPONDENT

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STATEMENT OF INTEREST[1]

Amici curiae are a professional scientific society and two individual scientists who specialize in the area of fisheries biology as well as watershed conservation and restoration. They have a strong interest in the protection of freshwater ecosystems and aquatic species from water pollution caused by stormwater run-off from industrial logging roads. All have been concerned about the issue of sediment pollution from logging roads for decades. Amici believe that the Ninth Circuit's decision will help control the continued, pervasive, and harmful pollution of rivers and streams from forest logging roads.

The Western Division of the American Fisheries Society (WDAFS) is a 3,000 member professional society representing fishery scientists and managers working in academia, government, non-governmental organizations, and the private sector. The WDAFS includes ten Chapters representing Society members residing in the States of Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming; U.S. associated entities in the West Pacific Ocean; the Province of British Columbia and the Yukon Territory in Canada; and Mexico. The mission of the WDAFS is to improve the conservation and sustain-

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[1] All parties have filed letters of blanket consent to the filing of amicus curiae briefs. Pursuant to Supreme Court Rule 37.6, Amici certify that no counsel for any party authored this brief in whole or in part, and that no person or entity, other than Amici Curiae or their counsel, has made a monetary contribution to the preparation and submission of this brief.

ability of fisheries resources and aquatic ecosystems by advancing fisheries and aquatic science.

Dr. Christopher A. Frissell is a research scientist in the field of freshwater ecology and conservation, with an emphasis on salmonid fish of the western United States. Dr. Frissell has worked as a Research Assistant Professor at Oregon State University and the University of Montana, a Research Associate Professor and Affiliate Research Associate Professor at The University of Montana, and a Senior Staff Scientist and Director of Science and Conservation with Pacific Rivers Council. Dr. Frissell has Ph.D. and M.S. degrees in Fisheries Science from Oregon State University, and a B.A. in Zoology from The University of Montana. He has been a member of the American Fisheries Society for more than 30 years. He has published numerous journal articles, book chapters, and books on the subject of salmonid fish conservation and restoration ecology, including the environmental effects of logging roads on salmon habitat and populations. Dr. Frissell has also conducted field research in streams and rivers across Oregon, with a focus on forestry-related land uses and their impact on watersheds and salmon habitat, as well as served as a technical expert for the Oregon Department of Forestry on various forestry and aquatics issues.

Richard K. Nawa is a staff ecologist for the Klamath-Siskiyou Wildlands Center in Ashland, Oregon. Mr. Nawa holds a Masters Degree in zoology from Southern Illinois University. He was also previously employed by Tioga Resources, Inc., in Roseburg, Oregon, to write stream survey reports for streams on U.S. Forest Service lands. Mr. Nawa has been an active member of the Oregon chapter of the American Fisheries Society since 1988.

In this brief, Amici discuss the aquatic and natural resource protection problems caused by polluted water directed into rivers and streams through pipes, ditches, and channels from industrial forest logging roads. We do not address the legal arguments of the case in chief.

SUMMARY OF ARGUMENT

Protection and restoration of our nation's water quality is a fundamental tenet of the Clean Water Act. Water pollution caused by stormwater run-off from industrial logging roads, primarily in the form of excess sediment, harms all stages of aquatic life. Yet despite research showing both the harm from logging road run-off and the need to control it, individual states continue to allow large amounts of pollution from logging roads to enter our rivers and streams through pipes, ditches, and channels. This pollution in turn harms and kills fish and other aquatic organisms essential to a healthy watershed. Application of the point source permitting system to industrial logging roads is an essential tool for regulators to lessen the degradation of our nation's waterways.

ARGUMENT

I. THE NEED FOR HEALTHY WATERS

Water is the life blood of the landscape. Healthy rivers, streams, and wetlands play central roles in both human and natural environments. They moderate periods of drought and flood, provide cool, clean water to drink, and host diverse communities of plants and animals when in good condition. However, the precipitous decline of many aquatic species reveals that the nation's waters are in peril.

Pacific Coast salmon[2] provide a particularly sobering example of the inadequacy of aquatic conservation efforts. Most salmonids are "anadromous." This means that salmon eggs are hatched and the young reared for the first portion of their life cycle only in freshwater streams, primarily in forested areas. As juveniles, they migrate downstream to occupy salt water estuaries and coastal wetlands, where they adapt to ocean conditions. They then spend their next three to five years growing to maturity in the ocean, after which they migrate back to their native river systems, eventually returning to the very same stream from which they were spawned in order to lay their eggs for the next generation.

