Secretary of State Audit Report

Kate Brown, Secretary of State

Gary Blackmer, Director, Audits Division

Oregon Watershed Enhancement Board: Continuing Sound Partnerships and Strategies for Restoration and Protection

Summary

In 1998, Oregonians approved Ballot Measure 66, which dedicated 15% of lottery proceeds, through 2014, to a parks and natural resources fund. Half of the funds are dedicated for state parks, beaches, historic sites and recreation areas, and the other half for restoration and protection of watersheds, fish and wildlife habitats and water quality.

The Legislature established the Oregon Watershed Enhancement Board (OWEB) in 1999 to administer Measure 66 funds dedicated to natural resource protection and restoration. OWEB also administers federal Pacific Coastal Salmon Recovery Funds (PCSRF) and state salmon license plate proceeds. Through June 2009, OWEB had received about $459 million, including $341 million of lottery funds. However, about 27% of the total funds were allocated by the Legislature to other state agencies. OWEB does not control the use of legislatively allocated funds.

OWEB's restoration and protection efforts are guided by the Oregon Plan for Salmon and Watersheds (Oregon Plan), which began in 1995 as a state-led strategy for conserving salmon species listed or headed for listing under the federal Endangered Species Act. Since then the Oregon Plan has expanded from a focus on coastal coho salmon and water quality to address native salmon and steelhead and other native fish in all watersheds of the state.

The Oregon Plan relies on the involvement of private landowners, volunteers and other stakeholders in the actual on-the-ground restoration work. Maintaining and supporting this collaborative process remains a key priority for OWEB.

A watershed is an area of land that drains water to a stream, river, lake, wetland, estuary or ocean. The boundaries of a watershed are measured from ridge to ridge. From the headwaters to the bay, all natural and human activities are connected in a watershed by the flow of water.

Oregon's watersheds are as diverse as its habitat, which spans forests, beaches, mountains and deserts. Along the Oregon coast and the Columbia River, and throughout the Willamette Valley where migrating fish such as salmon are found, watershed restoration projects can include riparian planting, instream work, and fish passage barrier removal. By contrast,

much of Eastern Oregon and some of Southern Central Oregon is considered high desert, where ranching and agriculture are prevalent but water is scarcer. Watershed protection and restoration efforts in these regions are concerned with irrigation, conservation and improvement of water systems, juniper tree removal, and water quality issues stemming from erosion and bacterial contamination.

Our audit found that OWEB has successfully promoted community-based restoration efforts, ensured sound and appropriate remediation, developed productive partnerships with various agencies, and monitored watershed projects to improve its strategies in the future. Nonetheless, the restoration needs in Oregon require a continued commitment from OWEB and its partners, as well as new strategies for applying its resources.

Most notably, OWEB has helped build capacity and sustainability for community-based actions through grants to watershed councils, soil and water conservation districts, landowners and others. These grants fund activities such as technical assistance, watershed restoration projects, education and outreach, and project monitoring. OWEB grants helped improve fish access to rivers and streams, plant native species, manage invasive species, remove dams and other barriers, increase irrigation efficiencies, and promote education and outreach. OWEB's grants also leverage other resources for protection and restoration activities.

In addition to grants, OWEB provided technical guidance for local efforts, and tools such as field guides, a watershed assessment manual, the Oregon Watershed Restoration Inventory, an on-line grants management system and the Oregon Explorer Restoration Viewer, which allows the user to see where watershed restoration projects have been performed in the state.

Our audit also found that since its creation in 1999, OWEB has applied adaptive measures by learning from experience, discussing and applying alternative approaches, and making changes to current programs.

OWEB has developed partnerships with local, state and federal natural resource agencies; tribes; non-profit organizations; and individual citizens. This has allowed it to coordinate activities and respond cooperatively to local watershed protection and restoration efforts. OWEB has worked with numerous agencies and organizations to leverage resources and improve opportunities to protect, enhance and restore the state's watersheds. Through its Special Investment Partnerships OWEB has also contributed funding for targeted, long-term restoration projects in the Deschutes and Willamette basins.

Monitoring watershed improvement projects can demonstrate where restoration funds have been spent, assess whether restoration projects are improving environmental conditions and achieving desired outcomes, determine if target species are benefitting from restoration activities, and inform decision makers on how best to invest resources in the future. OWEB originally led its partners in the creation of an Oregon Plan Monitoring Strategy and an Oregon Plan Information System Strategy, which included developing environmental indicators of watersheds and salmon health. As other state natural resource agencies reduced their

capacity for monitoring, OWEB also began focusing on monitoring its own effectiveness, while still coordinating monitoring efforts with natural resource agencies and organizations.

Recently, Oregonians approved Ballot Measure 76, which continues the constitutional dedication of lottery proceeds for parks, beaches, wildlife habitat, and watershed protection beyond 2014. As OWEB moves forward and builds on existing efforts we recommend it apply the following strategies:

- develop guidance for, and continue to support, the establishment of watershed action plans that address local protection and restoration objectives;
- develop statewide restoration priorities that establish clear, technically defensible, and practicable recovery and restoration objectives on which to base future funding decisions; and,
- continue to work with natural resource agencies and other partners to implement a statewide monitoring plan.

Agency Response

OWEB's response is attached at the end of the report.

Background

In 1998, Oregonians approved Ballot Measure 66, which dedicated 15% of lottery proceeds, through 2014, to a parks and natural resources fund. Half of the funds are dedicated for state parks, beaches, historic sites and recreation areas, and the other half for restoration and protection of watersheds, fish and wildlife habitats and water quality.

Among the provisions of the measure was the requirement that any state agency receiving this money secure an independent audit to measure the financial integrity, effectiveness and performance of the agency. This is the sixth audit report the Oregon Audits Division has issued about the use of Measure 66 funds.

For the 2007-09 biennial report we focused our performance audit on a review of OWEB's efforts to help protect and restore watersheds and other natural habitats. We released a financial audit in July 2010.

Oregon Watersheds Are Extensive and Varied

A watershed is an area of land that drains water to a stream, river, lake, wetland, estuary or ocean (see Figure 1). All of Oregon's 99,996 square miles are within watersheds, which contain over 111,000 miles of flowing water characterized as either a river or stream.

