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LAND MANAGEMENT AGENCIES

Restoring Fish Passage on Federal Lands in Oregon and Washington Could Take Decades

Statement of Barry T. Hill, Director
Natural Resources and Environment

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Mr. Chairman and Members of the Subcommittee

We are pleased to be here today to discuss the condition of culverts on fish-bearing streams in Oregon and Washington and the federal efforts to identify and restore culverts that are impeding fish passage on Bureau of Land Management (BLM) and Forest Service lands. Our testimony today is based on our recent report, which described (1) the number of culverts that may impede fish passage on BLM and Forest Service lands in Oregon and Washington, (2) the factors affecting the agencies' ability to restore passage through culverts acting as barrier culverts, and (3) the results of the agencies' efforts to restore fish passage.[1]

In summary, Mr. Chairman, we found the following:

Over 10,000 culverts exist on fish-bearing streams in Oregon and Washington, according to BLM and the Forest Service estimates, but neither agency knows the total number that impede fish passage. Recently completed and ongoing agency inventory and assessment efforts have already identified nearly 2,600 barrier culverts, but agency officials estimate that more than twice that number may exist. The Forest Service completed its assessment in late 2001. The Bureau of Land Management has not set a specific completion date for assessing all culverts but intends to continue assessing them as part of its ongoing land management planning efforts. According to officials, both agencies intend to use the assessments to assist them in planning and setting priorities for eliminating barrier culverts. Based on August 2001 assessments, the agencies estimate that efforts to restore fish passage may ultimately cost over $375 million and take decades.

Although the agencies recognize the importance of restoring fish passage, several factors are inhibiting their efforts. Most significantly, the agencies have not made sufficient funds available to do all the culvert project work necessary. In allocating road maintenance funds, the agencies assign a relatively low priority to such fish passage projects because road safety is a higher priority than resource protection. As a result, the agencies allocate most maintenance funding to their large road maintenance backlogs rather than to culvert projects. In addition, the often lengthy

[1] U. S. General Accounting Office, *Land Management Agencies: Restoring Fish Passage Through Culverts on Forest Service and BLM Lands in Oregon and Washington Could Take Decades*, GAO-02-136 (Washington, D.C. Nov. 23, 2001).

process of obtaining federal and state environmental clearances and permits to perform culvert work, as well as the short seasonal "window of opportunity" to do the work, affects the agencies' ability to restore fish passages quickly. Furthermore, the shortage of experienced engineering staff limits the number of projects that the agencies can design and complete. Currently, each barrier removal project generally takes 1 to 2 years from start to finish.

The Forest Service and BLM completed 141 culvert projects from fiscal year 1998 through August 1, 2001, to remove barriers to anadromous fish and to open an estimated 171 miles of fish habitat. Neither agency, however, knows the extent to which culvert projects ultimately result in improved fish passage because neither agency requires systematic post-project monitoring to measure the outcomes of their efforts. The agencies say they do not perform post-project monitoring because of limited funding and staff availability and, according to agency officials, because they assume culverts built using current standards on lands under their jurisdiction should allow fish passage. State and local entities using these same standards, however, require systematic post-project monitoring to ensure that they used the most effective methods for improving fish passage under various conditions. Oregon's monitoring results, for example, indicate that retrofitting culverts with devices that slow the flow of water can effectively restore fish passage. Without monitoring, neither the Forest Service nor BLM can ensure that the federal moneys expended to improve fish passage are actually achieving the intended purpose.

We recommended that both agencies develop guidance for systematically assessing completed barrier removal projects to determine whether they are improving fish passage as intended. The agencies agreed with our recommendation for systematic monitoring.

Background

BLM and the Forest Service manage about 93 percent of the 44 million acres of federally owned land in Oregon and Washington. BLM's Oregon State Office manages about 17 million acres of land in the two states, including over 28,000 miles of roads. The state office directs the operations of 10 district offices—9 in Oregon and 1 in Washington—each responsible for managing BLM's public land resources within their geographic jurisdiction. Six of the Oregon districts contain Oregon and California Grant Lands, distributed in a checkerboard pattern within each district, and interspersed within and around the federal lands are state and private lands. The Forest Service's Region 6 manages about 25 million acres of land in the two states, including nearly 94,000 miles of roads.