Because salmon are genetically adapted to each particular river system, Pacific salmon are especially sensitive to the health of their inland watersheds. The life needs of various salmonid species vary, but several—including coho salmon, cutthroat, and steelhead—are particularly dependent on upriver forest habitat. Salmon need cold, clear water, widespread gravel beds with little fine silt in which to deposit their eggs, and abundant pools where their young can find food and shelter.

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[2] As used in this brief and as most commonly used, the term "salmon" means any of seven major species of fish which are members of the genus *Oncorhynchus,* which includes chinook or king salmon (*Oncorhynchus tshawtscha*), coho or silver salmon (*Oncorhynchus kisutch*), coastal searun cutthroat (*Oncorhynchus clarki clarki*), steelhead (*Oncorhynchus mykiss*), chum salmon (*Oncorhynchus keta*), pink salmon (*Oncorhynchus gorbuscha*) and sockeye or red salmon (*Oncorhynchus nerka*). As a genus, these species are also often lumped together and called "salmonids."

Yet largely as a result of widespread inland habitat destruction by human activities, many wild Pacific salmon runs are facing extinction. According to a 1991 comprehensive scientific stock assessment by the American Fisheries Society (the largest organization of fisheries scientists in the world), 214 distinct stocks of anadromous fish in California, Idaho, Oregon, and Washington were identified as at risk of extinction, and the same report noted over 100 stocks already gone forever.[3] Since that 1991 report was written, 28 populations of salmonids have been listed for protection under the federal Endangered Species Act.[4]

Salmon, however, are only the tip of the iceberg. Over seventy percent of native freshwater mussels are vulnerable to extinction.[5] The current and projected extinction rate for freshwater animal species is five times higher than for terrestrial species.[6] North

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[3] W. Nehlsen *et al.*, *Pacific Salmon at the Crossroads: Stocks at Risk from California, Oregon, Idaho, and Washington,* FISHERIES, 16(2):4-21 (March-April 1991), *available at* http://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/deltaflow/docs/exhibits/sfwc/spprt_docs/sfwc_exh3_nehlsen.pdf (last visited Oct. 15, 2012).

[4] Endangered Species Act Status of West Coast Salmon and Steelhead, *available at* http://www.nwr.noaa.gov/ESA-Salmon-Listings/upload/1-pgr-8-11.pdf (last visited Oct. 15, 2012).

[5] J.D. Williams *et al.*, *Conservation Status of Freshwater Mussels of the United States and Canada,* FISHERIES, 18(9):6-22 (1993).

[6] A. Ricciardi and J.B. Rasmussen, *Extinction Rates of North American Freshwater Fauna,* CONSERVATION BIOLOGY, 13:1220-22 (1999).

American amphibians also show a similarly acute incidence of extinction and range contraction.[7]

The loss of aquatic diversity is an economic, as well as biological, disaster. In the 1990s, reductions in salmon catches from California to Alaska resulted in losses of hundreds of millions of dollars to local and regional economies.[8]

In addition to producing commercially extractable resources such as salmon, healthy watersheds provide a variety of economically valuable ecosystem-based services—such as clean air and water, scenic beauty, recreational opportunity, and wildlife—that have real implications for the vitality of many local economies. Clean water has been recognized widely as a valuable ecosystem service that is vulnerable to watershed degradation and worth a considerable monetary investment to secure.

> [W]hile most Americans may live in urban areas, most of us are also dependent upon rural lands, particularly forest lands for clean water and a healthy climate. For these reasons, conserving our forests is not a luxury. It is, in my view, a necessity.

U.S. Department of Agriculture Secretary Thomas Vilsack.[9] Local municipalities have discovered that

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[7] AMPHIBIAN DECLINES: THE CONSERVATION STATUS OF UNITED STATES SPECIES (M. Lanoo, ed., 2005).

[8] *See generally* Amicus Br. of Pacific Coast Federation of Fishermen's Associations *et al.*

[9] U.S. Department of Agriculture Secretary Thomas Vilsack, Remarks on Forest Management in Seattle, Washington (Aug. 14, 2009), *available at* http://www.fs.fed.us/video/tidwell/vilsack.pdf (last visited Oct. 15, 2012).

the most cost-effective water treatment plant is a healthy watershed and—like Portland, Oregon and New York City—have invested heavily in efforts to permanently protect and restore the integrity of the watershed from which they derive their water. *See also* Roadless Area Conservation Rule, 66 Fed. Reg. 3244, 3245 (Jan. 12, 2001) (more expensive treatment of municipal drinking water supplies necessary when forested watersheds not protected).