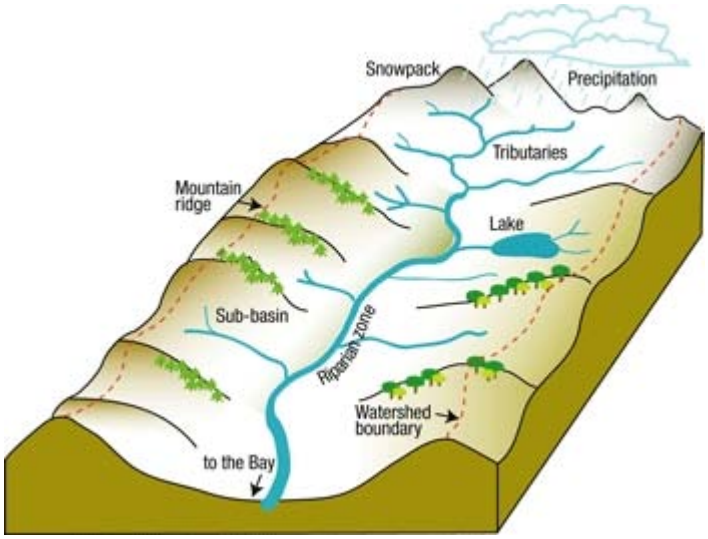

Figure 1: Watershed Illustration. Image Source: The Watershed Project.

Oregon's watersheds are as diverse as its habitat, which spans forests, beaches, mountains and deserts. Along the Oregon coast and the Columbia River, and throughout the Willamette Valley, plentiful rainfall feeds many streams and rivers among the forested mountains, foothills and valleys. A large portion of Oregon's population lives in these watersheds, which also contain industrial, agricultural and other types of development. Ocean-bound migrating fish such as salmon are more common in these watersheds than elsewhere in the state. By contrast, much of Eastern Oregon and some

of Southern Central Oregon is considered high desert, where ranching and agriculture are prevalent but water is scarcer. Many watersheds in Eastern Oregon do not have ocean-bound migrating fish species.

While Oregon contains large tracts of public land managed by the U.S. Forest Service and the U.S. Bureau of Land Management, much streamside land is in private ownership.

Characteristics of Healthy Watersheds

A watershed is connected by the water that flows downstream through tributaries and rivers, surface water and groundwater, and wetlands. Changes that affect the quality, quantity, or rate of movement in one location can change the characteristics of the watershed downstream. Also, the activities on the land interact with the rivers and streams. As such, multiple factors can affect a watershed's health.

When watersheds are healthy and functioning well, they provide food and fiber, clean water, and habitat for native plants and animals. Healthy watersheds move sediment from the mountains to the beaches and bays, sorting it along the way to create diverse landscapes and habitats. They cycle nutrients and convert them into forms that living organisms can use.

Watersheds also purify and store water, and then meter its release into streams to reduce flooding and damaging erosion in the winter and to sustain flows and cool temperatures during the dry season. Well functioning watersheds are more resilient to natural and human-induced disturbances than highly impacted watersheds.

Characteristics of a healthy watershed include:

- water quality and quantity that is sufficient to support native aquatic species;
- streams and floodplains that can accommodate high flows without destructive flooding and erosion;
- stream flows close to historic conditions with moderate peak flows after winter storms and stable summer base flows;
- streams with complex habitat features including pools, gravel bars, and large pieces of wood that support fish and other aquatic wildlife through short-term changes caused by drought, wild fire, landslides, or other events that alter habitat conditions;
- adequate shade that limits extreme water temperatures;
- native, keystone plant and animal species in stable populations;
- riparian corridors with dense, healthy native plant communities that regenerate naturally;
- rivers that meander naturally over time to slow water down and allow sediment deposition;
- upland forests and grasslands managed to promote rain infiltration, diverse native wildlife habitat, reduced soil erosion, and clean water flows to streams; and,
- tidal area connected to wetlands.

Salmon Depend on Healthy Watersheds

Several salmon species inhabit Oregon's watersheds and are viewed as indicators of watershed health. The lifecycle of a native salmon is highly dependent upon specific elements of a healthy watershed. For example, sheltered gravel beds and cool, clean water are necessary for fertilized salmon eggs to develop into fry. Plentiful vegetation on the banks helps moderate temperatures and provide habitat for diverse insect life on which juvenile salmon feed. The juvenile salmon then need adequate water flows to migrate downstream to the ocean where they spend from 18 months to five years, depending on the species. Salmon then navigate their way back to the same gravel bed in which they originally hatched, where they spawn and die.

Multiple factors have contributed to declines in watershed health and salmon populations in Oregon. Starting in the mid-1800s, the human population of the Pacific Northwest began growing, coinciding with highly efficient fishing and canning methods that drastically increased salmon harvest rates. Decimation of beavers, introduction of lumber mills and mining, and logging practices are examples of activities that degraded stream habitat.

In addition, since the 1800s, irrigation necessary for farming removed water from rivers and streams. Loss of water flow, coupled with the use of chemical fertilizers and pesticides, degraded water quality. Livestock grazing caused damage to stream banks and vegetation, further lowering water quality in rivers and streams. Dams built on rivers and streams altered the quantity and timing of water flow and sediment transport, and blocked fish passage. Other artificial obstructions in streams and rivers such as weirs and culverts also prevented fish passage.

Fisheries management has historically focused on hatcheries to mitigate loss of salmon habitat, but some studies now indicate that the use of fish hatcheries may accelerate the decline of native salmon. Hatchery produced fish may introduce diseases, compete with naturally spawning fish, and alter genetic diversity through inter-breeding with native fish.

Oregon Watershed Enhancement Board

In 1987 the Governor’s Watershed Enhancement Board (GWEB) was created to provide outreach and aid to private landowners to restore watershed health locally, and to enable the state's natural resource agencies to work together across jurisdictional boundaries. GWEB also encouraged the formation of local partnerships, and several watershed councils were created under its auspices.

The Legislature established the Oregon Watershed Enhancement Board (OWEB) in 1999 to administer Measure 66 funds for natural resource protection and restoration purposes. OWEB’s mission is to help protect and

restore healthy watersheds and natural habitats that support thriving communities and strong economies. OWEB is led by a 17 member policy oversight and decision-making board that represents state and federal natural resource agencies, tribes and the public. It has a staff of 30 employees who administer the agency's grant management, monitoring and reporting programs; develop policy; and perform fiscal oversight responsibilities.

OWEB's restoration and protection efforts are guided by the Oregon Plan for Salmon and Watersheds (Oregon Plan), which began in 1995 as a state-led program for conserving salmon species listed or headed for listing under the federal Endangered Species Act. The initial strategy, called the Oregon Coastal Salmon Restoration Initiative (OCSRI), was focused on recovery of coastal coho salmon and improvement of water quality statewide. In 1997, it became the Oregon Plan for Salmon and Watersheds and has since expanded to address native salmon and steelhead, as well as other native fish in all watersheds of the state.