Region 6 directs the operations of 19 national forests—13 in Oregon and 6 in Washington. BLM's district offices and the Forest Service's national forest offices perform similar land management functions, including restoring fish and wildlife habitat and designing, constructing, and maintaining roads.

Maintaining fish passage and habitat is particularly important for anadromous fish, which as juveniles migrate up and down stream channels seasonally, then travel from their freshwater spawning grounds to the ocean, where they mature, and finally return to their spawning grounds to complete their life cycle. Under the authority of the Endangered Species Act, the National Marine Fisheries Service currently lists four species of salmon—including Coho, Chinook, Chum, and Sockeye—as well as steelhead and sea-run trout as either threatened or endangered anadromous fish in the northwest region.

Culverts—generally pipes or arches made of concrete or metal—are commonly used by BLM and the Forest Service to permit water to flow beneath roads where they cross streams, thereby preventing road erosion and allowing the water to follow its natural course. Culverts come in a variety of shapes and sizes designed to fit the circumstances at each stream crossing, such as the width of the stream or the slope of the terrain. Historically, agency engineers designed culverts for water drainage and passage of adult fish. However, as a culvert ages, the pipe itself and conditions at the inlet and outlet can degrade so that even strong swimming adult fish cannot pass through the culvert. The agencies remove, repair, or replace culverts to restore fish passage.

Extent to Which Barrier Culverts Block Fish Passage Is Unknown

According to BLM and Forest Service estimates, over 10,000 culverts exist on fish-bearing streams in Oregon and Washington, but neither agency knows the total number that impede fish passage. Both agencies are inventorying and assessing the condition of the culverts on their lands. BLM's district offices are assessing fish passage through culverts as part of its ongoing watershed analysis, and each BLM district office maintains its own records on barrier culverts on its lands. As of August 1, 2001, BLM's district offices had assessed 1,152 culverts for fish passage and identified 414 barrier culverts. Based on assessments at that time, BLM estimated that an additional 282 barrier culverts may be identified, for a total of 696 culverts blocking fish passage.

The Forest Service initiated a regionwide assessment of culverts on fish-bearing streams in fiscal year 1999 to determine the scope of fish passage

problems and to create a database of culvert information that will allow it to prioritize projects to address barrier culverts regionwide. Although the region recently completed its field assessment, the final data are not yet available because the region is still entering it into its database. However, at the time of our review, the forest offices had assessed 2,986 culverts for fish passage and identified 2,160—or about 72 percent—as barrier culverts. Using its data as of August 2001, the Forest Service estimates that an additional 2,645 barrier culverts may be identified, for a total of 4,805 culverts blocking fish passage.

Although BLM and the Forest Service are currently addressing barrier culverts using the assessment information they had collected as of August 1, 2001, agency officials estimate that it may cost over $375 million and take decades to restore fish passage at all barrier culverts. BLM officials estimate a total cost of approximately $46 million to eliminate its backlog of about 700 barrier culverts, while Forest Service officials estimate a total cost of about $331 million to eliminate its backlog of approximately 4,800 barrier culverts. At the current rate of replacement, BLM officials estimate that it will take 25 years to restore fish passage through all barrier culverts, and Forest Service officials estimate that they will need more than 100 years to eliminate all barrier culverts. Furthermore, these estimates do not reflect any growth in the backlog due to future deterioration of culverts that currently function properly.

Several Factors Affect Agencies' Ability to Eliminate Barrier Culverts Quickly

According to BLM and Forest Service officials, four primary factors restrict their ability to quickly address the long list of problem culverts.