II. FOREST LOGGING ROADS POSE A MAJOR THREAT TO THE HEALTH OF OUR NATION'S RIVERS AND STREAMS.

A. Forest Logging Roads Deliver Harmful Sediment and Other Pollutants to Rivers and Streams.

Global, national, regional, and local assessments consistently identify logging roads as among the foremost and lasting threats to watershed condition, water quality, aquatic diversity, and fisheries.[10] Logging roads—carefully engineered surfaces of crushed rock and gravel—gradually wear away under the

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[10] *See, e.g.,* Forest Ecosystem Management and Assessment Team (USDA Forest Service, BLM, USFWS, NOAA, EPA and National Park Service), *Forest Ecosystem Management: An Ecological, Economic and Social Assessment* (1993); T. Quigley *et al.*, *Integrated Scientific Assessment for Ecosystem Management in the Interior Columbia Basin,* US Forest Service General Technical Report PNW-GTR-382 (1996); R.T.T. Forman and L.E. Alexander, *Roads and Their Major Ecological Effects,* ANNUAL REVIEW OF ECOLOGY AND SYSTEMATICS, 29:207-31 (1998); H. Gucinski *et al.*, *Forest Roads: A Synthesis of Scientific Information,* US Forest Service General Technical Report PNW-GTR-509 (2001); K.H. Ritters and J.D. Wickham, *How Far to the Nearest Road*? FRONTIERS IN ECOLOGY AND ENVIRONMENT, 1:125-29 (2003).

combination of heavy logging trucks and falling rain. *See* Respondent's Br. at 6-7. These roads, with manmade pipes, ditches, and channels that send stormwater into rivers and streams, alter the chemical, biological, and human use aspects of ecosystems within at least several hundred meters of the road's location. The photograph below shows sediment-laden stormwater from an industrial logging road directed through such pipes and ditches.


[11]

By altering hydrology and generating sediment and nutrients, roads alter aquatic ecosystems. The impact of logging roads can threaten aquatic species and water quality for domestic or commercial users many kilometers downstream.[12]

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[11] Sediment from private logging road collects in roadside ditches, washes into channel that passes through culvert, then flows into the Lewis and Clark River, a major salmon stream in Northwest Oregon. Jan. 27, 2005. Photo: C.A. Frissell.

[12] S.C. Trombulak and C.A. Frissell, *Review of Ecological Effects of Roads on Terrestrial and Aquatic Communities,* CON-

(*Footnote continued*)

As the Forest Service recently explained, "[e]xpansive road networks [ ] can impair water quality, aquatic habitats, and aquatic species in a number of ways, often to a greater degree than any other activities conducted in forested environments. … These deteriorating road conditions threaten our ability to manage forests and pose significant risks to watersheds."[13] And as the federal expert fisheries agency emphasized, "[r]oad networks in many upland areas of the Pacific Northwest are the most important source of management-accelerated sediment delivery to anadromous fish habitats. The sediment contribution to streams from roads is often much greater than that from all other land management activities combined."[14]

The acknowledged harm to watersheds and aquatic resources from logging roads is expected to increase under nearly all projected climate change scenarios.[15] Increased storm intensity, transition

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SERVATION BIOLOGY, 14(1):18-30 (2000); J.A. Jones *et al.*, *Effects of Roads on Hydrology, Geomorphology, and Disturbance Patches in Stream Networks,* CONSERVATION BIOLOGY, 14:76-85 (2000).

[13] USDA Forest Service, Water, Climate Change, and Forests: Watershed Stewardship for a Changing Climate (June 2010) at 72, *available at* http://www.fs.fed.us/pnw/pubs/pnw_gtr812.pdf (last visited Oct. 15, 2012).

[14] Factors for Decline: A Supplement to the Notice of Determination for West Coast Steelhead Under the Endangered Species Act (Aug. 1996) at 19, *available at* http://www.nwr.noaa.gov/ESA-Salmon-Listings/Salmon-Populations/Reports-and-Publications/upload/stlhd-ffd.pdf (last visited Oct. 15, 2012) (citations omitted).