The Oregon Plan acknowledged that government alone cannot conserve and restore salmon, and that solutions depend on communities and landowners who have local knowledge of problems and ownership in solutions. It also recognized that collective efforts are needed because restoration and conservation activities often cross jurisdictional boundaries and landowner property lines. For example, juniper trees have expanded across large portions of the state. Similarly, salmon travel many miles through streams on public and private lands in multiple cities, counties and watersheds.

As shown below, the funding OWEB has received has increased steadily from about $54 million in the 1999-2001 biennium to $134 million in the 2007-2009 biennium (see Figure 2).

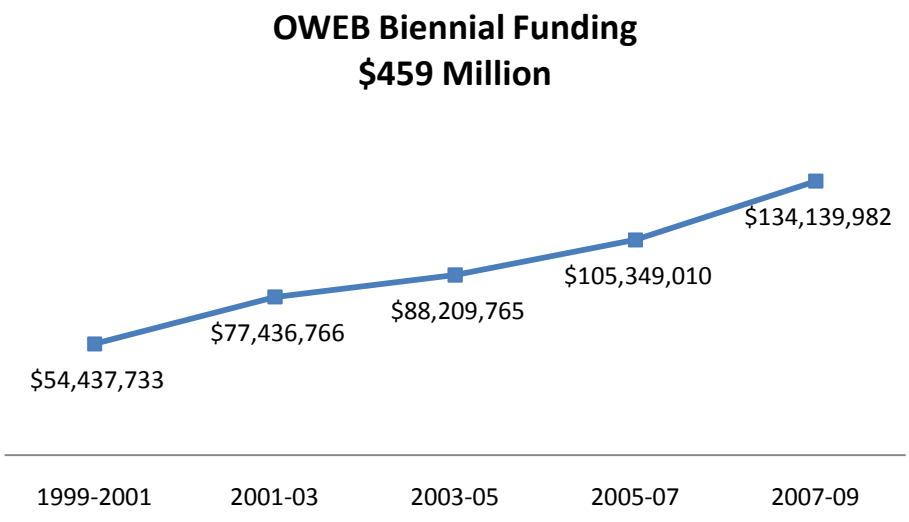

Figure 2: OWEB Funding (7/1/1999 – 6/30/2009)

As of June 2009, OWEB had received a total of about $459 million, including $341 million of lottery funds. However, about 27% of the total funds were allocated by the Legislature to other state agencies. OWEB does not control how these legislatively allocated funds are used.

OWEB also competes regionally for federal Pacific Coastal Salmon Recovery Funds (PCSRF) that are dedicated to salmon habitat restoration, monitoring, planning and education projects to benefit salmon. Since 1999 OWEB has been able to distribute over $93 million of these funds. It has also distributed about $25 million of additional funds such as proceeds from the sale of salmon license plates and the Restoration and Protection Research Fund (see Figure 3).

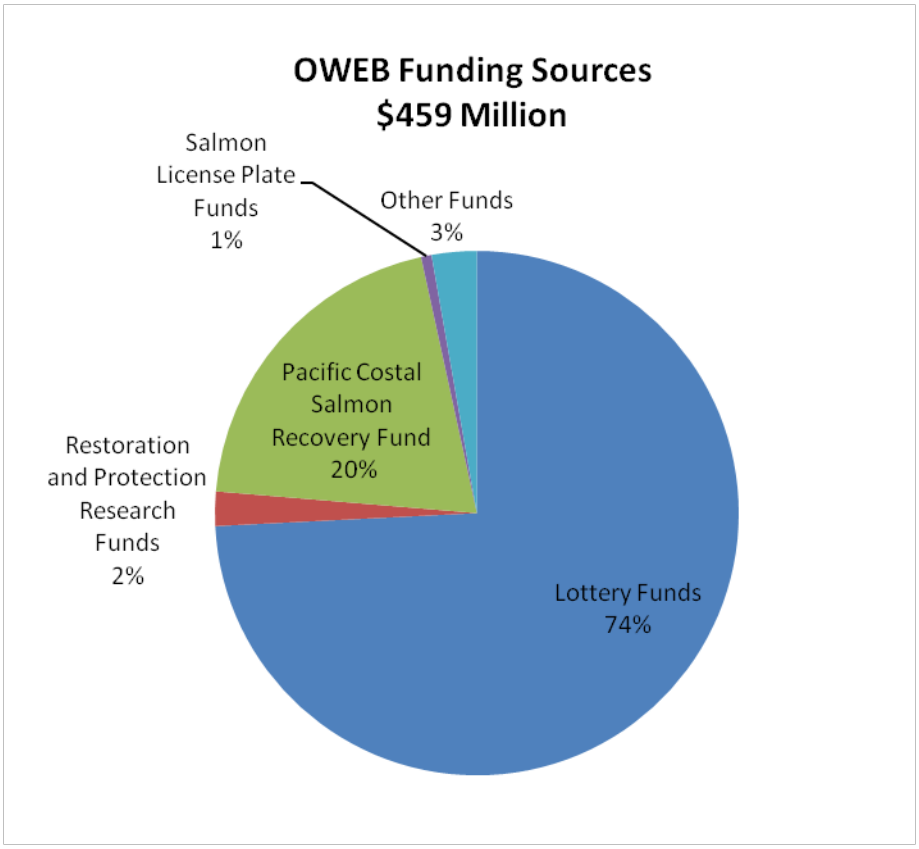

Figure 3: OWEB Funding Sources (7/1/1999 – 6/30/2009)

Audit Results

Our audit found that OWEB has established a sound approach to address the large and complex challenge of watershed restoration and protection in order to produce lasting impacts. It has helped build volunteer watershed communities throughout the state that have performed many restoration activities. It has also developed an adaptive approach to guide these efforts, and partnered with other agencies to leverage resources. While OWEB has made good progress, it should establish statewide watershed restoration priorities, continue to support the establishment of watershed action plans, and renew efforts to develop statewide monitoring.

Watershed Restoration and Protection Activities

Through June 2009, OWEB had helped build capacity and sustainability for local watershed protection and restoration efforts by awarding approximately 4,800 grants totaling about $315 million. These grants funded research, technical assistance, support for local watershed groups, watershed restoration activities and projects, education and outreach, project monitoring and land acquisition. According to OWEB, grants helped restore over 2,600 miles of streams, made more than 3,000 miles of habitat accessible for fish, and helped protect or improve over a half million acres of habitat.