First, the agencies assign a relatively low priority to culvert projects when allocating road maintenance funds because ensuring road safety is the top priority for road maintenance, repair, and construction funds. Both agencies emphasize reducing the backlog of road maintenance rather than correcting barrier culverts. In fiscal year 2001, BLM's funding for road maintenance totaled about $6 million, but according to officials, the agency needed about $32 million to meet annual maintenance needs, including culverts. The Forest Service's funding for road maintenance totaled about $32 million in fiscal year 2001, but according to officials, the agency needed about $129 million to meet its annual maintenance needs, including culverts. Because neither agency requests funds specifically for barrier culvert projects, district and forest offices must fund these restoration projects within their existing budgets, and these projects must compete with other road maintenance projects for the limited funds.

Therefore, to restore fish passage, the agencies largely rely on other internal or external funding sources not dedicated to barrier removal. BLM's district offices reported that since fiscal year 1998 they have relied almost entirely on Jobs-In-The-Woods program funding, which seeks to support displaced timber industry workers within BLM's Oregon and California Grant Lands. Likewise, national forest offices reported that since fiscal year 1998 they have primarily relied on funding from the Federal Highway Administration and the National Forest Roads and Trails funds for projects to restore anadromous fish passage at barrier culverts. These funding sources, however, are not guaranteed from year-to-year. For example, because of severe flooding in recent years and widespread damage to culverts, forest offices obtained Federal Highway Administration funds to replace damaged culverts and concurrently ensure that these culverts meet current fish passage standards. While such funds enabled the forest offices to address barrier culverts, the forest offices cannot rely on future floods to ensure a steady stream of funding for such projects.

Second, the number of fish passage projects the agencies can undertake and the speed with which they complete them depends largely on how long it takes to obtain the various federal and state clearances necessary to implement a culvert project. Under the National Environmental Policy Act, an assessment of each project's impact on the environment must be completed before construction can begin. If the assessment indicates that an endangered species may be adversely affected by the project, section 7 of the Endangered Species Act of 1973 requires the agency to consult with the appropriate authority—generally the National Marine Fisheries Service for anadromous fish and the Fish and Wildlife Service for other species—to reach agreement on how to mitigate the disturbance.

Third, the limited number of engineers available to design culverts, and more specifically, the few with experience in designing culverts that meet current fish passage requirements, restricts the agencies' efforts to eliminate barrier culverts. As a result, district and forest officials speculate that additional hiring or contracting with engineering firms for culvert design work may be necessary if greater emphasis is placed on reducing the barrier culvert backlog. Agency officials also emphasized the need for more fish biologists, hydrologists, and other professionals with fish passage design skills.

Finally, in order to minimize the disturbance to fish and wildlife habitat, states impose a short seasonal "window of opportunity" when restoration work on barrier culverts can occur. The summer to fall in-stream work

time frames, when construction is most feasible because the water flow is low, most commonly run from July to September, but could be as narrow as July 15 to August 15, which limits the agencies' efforts to eliminate barrier culverts.

According to BLM and Forest Service officials, the minimum time necessary to complete a barrier culvert project is about 1 year. A delay caused by any one of the factors has a cascading effect on the project completion date. For example, according to agency officials, they generally begin a project by initiating the clearance and permit process and collecting some preliminary engineering information. However, if project clearances are not obtained or imminent by March, when project funding decisions are made, they may delay construction to the next year, rather than commit funds to a project that may not be ready for implementation within the seasonal time frames. Similarly, project clearances may be completed in a timely fashion, but the project may be delayed if an engineer with design experience in fish passage is not available. And, if all phases of a project, including construction contracts, are not in place in time to complete construction within the state-mandated stream construction time frames, the project must be delayed until the next season. Because of the factors discussed, each barrier removal project generally takes 1 to 2 years to complete.

Effectiveness of Agency Efforts to Restore Fish Passage Is Largely Unknown

From fiscal year 1998 through July 2001, the Forest Service and BLM completed 141 culvert projects to remove barriers to anadromous fish and to open an estimated 171 miles of fish habitat. BLM reported completing 68 projects and opening access to an estimated 95 miles of fish habitat and the Forest Service reported completing 73 projects to open access to an estimated 76 miles of fish habitat. Although the agencies know the number of projects and the number of miles of fish habitat opened, neither agency knows the extent to which culvert projects ultimately result in improved fish passage because neither agency requires systematic post-project monitoring to measure the outcomes of their efforts.

