Oregon Plan for Salmon and Watershed
Oregon Coast Coho Assessment
Wetlands, Estuaries
Dredge, Fill and Inwater Construction
Prepared by Department of State Lands

Introduction

The Oregon Department of State Lands (DSL or Department) and the U.S. Army Corps of Engineers, Portland District (Corps) administer similar programs to regulate fill and removal in waters of the State of Oregon. DSL's jurisdiction includes, but is not limited to, rivers, intermittent and perennial streams, lakes, ponds, wetlands, estuaries and tidal bays (to the elevation of the highest measured tide) and the Pacific Ocean (from the line of extreme low tide seaward to the limits of the territorial sea). The Department regulates removal-fill activities under both the Removal-Fill Law (Oregon Revised Statutes (ORS) 196.800 - 196.990 and the State Scenic Waterway Law (ORS 390.805 to 390.925). The Corps regulates activities under Section 404 of the Clean Water Act (33 U.S.C. 1344) and Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403), as amended.

These state and federal laws were enacted to protect the public values associated with waterways and wetlands, values like fish habitat, navigation, waterfowl habitat, flood control and water quality. Under both the federal and state programs, a permit may be required for fill or excavation in waterways and wetlands. The state Removal-Fill Law contains a volume threshold of 50 cubic yards except in designated Essential Indigenous Anadromous Salmonid Habitat Areas (ESH), but there is no volume threshold in State Scenic Waterways (ORS 390.805 to 390.925).

Policy for Evaluation of Conservation Efforts when making Listing Decisions (PECE)

In determining how to consider a formalized conservation effort when evaluating whether to list a species, we must evaluate whether the conservation effort addresses one or more threats to the species. Two factors are key in that evaluation:

A. The certainty that the conservation effort will be implemented.

1. The conservation effort, the party(ies) to the agreement or plan that will implement the effort, and the staffing, funding level, funding source, and other resources necessary to implement the effort are identified

2. The legal authority of the party(ies) to the agreement or plan to implement the formalized conservation effort, and the commitment to proceed with the conservation effort are described.
3. The legal procedural requirements (e.g. environmental review) necessary to implement the effort are described, and information is provided indicating that fulfillment of these requirements does not preclude commitment to the effort.
4. Authorizations (e.g., permits, landowner permission) necessary to implement the conservation effort are identified, and a high level of certainty is provided that the party(ies) to the agreement or plan that will implement the effort will obtain these authorizations.
5. The type and level of voluntary participation necessary to implement the conservation effort is identified, and a high level of certainty is provided that the party(ies) will implement the conservation effort will obtain that level of voluntary participation.
6. Regulatory mechanisms (e.g., laws, regulations, ordinances) necessary to implement the conservation effort are in place.
7. A high level of certainty is provided that the party(ies) to the agreement or plan that will implement the conservation effort will obtain the necessary funding.
8. An implementation schedule (including incremental completion dates) for the conservation effort is provided.
9. The conservation agreement or plan is approved by all parties to the agreement or plan.

B. The certainty that the conservation effort will be effective.

1. The nature and extent of threats being addressed by the conservation effort are described, and how the conservation effort reduces the threats is described.
2. Explicit incremental objectives for the conservation effort and dates for achieving them are stated.
3. The steps necessary to implement the conservation effort are identified in detail.
4. Quantifiable, scientifically valid parameters that will demonstrate achievement of objectives, and standards for these parameters by which progress will be measured, are identified.
5. Provisions for monitoring and reporting progress on implementation (based on compliance with the implementation schedule) and effectiveness (based on evaluation of quantifiable parameters) of the conservation effort are provided.
6. Principles of adaptive management are incorporated.

A.1. Stable Staffing and Funding Levels; Dedicated Funding Source

Summary

The state's regulatory program has been in effect since 1967. The budget has steadily increased to approximately $2.65 million per fiscal year. The scope of authority has broadened from regulating removal of material in streambeds (1967) to also regulating fill and removal (1971). Law further defined DSL's wetland jurisdiction in 1989. DSL funds the removal-fill program with permit fees and revenues derived from certain types of state owned lands managed by the Department. This revenue source has

proven over time to be a stable and not as vulnerable to changing economic conditions, as is the state general fund.