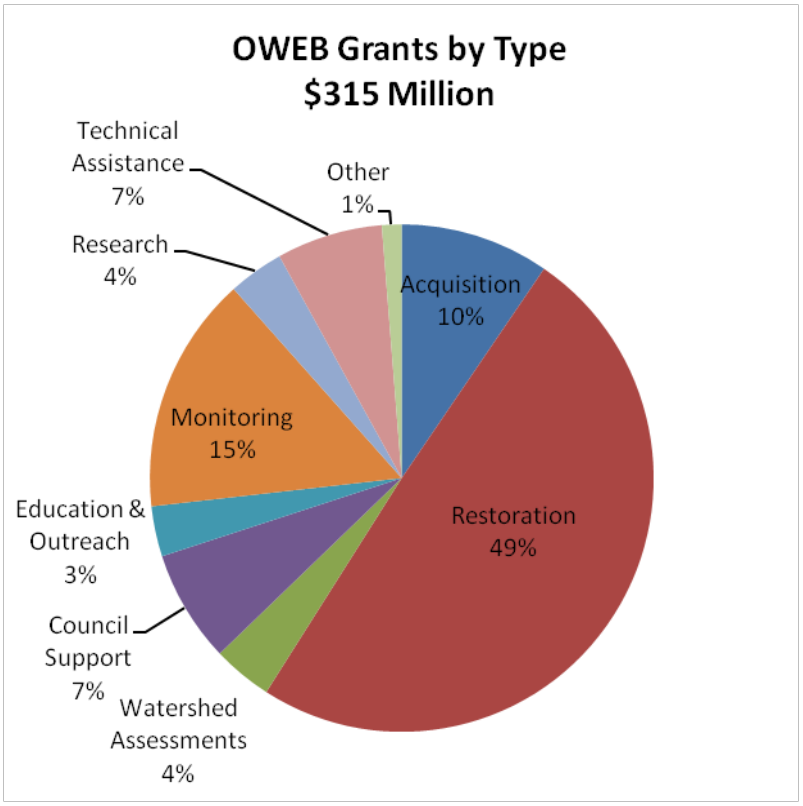

Figure 4: OWEB Grants by Type (7/1/1999 – 6/30/2009)

Grants for restoration projects account for the greatest amount of OWEB funding; followed by monitoring and acquisitions grants (see Figure 4). Watershed restoration activities include riparian planting to promote cooler river temperatures, in-stream work such as large wood placement to create fish habitat, road and culvert work to improve fish passage and reduce sedimentation, and irrigation improvements to restore in-stream flow and improve water quality.

Restoration projects also have added benefits including enhanced water quality, flood control, and education opportunities. According to OWEB, the three largest categories of restoration projects address riparian issues, fish passage and irrigation improvements.

Riparian restoration projects enhance and restore native riparian vegetation, provide erosion control, enhance in-stream flow and stream bed conditions, and provide habitat necessary for salmon spawning.

Fish passage projects re-connect fish to stream habitat that has been made inaccessible through road building activities and other land uses. Culvert replacement or dam removals are examples of fish passage projects. OWEB reported that since the year 2000, barrier improvements or removals have made over 2,000 stream miles accessible to fish.

Irrigation projects strive to create more efficient irrigation systems that improve water quality and leave more water in streams and available for agricultural uses. For example, irrigation efficiencies can be gained by replacing irrigation ditches with piping, which results in less water lost through evaporation or seepage.

Grant applicants are required to state which watershed factors will be addressed by a project and how it will improve water quality or fish and wildlife habitat and follow sound principles of watershed management. OWEB technical review teams evaluate grant applications based on whether or not they demonstrate an understanding of existing limiting factors and their root causes, and document clearly defined objectives for mitigating those limiting factors.

Figure 5: Example of OWEB Culvert Replacement Project

OWEB grants also leverage additional resources for protection and restoration activities by involving community members and landowners. For example, the Scappoose Bay Watershed Council received an OWEB grant to replace a culvert in the Raymond Creek tributary, which was identified as a high priority (see Figure 5).

The project replaced an undersized culvert to improve fish access to habitat, removed invasive species, and replanted the site with native vegetation. Adjacent property owners maintain the culvert site and local high school students continue to conduct water quality monitoring and perform invasive species control. Additionally, the Oregon Department of Fish and Wildlife has conducted fish presence surveys.

OWEB Tools and Resources Guide Restoration Efforts

Oregon's approach is described as one that meshes local watershed-based public support with scientifically sound actions. OWEB's technical support helps restoration groups understand the implications of actions within the watershed, identify watershed issues that need to be addressed, and design and implement appropriate projects. The importance of this technical support was highlighted in a 2009 working paper published by the University of Oregon's Ecosystem Workforce Program, which found that access to technical knowledge resulted in better restoration programs and improvements in watershed conditions.

OWEB provides restoration groups with access to a broad array of technical resources and restoration tools that can be used when planning or implementing restoration projects. For example, OWEB offers detailed manuals for watershed, riparian and estuary assessments. It also provides guides for activities such as riparian planting, dam removal, and technical assistance.

OWEB also manages the Oregon Watershed Restoration Inventory (OWRI), which contains self-reported information on completed watershed enhancement projects across the state. OWRI data can be accessed on-line in various formats and some information is also available through a Restoration Viewer. The Restoration Viewer appears as a map of the state displaying locations, types and details of restoration projects across the state. It was developed as part of the Oregon Explorer Program, a partnership between OWEB, the Institute of Natural Resources, the Oregon Geospatial Enterprise Office and other partners.

The Oregon Explorer is a web-based natural resource library that provides the public and restoration groups with access to natural resource information. Information in the Oregon Explorer is organized according to geographic area, type of data, or specific topic. For example, the Wetlands Explorer provides information about Oregon's wetlands and includes tools to help assess the conditions of wetlands in Oregon. The Oregon Explorer can also access information about wildlife, plants, watersheds, and land-use in specific regions such as the North Coast and Umpqua watersheds.

OWEB also provides an on-line Grant Management System that allows grantees to view past and current grant status and information, such as project location, grant type, award date and amount, and project status.

Successful Efforts to Build Local Support and Capacity

Soil and water conservation districts were originally established in the 1930s as special government districts to foster soil and water conservation on farms and rangelands. In the late 1980s, the Governor's Watershed Enhancement Board began distributing funds to local watershed groups, and in the mid-1990s the Legislature created the Watershed Health Program and authorized the funding of pilot watershed councils in two regions.

Watershed councils and soil and water conservation districts have since become a part of the local infrastructure that OWEB has supported through grants and other assistance. OWEB's 2010 Strategic Plan continues to promote local infrastructure development, greater public involvement and additional partnership development. Additionally, many soil and water conservation districts have become closely connected with watershed councils, and in a number of instances, have acted as a watershed council's fiscal agent.