[15] J. Battin *et al.*, *Projected Impacts of Climate Change on Salmon Habitat Restoration,* PROCEEDINGS OF THE NATIONAL

(*Footnote continued*)

from snowmelt to rainfall-dominated hydrology, and increased extent and frequency of rain-on-snow-driven floods all tend to increase the role of logging roads in diverting surface flow and the vulnerability of these roads to erosion.

Federal, state, and local agencies have long acknowledged the pollution problem posed by forest logging roads. As the U.S. Environmental Protection Agency (EPA) has explained, "[r]oads are considered to be the major source of erosion from forested lands, contributing up to 90 percent of the total sediment production from forestry operations."[16] Nationwide, EPA identifies sediment as the second largest identified cause of water quality impairment, with the related categories of habitat alteration (6th), temperature (10th), and turbidity (15th) following. Forestry (silviculture), including road construction and use, is listed as the 11th largest probable source group for this pollution.[17]

According to an EPA-commissioned report, "forestry-related sediment is a leading source of water

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ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA, 104:6720-25 (2007); M.J. Furniss *et al.*, *Water, Climate Change, and Forests: Watershed Stewardship for a Changing Climate,* US Forest Service General Technical Report PNW-GTR-812 (2010).

[16] Coastal Waters Guidance, Chapter 3.I.E.2, "Road Construction and Use," *available at* http://www.epa.gov/owow/nps/MMGI/Chapter3/ch3-1.html (last visited Oct. 15, 2012).

[17] EPA, Watershed Assessment, Tracking and Environmental Results: National Summary of State Information, http://ofmpub.epa.gov/waters10/attains_nation_cy.control (last visited Oct. 15, 2012) (compiling most current available data from states' Clean Water Act lists of impaired waters).

quality impairment to rivers and streams nationwide." National Level Assessment of Water Quality Impairments Related to Forest Roads and Their Prevention by Best Management Practices (2008) at 2.[18] While many logging roads are designed to discharge stormwater onto the forest floor, *see* Respondent's Br. at 7, in certain areas in the Pacific Northwest, a large percentage of this sediment-laden water directly enters rivers and streams through engineered logging road drainage systems—manmade pipes, ditches, and channels. National Level Assessment at 43-44, 49; *see also* Oregon Dep't of Forestry, Forest Roads, Drainage and Sediment Delivery in the Kilchis River Watershed (1997) at 4-5.[19]

The water quality problems with salmon habitat on private forestlands have long been recognized. In 1998, the Oregon Department of Environmental Quality listed more than 3,000 stream miles on private forestlands statewide as violating water quality standards. Over 25% of the waters designated as impaired for temperature, sediment, and habitat modification occurred on private forestlands. The percentages are even higher in the North Coast region of Oregon.

The in-the-river situation in Oregon has not improved with time. Oregon's 2006 list of impaired waters includes approximately 12,000 stream miles listed as violating water quality standards for sedi-

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[18] *Available at* http://www.wildlandscpr.org/national-level-assessment (last visited Oct. 15, 2012).

[19] *Available at* http://www.oregon.gov/odf/privateforests/docs/kilchis.pdf (last visited Oct. 15, 2012).

ment or turbidity.[20] Similarly, hundreds of thousands of river miles in states across the nation are impaired by sediment pollution.[21]

B. Sediment Impacts on Fish and Aquatic Life.

Both fine and coarse-grained sediment harms water quality and aquatic species. National Level Assessment at 16-20, 31-38. For salmon, excess sediment hurts all freshwater life-stages—migration, spawning, egg incubation, and juvenile rearing.

Coho salmon provide a good example of the various freshwater habitat requirements most anadromous fish need to survive. Across their freshwater life stages, coho salmon tend to benefit from habitat that is relatively cold and near natural levels of fine and suspended sediment.

Adult coho salmon return to their natal spawning tributaries to construct nests in which to deposit and fertilize their eggs. As they ascend the river and enter smaller streams nearer spawning areas, migrating adult fish require cool waters with deep pools and woody debris or other structure to provide shelter from predators. Spawning migrations and breeding

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[20] Site-specific Targeted Monitoring Results: Causes of Impairment, Oregon Rivers and Streams 2006, *available at* http://ofmpub.epa.gov/waters10/attains_state.control?p_state=OR (last visited Oct. 15, 2012).