The department manages the beds and banks of state-owned navigable waterways, including the Territorial Sea, throughout the State. An aspect of management includes authorizing uses and improvements to these waterways including 413 leases (e.g. marinas), 309 easements (e.g. bridges, fiber optic cables), 1,452 registrations (small non-commercial docks) and 206 licenses for public facilities, such as boat ramps, and 24 licenses for commercial sand and gravel extraction. Over $2,098,425 annually is produced by these transactions. These lands are managed under the rules of the State Land Board. Fees are established under the Board's rules and the department administers and enforces all contracts and agreements. Fees are periodically adjusted to maintain fair market value compensation for the use of the state's waterways. The principle management objectives are found in the Oregon Constitution (Article VIII section 5) and the Public Trust Doctrine. Uses are authorized where they avoid unreasonable interference with public navigation, fisheries and commerce.

Public ownership of the reaches of all of Oregon's tidally influenced waterways is a well-settled matter (Phillips Petroleum Co. v. Mississippi, 484 US 469, 476, 108 S Ct 791, 98 L Ed2d 877 (1988)). The ownership of tidelands (i.e. the area between high and low tide) is also well settled. Many tideland acres are in private ownership but Oregon maintains some public rights over these lands under the *jus publicum* aspect of the Public Trust Doctrine. However, the nature and extent of these rights is subject to legal interpretation. The public ownership claim to the non-tidally influenced reaches of many of Oregon's coastal streams is still an open legal question. Nonetheless, the jurisdiction of Oregon's removal-fill law extends to all waters of the state whether publicly owned or not.

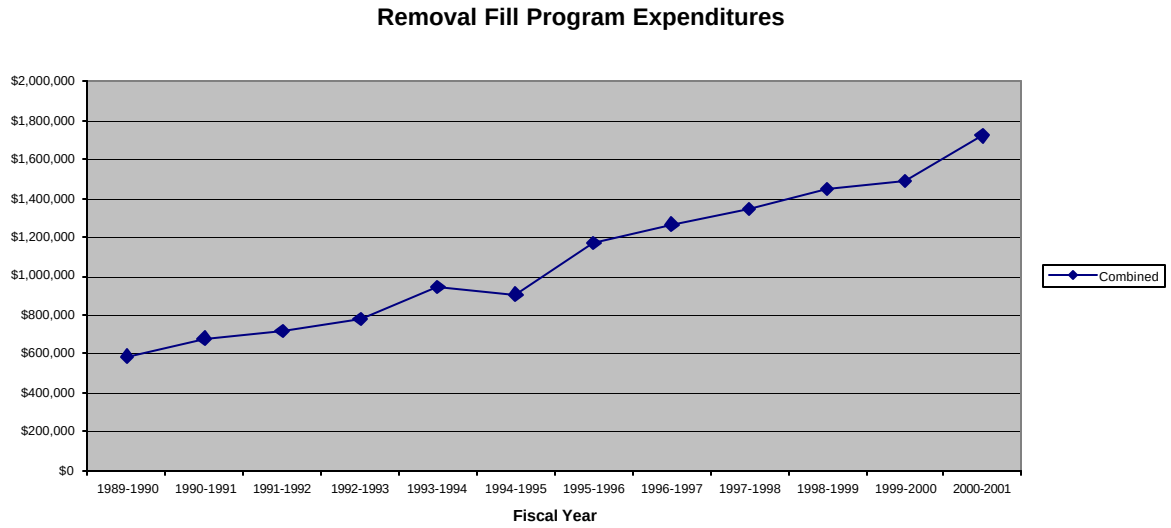
Currently there are 2,404 uses (detailed above) authorized on state-owned waterways in Oregon; about 1,523 of these are within Clatsop, Coos, Douglas, Lane, Lincoln and Tillamook Counties. Only four of the twenty four commercial sand and gravel licenses are in these counties, they are on the Siuslaw, Yaquina; Umpqua; and Columbia Rivers. The Columbia River site is not in the ESU. Many of the structures and uses under authorization by the department have existed along state-owned waterway lands for decades. Uses of coastal waterfront have changed markedly. While in past years log raft leases covered several hundred acres of water surface, over the past ten years there has been a sharp reduction in this use. In addition 'working' waterfronts (e.g. canneries, commercial fishing boat moorages) have given way to other types of waterfront developments that have re-used and redeveloped the older buildings.