Oregon has approximately 90 watershed councils and 46 soil and water conservation districts made up of volunteers and staff who work together to improve watershed conditions in their areas. In addition to project specific grants, OWEB provides support grants to watershed councils and soil and water conservation districts. According to OWEB, support grants for the 2009-2011 biennium averaged approximately $100,000 per watershed council, ranging from $37,000 to $129,000. Each soil and water

conservation district received approximately $116,000 for the 2009-2011 biennium.

By providing support grants, OWEB has helped soil and water conservation districts and watershed councils build the capacity to provide education and outreach, and engage landowners and the community in restoration projects. Watershed group representatives told us that stable funding is a persistent issue for restoration work, especially for long-term planning, larger-scale projects, and projects involving long-term monitoring.

The capacity for planning and implementing restoration projects varies among the local groups. Some groups may operate project to project, while others have grown sufficient capacity, with multiple funding streams, that allows for continuity of operations. Some watershed groups have multiple staff and varied funding sources, while others have only one or a part-time staff person, which can affect their ability to plan and implement watershed projects.

Engaging Local Landowners is Critical to Restoration and Protection Efforts

Landowners play a key role in watershed restoration and protection activities. Local watershed coordinators and state agency staff repeatedly emphasized the need for landowner participation. The complex system of regulation and mixed land ownership makes coordination among local, state and federal agencies, as well as private landowners and citizens, critical for restoration and protection efforts.

For example, in 2002 OWEB and the Oregon Department of Fish and Wildlife worked with two private landowners and local watershed groups to improve irrigation systems on 760 acres of land in Southeast Oregon. The goal was to reduce water consumption and improve water quality by decreasing flows of sediment nutrients into the river. The project also dedicated 30 acres of land to wildlife habitat. In 2005, monitoring indicated that the project successfully improved irrigation efficiency and reduced erosion run-off into the Owyhee River system.

Other Partnerships Enhance Restoration and Protection Efforts

When the Oregon Plan was established, advocates of watershed restoration and salmon recovery agreed that state agencies would need to coordinate activities and policies in a way that had not yet been attempted in Oregon. Partnerships are at the heart of both the Oregon Plan and OWEB's efforts, and a multitude of state and federal agencies, as well as other groups, have worked together to improve natural resources in Oregon.

OWEB has partnered with numerous state and federal agencies and other organizations to coordinate efforts, leverage resources and improve opportunities to protect, enhance and restore the state's watersheds. Some of OWEB's partners include:

- Oregon Department of Agriculture
- Oregon Department of Environmental Quality
- Oregon Department of Fish and Wildlife
- Oregon Department of Forestry
- Oregon Department of State Lands
- Oregon Department of Transportation
- Oregon Water Resources Department
- U.S. Bureau of Land Management
- U.S. Bureau of Land Reclamation
- U.S. Department of Agriculture
- U.S. Fish and Wildlife Service
- U.S. Forest Service
- National Marine Fisheries Service

For example, recognizing a need for information, OWEB provided funding to the Oregon Department of Fish and Wildlife for the collection and compilation of data on fish abundance and distribution to better understand the number of fish in the wild and the habitat of each fish species. OWEB also uses this information to monitor Oregon Plan effectiveness through its key performance measures.

OWEB has also recently partnered with the Oregon Department of Environmental Quality and the U.S. Department of Agriculture to facilitate information sharing, data analysis and monitoring of natural resource actions in Oregon. From this partnership, OWEB expects to develop a better understanding of the effectiveness of cumulative funding actions in achieving natural resource outcomes through collaborative monitoring, evaluation and reporting.

OWEB has developed partnerships with tribes across Oregon for protecting and restoring watersheds and other natural resources. For example, the Klamath Tribes have worked with OWEB, private landowners and nonprofit organizations to manage conservation easements, and perform recovery and monitoring efforts. Additionally, the Confederated Tribes of the Warm Springs have been active in OWEB's Deschutes Special Investment Partnership, and in planning and implementing other restoration projects.

Additionally, OWEB partners with Oregon universities and funds scientific research and restoration aids. For example, scientists from Oregon State University make up half of the Independent Multidisciplinary Science Team, an independent panel that advises the state on information needs and science related to the Oregon Plan. OWEB has also invested in the Climate Leadership Initiative at the University of Oregon to support local planning for climate change in the Umatilla, Klamath and Lower Willamette basins.

The protection and enhancement of watersheds also depends on the contributions of local volunteers. According to OWEB, community volunteers spent over 80,000 hours between July 2007 and September 2008 on watershed restoration efforts, including riparian tree planting, river and

stream clean-up, water quality monitoring, and invasive species removal. Many watershed councils implement straightforward restoration projects with volunteers as a means of engaging the community in local watershed restoration.

Volunteer groups help plan and implement restoration projects, perform community education on the importance of watershed restoration, and monitor and assess watershed conditions. However, we also learned that the size and complexity of some restoration work is now beyond the capacity of volunteers, and that skilled contractors are needed.

Natural Resource Partners Assist in Review and Selection of Restoration and Protection Projects

State and federal agencies, as well as other natural resource organizations, collaborate with OWEB by participating on regional teams that review grant proposals submitted to OWEB, and make recommendations to OWEB staff for consideration. OWEB staff then present their recommendations to the Board for funding. Team members also work with individuals and groups, such as watershed councils and soil and water conservation districts, prior to the submission of a grant proposal.

We attended regional review team meetings and observed the many technical considerations of the diverse group of natural resource experts throughout the grant review and selection process. The teams also discussed the merits and limitations of project specifics and ensured that applications reflected an understanding of the larger restoration issues at hand.

Partnerships Target Investments

As OWEB's efforts to help protect and restore watersheds and other natural resources have evolved, so have its strategic funding decisions. In recent years OWEB has specifically recognized partnerships as a targeted budgeting category. OWEB's partnership investments are distinct in that they include specific ecological objectives, define partners' roles and responsibilities, and dedicate significant OWEB matching funds. Additionally, OWEB has focused on building partnerships with private foundations. The following are examples of OWEB'S targeted partnerships.

The Conservation Reserve Enhancement Program (CREP) is a cooperative partnership between OWEB and the U.S. Department of Agriculture, with assistance from the Oregon Departments of Forestry, Agriculture, Water Resources, and Fish and Wildlife. CREP was developed to benefit fish, wildlife and water quality on agricultural lands by addressing problems of decreased stream flows due to farmland irrigation and the loss of riparian forested vegetation. Funding for the program features an 80% federal and 20% state match. According to OWEB, federal investments in the Oregon CREP program through 2009 totaled more than $59 million.

The Whole Watershed Restoration Initiative is a joint project to initiate restoration projects in high-priority basins in Oregon, Washington and Idaho. The goal of the partnership is to identify high-priority watersheds

and complete a focused series of restoration activities within those watersheds that address critical watershed needs. OWEB's partners include the National Marine Fisheries Service, the U.S. Forest Service and Ecotrust, a private organization that administers the program. OWEB receives $2 in federal funds for every $1 that it invests in the program.