[21] EPA, Watershed Assessment, Tracking and Environmental Results: Causes of Impairment in Assessed Rivers and Streams, *available at* http://ofmpub.epa.gov/waters10/attains_nation_cy.control (last visited Oct. 15, 2012) (interactive map linking to individual state lists of pollution, by type, in rivers and streams).

take place from September through March in most coastal streams where wild coho salmon remain.

Eggs remain in and develop in the gravel for two to three months, during which time they require cold temperatures, free exchange of highly oxygenated waters, and stable streambeds. Larvae emerge from the eggs and remain relatively inactive within the gravel streambed interstices until they move into the water column and become mobile. Once the larvae become free-swimming, they require food and clean water in which to see and capture that food. The young fish are also vulnerable to downstream displacement by late season floods.

As the juvenile fish enter summer, they grow rapidly until stream temperatures grow too high, and physiological demands outweigh available food resources. As fall and winter months approach, juvenile coho migrate to deeper pools and beaver ponds to shelter from winter storms. The juveniles spend the rainy and flood-rich winter months in these sheltering habitats, then most turn downstream and migrate to the sea as smolts in the spring months of their second year of freshwater residence.

Increased river sedimentation affects all these life-stages. During the two to three months that salmon eggs incubate in the gravel at the river bottom, increased fine sediment in the water reduces available oxygen. More directly, sediment can bury and smother eggs. Increased sediment loads can also cause streambeds to become unstable,[22] leading to

[22] C.A. Frissell *et al.*, *A Resource in Crisis: Changing the Measure of Salmon Management,* PACIFIC SALMON AND THEIR ECOSYSTEMS (D.J. Stouder *et al.* eds. 1997) at 411-44.

the scouring of the river bottom—salmon eggs and all.

Suspended sediments can act directly on fish by killing them. Common sublethal effects, such as reduced growth of juvenile coho that contribute to mortality later in the life cycle, affect a larger area of habitat and more individuals. Excess sediment can interfere with developing eggs and larvae, reduce the abundance of food for fish, and reduce the ability of fish to catch their prey.[23]

> [E]ffects of sedimentation on salmonids are well-documented and include: clogging and abrasion of gills and other respiratory surfaces; adhering to the chorion or eggs; providing conditions conducive to entry and persistence of disease-related organisms; inducing behavioral modifications; entombing different life stages; altering water chemistry by adsorption of chemicals; affecting useable habitat by scouring and filling pools and riffles and changing bedload composition; reducing photosynthetic growth and primary production; and affecting intergravel permeability and dissolved oxygen levels.[24]

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[23] C.P. Newcombe and D.D. MacDonald, *Effects of Suspended Sediments on Aquatic Ecosystems,* NORTH AMERICAN JOURNAL OF FISHERIES MANAGEMENT, 17:72-82, 73 (1991).

[24] Factors for Decline: A Supplement to the Notice of Determination for West Coast Steelhead Under the Endangered Species Act (Aug. 1996) at 17, *available at* http://www.nwr.noaa.gov/ESA-Salmon-Listings/Salmon-Populations/Reports-and-Publications/upload/stlhd-ffd.pdf (last visited Oct. 15, 2012).

The expert federal fisheries agency has identified increased in-stream sediment, particularly from timber harvest and road construction and use, as a leading cause of the decline that has led to protection of salmon populations under the Endangered Species Act. Threatened Status for Southern Oregon/ Northern California Coast Evolutionarily Significant Unit of Coho Salmon, 62 Fed. Reg. 24,588, 24,593 (May 6, 1997) ("Forestry has degraded coho salmon habitat through removal and disturbance of natural vegetation, disturbance and compaction of soils, construction of roads, and installation of culverts."); Threatened Status for the Oregon Coast Coho Salmon Evolutionarily Significant Unit, 76 Fed. Reg. 35,755, 35,766 (June 20, 2011) ("Historical and ongoing timber harvest and road building have reduced stream shade, increased fine sediment levels, reduced levels of instream large wood, and altered watershed hydrology.").

The harm from increased sediment in rivers and streams is not limited, of course, to salmon. Other fish and freshwater animals face similar difficulties from reduced oxygen, altered water chemistry, and limited visibility in murky streams. Bull trout, listed as a threatened species, are particularly sensitive to sediment pollution. When a federal expert biological agency specifically looked at the impacts of road management activities on bull trout, it noted that "[e]xisting roads are considered a primary source of sediment-related impacts to bull trout … and were part of the rationale for listing bull trout as threatened."[25] Aquatic invertebrates—prey for salmon and other fish—also decline in streams with increased sediment, as do aquatic plants due to less available sunlight. In short, while the word "pollution" may first bring to mind images of toxic chemical compounds, sediment from logging roads just as surely kills and harms fish and aquatic life in rivers and streams across the nation.