According to Forest Service and BLM officials, they do not perform post-project monitoring because of limited funding and staff availability. These officials stated that monitoring all culvert fish passage projects would be a costly and time-consuming effort for their already limited staff. Therefore, district and forest staff stated that following up on culvert projects is generally ad hoc in nature. Each forest and district office is required to conduct monitoring of selected restoration activities, but neither agency specifically requires monitoring barrier culvert projects. Therefore,

restoration projects selected by district and forest offices for monitoring may or may not include barrier culvert passage projects. Consequently, the agencies do not systematically determine whether fish can actually pass through repaired or replaced culverts. Furthermore, while the miles of habitat theoretically made accessible to fish is estimated, the extent to which fish actually inhabit that stream area is not routinely determined. According to BLM and Forest Service officials, in the absence of systematic monitoring, they assume that culverts built to current standards will allow fish migration into the newly accessible habitat. However, even culvert projects built to current standards may not necessarily result in improved fish passage. For example, during our field visits to completed culvert projects, we observed culverts that, according to agency officials, continued to be barriers to fish passage, including a retrofitted culvert that did not sufficiently slow water flow, a replaced pipe that did not allow juvenile fish passage, and a culvert that allowed water to flow under it rather than through it.

Oregon and Washington require systematic post-project monitoring of the state fish passage restoration efforts on their lands, as well as cooperative local programs on other lands within the states. Oregon, Washington, and other entities consider systematic monitoring to be an important tool to determine the most effective methods for improving fish passage under various conditions. The systematic monitoring allows the entities to incorporate the knowledge learned from monitoring efforts into future restoration planning and implementation. Their varied approaches reflect the range of methods available for monitoring—that is, monitoring improvements to water flow at selected culverts of a specific design type, verifying the actual presence of fish in a newly opened habitat, or developing monitoring plans for specific projects. While each monitoring approach requires a commitment of agency staff and funding to implement, they all provide valuable information for targeting future expenditures on culvert passage restoration methods that most benefit fish. Without such systematic monitoring programs, neither the Forest Service nor BLM can ensure that the federal moneys expended for improving fish passage are actually achieving the intended purpose.

Conclusion

BLM and the Forest Service are faced with the daunting task of addressing a large backlog of culverts that block fish passage. Given the limited funding available for fish passage projects and the various factors that affect the agencies' ability to complete projects quickly, eliminating barrier culverts will be a long, costly effort. While both agencies are already using culvert assessment information to help them prioritize projects, this effort

is just the beginning of the barrier elimination process. Ultimately, the culvert projects selected for implementation—whether retrofitting existing culverts, replacing them, or removing them—must achieve the objective of restoring fish passage. Systematic monitoring of completed projects would provide the agencies with information to help them identify which methods actually work best under various circumstances and with evidence that their expenditures have actually improved fish passage. Although monitoring would divert funding and staff from the implementation of projects to improve fish passage, state monitoring programs have demonstrated the value of monitoring to assess the effectiveness of barrier culvert projects and of allowing these entities to incorporate this knowledge into future planning and implementation efforts.

In this context, we recommended that the Director of BLM and the Chief of the Forest Service each develop guidance for systematically monitoring completed barrier removal projects to determine whether these projects are achieving their intended purpose. The guidance should establish procedures that will allow the agencies to cost effectively measure and document improvements to fish passage. Both the Department of the Interior and the Forest Service agreed with our recommendation for systematic monitoring so long as agency officials have the discretion to determine the monitoring approaches and methodologies that will most benefit them in planning and implementing future fish passage projects. We recognize that the agencies will have to exercise discretion in developing this guidance, but they need to ensure that they implement a monitoring program that cost effectively measures and documents improvements to fish passage.

Mr. Chairman, this concludes our prepared testimony. We would be happy to respond to any questions that you and the other Members of the Subcommittee may have.

Contact and Acknowledgements

For further information, please contact Barry T. Hill at (202) 512-3841. Individuals making key contributions to this testimony included Linda Harmon and Brad Dobbins.