In 2007, the Special Investment Partnerships (SIP) was created by OWEB to target long-term, large-scale restoration efforts by multiple stakeholders. They include a specific restoration plan with a prioritized list of projects arranged in a logical sequence to achieve stated outcomes. The result is a coordinated approach to solving large-scale watershed issues. OWEB's Board originally reserved $12 million for the Deschutes and Willamette partnerships in the 2007-2009 biennium, and added $4 million for the Deschutes partnership for the 2009-2011 biennium.

Special Investment Partnerships address explicit ecological outcomes in specific locations through a large project or a group of related projects. For example, the goal of the Deschutes partnership is to contribute to the re-establishment of migrant fish runs and enhance resident fish populations in the main stem and in tributary systems on both the east and west sides of the Deschutes River. In the Willamette SIP, funding partners include organizations such as the Bonneville Environmental Foundation and Myer Memorial Trust, which is a private philanthropic foundation that established a complementary Willamette Initiative.

Changing Circumstances Required OWEB to Alter Monitoring Efforts

Watershed project monitoring activities include documenting original watershed conditions, demonstrating where restoration funds have been spent, communicating whether improved environmental conditions have resulted, measuring benefits to target species and informing decision makers on how best to invest resources in the future. Without adequate monitoring, it is difficult to learn from results, modify efforts to improve program outcomes, or measure and communicate success.

Monitoring at multiple locations, times and detail levels helps capture different environmental responses to restoration work. For example, monitoring high-level indicators such as change in land use or land cover at the basin scale can provide an overview of the status and trends of an entire basin. This information can be combined with more detailed data collection at the project and watershed scales to facilitate a deeper understanding of whether or not restoration actions are achieving desired results.

The monitoring timeframe depends on the goals and design of the monitoring program. Monitoring over a decade or more may be necessary to measure larger environmental system responses to combined restoration activities.

OWEB Leads Oregon Plan Monitoring Efforts

The Oregon Plan states that a comprehensive, multi-disciplinary monitoring program is critical to Oregon's ability to conserve and restore fish populations. Developing standardized and integrated monitoring programs, securing long-term funding commitments, and coordinating with partners is essential to monitoring the impacts of funding decisions and restoration actions.

In 2001, the Legislature passed a bill requiring OWEB to develop and implement a statewide program to monitor activities conducted under the Oregon Plan. Since that time, OWEB has led the efforts to develop and implement a statewide monitoring program.

Originally, OWEB focused on establishing a statewide data coordination and monitoring program by leading its partners in the creation of the Oregon Plan Information System Strategy and Oregon Plan Monitoring Strategy. The goal of the Information System Strategy was to create a state natural resource information system that would support sharing natural resource data for decision making. The Oregon Explorer program previously described was created as a result of the Information System Strategy.

The goal of the Oregon Plan Monitoring Strategy was to create a framework to evaluate the effectiveness of the Oregon Plan and guide the development and implementation of credible and efficient ways to monitor the status of watershed conditions and fish populations. In 2005, OWEB commissioned the Institute for Natural Resources to identify high-level environmental indicators that could be used to measure trends in environmental conditions. The Institute, together with technical staff from Oregon Plan partner agencies, identified 15 high-level environmental indicators, and then proposed a statewide approach to monitor four high priority indicators.

At the same time that OWEB was working to implement statewide monitoring efforts, competing priorities caused other state agencies to reduce their capacity for monitoring, and a more recent funding request to monitor the high-level environmental indicators was not approved. As a result, systematic monitoring and reporting on environmental indicators has not occurred.

OWEB's Monitoring Efforts Have Evolved

Despite the issues noted above, OWEB developed and implemented its own Effectiveness Monitoring Program, and continued to coordinate and fund statewide monitoring efforts with other natural resource agencies and organizations. Effectiveness monitoring evaluates the result of a restoration project, or a suite of restoration projects, over a longer term in an attempt to determine if the project(s) had the desired impact on environmental conditions. Effectiveness monitoring is meant to help OWEB draw conclusions about restoration efforts and adapt its investments accordingly.

Project-level effectiveness monitoring measures environmental parameters to determine if restoration actions were effective in creating desired changes in habitat conditions. OWEB has funded project-level effectiveness monitoring for juniper removal, small dam removal, fish passage improvements, irrigation efficiency improvements, exclusion of livestock from riparian areas, and other projects. Based on information obtained from project-level effectiveness monitoring, OWEB also published field guides to juniper removal and livestock exclusion.

OWEB also offers individual monitoring grants that may be used for gathering baseline data on current conditions, evaluating the specific effects of management actions, or for comparing similar watershed components before and after a project. For example, in partnership with the U.S. Forest Service, OWEB funded the Mid-Coast Watershed Council to perform three years of monitoring for a restoration project that placed 29 large trees into the Green River. The goal of the restoration project was to increase the quantity of winter and summer salmon rearing habitat by adding large trees to trap leaves and small wood and improve habitat complexity.

Monitoring reports noted that the wood jams were creating excellent habitat and stream complexity, and that steelhead trout spawning beds and juvenile coho salmon were observed underneath large wood jams. In addition, preliminary results from other large wood placement projects in the Green River demonstrated a doubling of coho salmon winter rearing production (see Figure 6).

Additionally, all of OWEB's competitive restoration grants require an end-of-project report to ensure that work was completed successfully and any important lessons learned are transmitted.

Limitations on funding, however, have framed the extent of OWEB's monitoring efforts each biennium. Until recently, 35% was the only eligible portion of Measure 66 lottery funds dedicated to natural resource protection and restoration that could be used for non-capital expenditures, including watershed restoration monitoring.

Figure 6: Green River Large Wood Placement Project

OWEB Continues to Promote Statewide Monitoring Efforts

OWEB has attempted to fill some of the need for long-term, multi-scale monitoring through partnerships with other organizations. For example, OWEB has leveraged funds for targeted, long-term monitoring of restoration projects in the Deschutes and Willamette basins. It has also partnered with tribes, state and federal agencies, and private organizations on Intensively Monitored Watersheds to determine the combined effects of all restoration projects in a watershed. Within these partnerships, OWEB funding for restoration projects complements that of other sources for monitoring and planning.

For example, OWEB has partnered with several organizations for restoration actions on the John Day River, including tributaries and upland areas. In 2004, a working group formed to coordinate restoration and monitoring projects in the basin. Projects have replaced dams and culverts that impeded fish passage, improved irrigation systems, removed excessive juniper growth, replanted riparian areas and resulted in other restoration activities.