Discussion

Oregon's regulatory program was initiated in 1967 by the legislature as a statute regulating the removal of material from riverbeds to protect anadromous fish. That law was transformed into the Removal-Fill Law in 1971, expanding the state's authority to regulate filling in estuaries as well. The statutes were revised again in 1979 to require mitigation for estuarine fills. Then, in 1989, the state passed Senate Bill 3, a comprehensive wetland conservation bill developed by consensus and passed unanimously by both

houses. The bill addressed mounting concerns over the delays and inequities between state and federal regulatory programs, conflicts between those programs and local comprehensive plans, and the lack of protection afforded to Oregon's remaining wetland resources by either regulation or planning. The bill also created a wetland conservation program within DSL. In 1993, the Essential Indigenous Anadromous Salmonid Habitat (ESH) designation process was added to the Removal-Fill Law, eliminating the blanket 50 cubic yard exemption in most salmon-bearing streams. ESH maps can be accessed on the DSL website at: http://www.oregonstatelands.us/esshabitat.htm.

The table below illustrates the trend in funding for the Removal-Fill program from the Fiscal Year (FY) 89-90 to FY 00-01. During this time the budget increased from $600,000 to approximately $1.7 million. The legislatively approved budget for the 2003-2005 biennium was $4,135,543.



The removal-fill program is staffed by a combined total of 29.5 positions located in two Divisions. The headquarters office is in Salem, with one regional office in Bend. The removal-fill law in ORS 196.800 to 990 applies to fill or removal of certain waters of the state, including wetlands. Program personnel review all permit applications, coordinate responses received from resource agencies, public interest groups, private citizens, and other members of the public, issue permits, investigate violations, enforce permit conditions, review wetland delineation reports, carry out wetland planning and conduct rulemaking.

Twelve Resource Coordinators process permit applications, conduct compliance monitoring and carry out enforcement. Currently no personnel are dedicated to enforcement, but DSL is addressing this by applying for a grant of the U.S. Environmental Protection Agency (EPA) to help fund dedicated compliance monitoring and enforcement staff. DSL will never achieve 100% compliance, but that is our goal. We believe that management procedures we have recently put in place, such as the adoption of a Compliance Manual, will significantly improve our track record.

Eight Resource Coordinators are assigned to Western Oregon, two in Eastern Oregon, and two are dedicated to review ODOT projects statewide. Directly supporting and working collaboratively with these positions is a compensatory mitigation specialist, 3.0 wetland specialists, 1.0 statewide policy analyst, 7.5 support positions and 5.0 program managers. During fiscal years 2002-2004, the Resource Coordinators issued approximately 2,500 authorizations, reviewed approximately 690 complaints, resolved 278 violations and monitored approximately 200 compensatory wetland mitigation sites for compliance with permit conditions. More specifics on the permitting and monitoring program are provided under "Compliance Monitoring and Enforcement," and other sections that follow in this report.

The removal-fill program also includes the statewide wetlands inventory (ORS 196.672(3) and 196.674); wetland conservation plans (ORS 196.672 and 196.686); wetland land use notification (ORS 196.672(1), (3) and (6)); public information program (ORS 196.688); and program development, including wetland determinations. The statewide wetlands inventory (SWI) is based upon the National Wetlands Inventory (NWI) developed by the U.S. Fish and Wildlife Service and is augmented in urban areas by Local Wetlands Inventories (LWI) that provide much more detailed and complete inventory information suitable for both planning and regulatory purposes. LWIs are conducted by wetland consultants contracted by local governments or by the Department, using standards adopted in rule by the Department in 1991. All LWIs are subject to review and approval by the Department before they become part of the SWI and can be used for wetland planning by the local government. Most LWIs also include a riparian habitat inventory. Since adoption of the LWI rules, the Department has approved sixty-three LWIs.

All counties and cities are required by law to notify DSL (i.e., wetland land use notification) of certain development activities proposed in areas mapped as wetland on either the National Wetlands Inventory (NWI) or, if completed, the Local Wetlands Inventory (LWI). DSL reviews the materials, contacts the applicant for more information and to make a site visit, if needed, and determines if a wetland delineation and/or permit is required prior to site development. The written response goes to the applicant and the relevant local government. The objective is to provide early coordination between local (city or county) development approvals and state wetland/waterway regulations.

One Wetland Conservation Plan (WCP) has been approved by DSL—the West Eugene Wetlands Plan (WEWP) was approved in 1994. Department staff continues to serve on the Technical Advisory Committee and on the Mitigation Bank Review Team (a mitigation bank program is one component of the WEWP). The WEWP has become a nationally recognized model for locally based wetland planning.