III. NON-POINT SOURCE CONTROLS DO NOT PROTECT WATER QUALITY FROM HARMFUL ROAD IMPACTS.

While Clean Water Act point source permitting programs have successfully reduced water pollution, non-point source programs under the Act have been ineffective. *See* National Research Council, ASSESSING THE TMDL APPROACH TO WATER QUALITY MANAGEMENT (2001) at 1 ("Although successful, the NPDES [point source permit] program has not achieved the nation's water quality goals of "fishable and swimmable" waters largely because discharges from other unregulated nonpoint sources of pollution have not been as successfully controlled. Today, pollutants such as nutrients and sediment … are jeopardizing water quality….").

Best management practices, lauded by other amici, have largely failed.[26] Amici Pacific Legal Founda-

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[25] U.S. Fish and Wildlife Service, Biological Opinion of the Effects to Bull Trout and Bull Trout Critical Habitat from Road Management Activities on National Forest System and Bureau of Land Management Lands in Western Montana (2008) at 8, *available at* http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5336500.pdf (last visited Oct. 15, 2012).

[26] F.A. Espinosa *et al.*, *The Failure of Existing Plans to Protect Salmon Habitat in the Clearwater National Forest in Idaho,*
(*Footnote continued*)

tion touts the number of states with Best Management Practice programs for forestry generally, Pacific Legal Foundation Br. at 10-11, but those numbers are meaningless unless also linked to their efficacy. The continued identification of rivers and streams polluted by sediment from logging and industrial logging roads belies any claims that current measures to control this pollution are effective. The plight of the Pacific chorus frog in the photograph below, like the harm to salmon discussed above, serves as an indicator of the wider harm that entire aquatic ecosystems suffer when subjected to excess sediment pollution.

[27]

JOURNAL OF ENVIRONMENTAL MANAGEMENT 49:205-30 (1997) (documenting the failure of Best Management Practices on U.S. Forest Service land to protect salmon and their habitat).

[27] Mud-caked Pacific chorus frog in spring breeding wetland habitat filled with sediment delivered from ditches of an adjacent logging road, Elliot State Forest, Oregon. March 15, 2007. Photo: C.A. Frissell.

In renewing protection for Oregon coast coho salmon, the federal expert biological agency particularly noted that Oregon's forestry rules do not adequately protect salmon.

> [S]ignificant concerns remain over the[] ability [of the Oregon forestry rules] to adequately protect water quality and salmon habitat. ... Since there are no limitations on cumulative watershed effects, road density on private forest lands, which is high throughout the range of this [salmon population], is unlikely to decrease.

76 Fed. Reg. at 35,767.[28] *See also* Scientific Conclusions of the Status Review for Oregon Coast Coho Salmon, NOAA Technical Memorandum NMFS-NWFSC-118 (June 2012) at 76-78 (documenting negative correlation between coho productivity and high logging road densities).[29] It is impossible to square these facts with the great praise heaped on best management practices in this case.

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[28] Oregon is not alone in having high road densities on private lands. As amici Pacific Legal Foundation notes (at 15, n.7), there may be up to six miles of forest road per square mile of private forest land in parts of California. The road less traveled, it appears, is not part of our nation's forested landscape.

[29] *Available at* http://www.nwfsc.noaa.gov/assets/25/8714_08132012_121939_SROregonCohoTM118WebFinal.pdf (last visited Oct. 15, 2012); *see also* J.C. Firman *et al.*, *Landscape Models of Adult Coho Salmon Density Examined at Four Spatial Extents,* TRANSACTIONS OF THE AMERICAN FISHERIES SOCIETY, 140:440-55 (2011) (finding that as road densities increased in small Oregon streams, spawning coho salmon decreased).

CONCLUSION

Industrial logging roads that channel sediment pollution through pipes and ditches directly into rivers and streams harm fish and other aquatic organisms. Until this direct pollution is addressed, the health of our nation's watersheds remains at risk. For the foregoing reasons, Amici respectfully ask this Court to affirm the decision below.

Respectfully submitted,

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