The collective impact of these projects is now being monitored as a part of the Upper Middle Fork John Day Intensively Monitored Watershed. The monitoring effort began in 2008, and according to OWEB, fiber-optic cable stream temperature monitoring has already shown links between placement of logs in streams and cooler water temperatures in some areas.

OWEB has also continued to partner with other organizations to develop and track indicators of environmental condition. For example, one such indicator is the abundance and distribution of fish across the state. OWEB,

along with the Oregon Geospatial Enterprise Office and other organizations, funded an ongoing Oregon Department of Fish and Wildlife project to compile different natural resource agency datasets on the circulation of fish species and the locations of fish passage barriers across the state. This information, once combined, can be used to track fish distribution and target high-priority fish passage barriers for removal.

Additionally, OWEB funded the development of a web-based interactive tool called the Fish Passage Viewer, which provides a visual image of the streams and rivers in the John Day and Coos basins that have been opened up for fish passage as a result of barrier removals.

More Cooperation in Monitoring Is Needed

In Oregon, natural resource data is collected by multiple state, local, federal, and nonprofit agencies. However, it is frequently collected at discontinuous locations and scales to meet the needs only of the agency collecting the data. Oregon's Independent Multidisciplinary Science Team has repeatedly expressed concern about the lack of standardized data, most recently stating, "There is still a significant need in Oregon for various monitoring groups to collect standardized data that can be integrated into larger analysis."

While data sharing across agencies would facilitate the work of natural resource managers and policy makers, including salmon recovery and watershed management, it is currently difficult to aggregate data across jurisdictions that use different monitoring and data collection methods.

OWEB Adaptively Managed Restoration and Protection Efforts

The Oregon Plan states that watershed restoration efforts will need to adapt, evolve and improve based on information obtained from monitoring, independent scientific review and the knowledge of the people putting the Oregon Plan to work. Our audit found that OWEB has applied adaptive management strategies including learning from experience, applying alternative approaches, and making changes to current programs.

OWEB's efforts to protect and restore watersheds and other natural resources have evolved considerably since its establishment in 1999. It has also applied adaptive measures to address issues impacting local restoration efforts. For example, OWEB identified a need to be responsive to smaller, straightforward restoration projects, and in 2002 created the Small Grant Program which funds restoration projects of $10,000 or less. According to OWEB, as of September 2009, approximately 1,500 projects had been funded through the Small Grant Program.

We noted many other instances of OWEB evaluating the effectiveness of its programs and policies, discussing approaches and adapting programs based on lessons learned. For example, OWEB has modified its reporting requirements for riparian planting grants based on knowledge gained from

previous projects. It also continues to improve its competitive grants program through practices that have increased accountability.

OWEB also regularly seeks input from Oregon Plan partners, including other natural resource agencies, watershed councils and other groups. For example, in February and March 2010, OWEB met with watershed councils around the state to gather input on how it might improve watershed council support processes in order to build greater capacity, provide base funding and promote strategic partnerships.

On a larger strategic scale, OWEB modified its approach to increase effectiveness, which resulted in investments in large-scale strategic restoration efforts such as the Special Investment Partnerships, the Conservation Reserve Enhancement Program, the Intensively Monitored Watersheds, and the Whole Watershed Restoration Initiative. Additionally, OWEB's alteration of its efforts to achieve its own monitoring goals, while continuing to pursue statewide monitoring efforts is further evidence of OWEB adapting in response to current circumstances.

Time to Establish Statewide Watershed Priorities and Local Action Plans

As previously described, OWEB has funded projects to restore watersheds, while also building local capacity. OWEB encouraged proposals from watershed councils and others, which often matched priority restoration needs in the watershed. While this strategy produced many watershed improvements, the projects were not considered within the context of defined statewide priorities. Clear statewide priorities would encourage more specific action plans from local groups.

Statute requires that OWEB establish statewide and regional goals and priorities that become the basis for Board funding decisions, and that in adopting such goals, the Board also adopt priorities for grant funding. OWEB has stated that its investments seek to address critical factors limiting the function of watersheds by focusing on the water quality and quantity of rivers and streams.

Although OWEB has helped local groups identify regional restoration priorities and has recognized priority basins, it has not yet developed its own set of specific, statewide restoration priorities on which to base its short and long-term funding decisions. Currently, OWEB selects and funds its competitive restoration and protection grants from those presented to it through the regular granting process. The selections are not based on a long-term statewide restoration plan.

Statute also directs OWEB to establish a framework for a locally based watershed planning and management process that includes guidance for watershed assessments and preparation of watershed action plans. Watershed assessments document existing conditions and limiting factors in a watershed, including natural processes, human activities and land uses within the watershed.

An action plan allows a group to focus its efforts, identify the tasks required to achieve desired results, and prioritize projects. Since there is no single model that would work for all watersheds or watershed councils, action plans should differ for each watershed. Without an action plan, groups may lack focus and actions may not address desired outcomes for the watershed.

Although OWEB has worked closely with watershed councils and other groups to assess watershed conditions and identify limiting factors, some of Oregon's watershed basins lack action plans that address limiting factors and guide local restoration planning and regional funding decisions. To date, OWEB has not established guidelines for developing restoration action plans. Additionally, watershed representatives told us that project funding requests are often brought to OWEB as opportunities emerge, not as part of an overall restoration plan.

With an increased understanding of watershed needs, limitations, and restoration activities, OWEB is now better prepared to develop statewide priorities that inform its future activities. In addition, guidance and expectations for local action plans would allow statewide watershed needs to be more systematically addressed.

Recommendations

Recently, Oregonians approved Ballot Measure 76, which continues the constitutional dedication of lottery proceeds for parks, beaches, wildlife habitat, and watershed protection beyond 2014.

As OWEB moves forward and builds on its successful efforts, we recommend it apply the following strategies:

- develop guidance for, and continue to support, the establishment of watershed action plans that address local protection and restoration objectives;
- develop statewide restoration priorities that establish clear, technically defensible, and practicable recovery and restoration objectives on which to base future funding decisions; and,
- continue to work with natural resource agencies and other partners to implement a statewide monitoring plan.

Objectives, Scope and Methodology

The purpose of our audit was to review OWEB's efforts to help protect and restore watersheds and other natural resources. We focused on OWEB's efforts to build capacity and sustainability for local restoration work, develop partnerships, monitor, and apply adaptive management practices.

To accomplish our objective, we reviewed numerous documents related to OWEB and restoration and protection activities such as the Oregon Plan for Salmon and Watersheds, OWEB's strategic plan, OWEB's performance measures, OWEB's Oregon Plan Biennial Reports, other reports, and technical guides and publications. We also reviewed applicable laws and regulations.