A.2. Legal Authority to Implement the Program; State's On-Going Commitment to the Program

Summary

The State Land Board, consisting of the Governor, the State Treasurer and Secretary of State, remain committed to the removal-fill program. The Governor's 2005-2007 Budget for the agency sets the following priorities:

- Creating revenue for the Common School Fund;
- Supporting the ODOT Bridge Program and Economic Revitalization;
- Continuing to support the Removal-Fill program; and continuing to support South Slough.

These priorities are aligned with the Governor's priorities for children, a positive business climate and economic development, a balance between growth, infrastructure and the environment, and a stable, responsive and accountable government.

In addition, the agency is reorganizing its functions in order to reflect the Department's priorities contained in its *2004-2008 Strategic Plan*.

Upon legislative approval of the agency's 2005-2007 budget, DSL's programs will be allocated among three Divisions. The likely effective date of the changes would be July 1, 2005. This timing will allow DSL to align the next budget and approved program option packages with the new structure—starting all simultaneously. The new Divisions are described below.

- Land Management Division: the new Division will focus on statewide land and waterway leasing and management.
- Wetlands & Waterways Conservation Division: the new Division will unite the current Wetlands and Removal-Fill Permit programs.
- Finance & Administration Division: including the Fiscal Services Section, a lease compliance auditor, the Estates Unit, Information Systems Section and agency-wide rule coordination responsibilities.

The move will strengthen all three Divisions in their respective roles. The new configuration brings greater clarity of roles and improved coordination within program areas.

Discussion

Department of State Lands 2005-07 Governor's Recommended Budget—Relevant Highlights

Mission: *To ensure a legacy for Oregonians and their public schools through sound stewardship of lands, wetlands, waterways, unclaimed property, estates and the Common School Fund.*

Relevant Major Initiatives:

Continue Support for Statewide Bridge Repair/Economic Revitalization

- Continues the work of one staff as part of the Economic Revitalization Team efforts to certify industrial lands and resolve economic development issues
- Continues the work of two staff focused on the ODOT statewide bridge repair program

Removal-Fill Program Improvements

- Enhance Wetland Delineation Customer Service by reducing processing times through the addition of a position, contingent upon passage of fees.
- Wetland Mitigation Bank higher activity level in support of HB 2899, passed during the 2003 Legislative Session, allows more flexibility and options for applicants
- Increase use of information systems

Support for South Slough National Estaurine Research Reserve, Education and Land Management Efforts

- Continue current federally funded positions that support research, education, and facility maintenance
- Boost fiscal accountability through upgrading a management position and adding a fiscal support staff
- Enhance information systems and data processing through addition of limited duration staff.

A.3. Legal Procedural Requirements

DSL has the legal authority to fully implement the removal-fill program under the sole authority of the Director. Oregon does not have a state environmental review law that constrains the agency's ability to regulate removal or fill activities.

A.4. Authorizations Necessary for Implementation

Summary

The agency has the necessary legal authority to enter private or public property, at reasonable times, to implement, enforce and administer the removal-fill program.

Discussion

In considering applications for permits, ORS 196.845 provides the authority for agency personnel to investigate and conduct surveys. Normally, permit applicants grant DSL permission to enter their property when necessary so that the staff may become familiar with site conditions.

> ***196.845 Investigations and surveys.*** *In considering applications for permits, the Director of the Department of State Lands may cause investigations or surveys to be made of the location of the work contemplated to determine whether such removal or filling is consistent with ORS 196.805 and 196.825.*

ORS 196.860 identifies the Department's authority to investigate circumstances related to removal or filling that may be contrary to permit conditions, or that may be occurring without a permit.

> ***196.860 Enforcement powers of director****. (1) If the Director of the Department of State Lands determines that material is being removed from or filling is occurring in any of the waters of this state without a permit issued under ORS 196.825, or in a manner contrary to the conditions set out in the permit, or in a manner contrary to the conditions set out in an order approving a wetlands conservation plan, the director may:*
>
> *(a) Investigate, hold hearings, make orders and take action, as provided in ORS 196.600 to 196.905, as soon as possible.*
>
> *(b) For the purpose of investigating conditions relating to such removal or filling, through the employees or the duly authorized representatives of the Department of State Lands, enter at reasonable times upon any private or public property…*

A.5. Voluntary Participation Necessary to Implement the Program

Unless specifically exempted or waived under ORS 196.800 – 196.990, no person or governmental body may remove any material from the beds or banks or fill any waters of the state without a permit (196.810). DSL's program contains non-mandatory wetland conservation elements designed to enhance resource protection. For example, wetland inventories promote greater awareness of the location and functions of local wetlands, and may increase compliance with state law, but LWIs are not mandatory.