We reviewed OWEB Board meeting minutes and associated staff memos. We reviewed the Oregon Plan Information System Strategy, the Oregon Plan Monitoring Strategy, and information on watershed health and environmental indicators. We reviewed natural resource data and tracking systems available to the public on OWEB's website. We also reviewed watershed restoration and protection studies, work papers and journal articles.

We spoke with program staff and management from OWEB and other state natural resource agencies, university staff, representatives from watershed councils, a representative from a soil and water conservation district, tribes, and other natural resource experts. We also spoke with current and former OWEB Board members.

We reviewed OWEB's grant application, review and awarding practices, as well as documentation contained in grant files. We reviewed interagency agreements and memorandums of understanding. We toured restoration sites with OWEB staff and attended regional review team grant selection meetings. We also reviewed local watershed assessments and restoration priorities, and action plans.

We reviewed OWEB's funding and distributions since 1999 and compared the information to that previously audited by our office. We also compared funding distribution information to award data contained in OWEB's Grant Management System to verify the reliability of fund distributions.

We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient and appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Oregon
John Kitzhaber, MD, Governor

Oregon Watershed Enhancement Board
775 Summer St NE Ste 360
Salem, OR 97301-1290
(503) 986-0178
FAX (503) 986-0199
www.oregon.gov/OWEB

OWEB

January 26, 2011

Gary Blackmer, Director
Audits Division
Office of the Secretary of State
255 Capitol Street NE, Suite 500
Salem, OR 97310

Dear Mr. Blackmer:

The Oregon Watershed Enhancement Board (OWEB) wishes to thank the Secretary of State's Office for the opportunity to comment on the agency's performance audit report. Overall, I want to express my appreciation for the depth, accuracy and completeness of the report. This is particularly notable given the audit's broad scope and ten-year period of focus. I also want to commend your staff for the professionalism they demonstrated throughout the audit process.

OWEB concurs with the three audit report recommendations. Our responses to each are contained below.

Recommendation 1: Develop guidance for, and continue to support, the establishment of watershed action plans that address local protection and restoration objectives.

OWEB agrees with the recommendation. Action plans established at the local watershed level are the cornerstone to establishing a strategic approach to planning and implementing watershed protection and restoration projects across the state. Action plans serve to both incorporate current data and strategically focus future protection and restoration priorities. Some watershed action plans are older while others have been updated. It is important to note that many older action plans are still relevant.

OWEB recognizes the ongoing need to update action plans where warranted. It will be important to incorporate the recently established and standardized Oregon Plan for Salmon and Watersheds (Oregon Plan) regional restoration priorities, new information and experiences under a changing climate to ensure that action plans are current and relevant over the long term. The combination of making needed updates to action plans and maintaining a robust infrastructure of watershed councils and soil and water conservation districts is a fundamental aspect of delivering a successful watershed restoration program.

OWEB recognizes the need to maintain up-to-date watershed action plans. At this time, it is not clear how the recent passage of Ballot Measure 76 and its direct connection to OWEB's program might influence agency program priorities. Over the coming year, OWEB will discuss the

priorities and timing of all aspects of the grant program with our Board. This discussion will include the issue raised by this recommendation.

Recommendation 2: Develop statewide restoration priorities that establish clear, technically defensible, and practicable recovery and restoration objectives on which to base future funding decisions.

OWEB agrees with the recommendation. As noted above, regional restoration priorities have been completed in all areas of the state in the past year. As called for in the agency's strategic plan, the incorporation of restoration priorities at the local and statewide levels allows for a strategic approach for investment in Oregon's watersheds.

With the broad mix of natural resource management issues and the complexity of other agency programs related to OWEB's authorities, OWEB included an action within its strategic plan that calls for alignment of OWEB's restoration priorities with certain other conservation-related plans. Specifically, the incorporation of the Oregon Department of Fish and Wildlife's (ODFW) Comprehensive Wildlife Conservation Strategy and the Department of Environmental Quality's (DEQ) Total Maximum Daily Load plans into OWEB's priorities has been identified as a significant and important early priority action. Likewise, recovery plans for species listed under the state and federal Endangered Species Acts often describe priority actions. Ultimately, OWEB's goal is to better connect our priorities with the prioritization work of other agencies. This work will inform and guide the development of statewide priorities.

As with the previous recommendation, due to the uncertainty around the implementation of Measure 76, it is difficult to establish a definitive timeframe for acting on this recommendation. OWEB will include the recommendation as an item for discussion as we develop our priorities and plans for next biennium.

Recommendation 3: Continue to work with natural resource agencies and other partners to implement a statewide monitoring plan.

The agency agrees with the recommendation. OWEB is charged in statute with not only managing its own grant program but also to serve as a convener, facilitator and funder of coordinated natural resource monitoring efforts that support the Oregon Plan. Additionally, OWEB is required to provide a means to track and report on the accomplishments of its grant program activities as well as larger scale Oregon Plan statewide issues. This work occurs in part through the agency's Key Performance Measures, the Oregon Plan Biennial Report and the OWEB web site.

The monitoring information that is necessary to report to the Legislature, Governor's Office and the public in general is attained in large part through the monitoring efforts of the Oregon natural resource agencies and OWEB's grant recipients. While the capacity of many of the

state's monitoring efforts has diminished over the past ten years, OWEB plans to continue working with other agencies and other partners in building a statewide strategy for monitoring. In the near term, the strategy may be reduced in scope from the concepts developed in the early to mid-2000's due to budgetary and staffing capacity constraints.

OWEB plans to meet with the Oregon natural resource agencies to develop the near and long term proposals for coordinated monitoring in the spring of 2011. OWEB has also begun working with these same agencies to develop a response to the 2010 Independent Multi-disciplinary Science Team letter recommending more and better coordinated monitoring in the State of Oregon. The agency expects to complete the response in the spring of 2011.

In summary, OWEB is committed to working on the recommendations raised in the performance audit report. We look forward to working with the Secretary of State's office in the future to assess our efforts to make progress on implementing the recommendations.

Sincerely,

Thomas M. Byler
Executive Director

About the Secretary of State Audits Division

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Audit Team
William Garber, CGFM, MPA, Deputy Director
James Scott, MM, Audit Manager
Sheronne Blasi, MPA, Principal Auditor
Amelia Eveland, MBA, Senior Auditor
Anna Plumb, MPP, Staff Auditor

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mail: Oregon Audits Division
255 Capitol Street NE, Suite 500
Salem, OR 97310

The courtesies and cooperation extended by officials and employees of the Oregon Watershed Enhancement Board during the course of this audit were commendable and sincerely appreciated.