A.6. Regulatory Mechanisms

Summary

DSL derives its authority for the removal-fill program from state law, as enacted by the Oregon Legislature. Oregon's removal-fill program is independent from the federal Section 404 Clean Water Act/Section 10 Rivers and Harbors Act regulatory programs. As such, Oregon's regulatory jurisdiction for its removal-fill law turns on state law rather than federal. Federal court interpretations of the Clean

Water Act, such as the U.S. Supreme Court case that led the federal government to exempt so-called *isolated wetlands*, do not affect Oregon's authority to regulate removal and fill activities (*Solid Waste Agency of Northern Cook County (**SWANCC**) v. United States Army Corps of Engineers)*. In another example, the Corps' jurisdiction over removals under Section 404 was limited by a U.S. District Court case (*American Mining Congress, et al. v. United States Army Corps of Engineers, et. al., and National Wildlife Federation, et. al.*). Neither case affected the state's jurisdiction over wetlands and waters.

DSL administers the Removal-Fill Law under Oregon Revised Statutes (ORS) 196.800 - 196.990 and serves as the state's lead wetland conservation agency under ORS 196.668 - 196.692. Removal and filling activities in state scenic waterways are regulated under ORS 390.805 – 390.925. Oregon Essential Indigenous Anadromous Salmonid Habitat rules are at OAR 141-102-0000 – 0045. At this writing there are ten General Authorizations in effect (OAR 141-089-0100 – 0610).

Discussion

Pursuant to ORS 196.810, in most instances, permits are required to remove material from beds or banks or fill any waters of the State of Oregon. The definition of *waters of this state* is contained in ORS 196.800(15).

> *ORS 196.800(15)*
> *"Waters of this state" means natural waterways including all tidal and nontidal bays, intermittent streams, constantly flowing streams, lakes, wetlands and other bodies of water in this state, navigable and nonnavigable, including that portion of the Pacific Ocean which is in the boundaries of this state. "Waters of this state" does not include the ocean shore, as defined in ORS 390.605, with the exception of those areas where removal or fill activities are regulated under a state-assumed permit program as provided in 33 U.S.C. 1344(g) of the Federal Water Pollution Control Act, as amended.*

The state definition of *wetlands* is identical to the federal definition of *wetlands*. The only difference is that the federal definition includes specific examples that, while not included in the state definition, are nonetheless encompassed by the state definition.

> ORS 196.800(17)
> *"Wetlands" means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.*
>
> Federal Register, Vol. 51, No. 219, November 13, 1986
> 33 CFR Part 328.3(b)
> *The term "wetlands" means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal*

circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

Oregon's administrative rules for issuance and enforcement of removal and fill permits (OAR 141-085-0005 to OAR 141-085-0660) govern the administration, enforcement and control of the removal of material from the beds and banks or filling of the waters of the state. Jurisdiction is defined under ORS 141-085-0015.

The terms *fill* and *removal* are defined by law, and are subject to a 50 cubic yard threshold under the removal-fill law (except in Essential Indigenous Anadromous Salmonid Habitat (ESH), where the 50 cubic yard exemption does not apply).

ORS 196.800(5)
"Fill" means the total of deposits by artificial means equal to or exceeding 50 cubic yards or more of ***material*** *at one location in any waters of this state. (emphasis added)*

ORS 196.800(13)
"Removal" means the taking of more than 50 cubic yards or the equivalent weight in tons of ***material*** *in any waters of this state in any calendar year; or the movement by artificial means of an equivalent amount of material on or within the bed of such waters, including channel relocation. (emphasis added)*

The term *material* is defined by statute.

ORS 196.800(9)
"Material" means rock, gravel, sand, silt and other inorganic substances removed from waters of this state and any materials, organic or inorganic, used to fill waters of this state.

The 1993 Legislature recognized that small projects, amounting to less than 50 cubic yards of fill or removal, may affect native salmon and some species of native trout. With the assistance of the Oregon Department of Fish and Wildlife (ODFW), DSL has identified ESH in waterways across the state and adopted administrative rules that require a permit for alteration activities (regardless of the cubic yards involved) in these areas. *Essential indigenous anadromous salmonid habitat* is defined in ORS 196.810(f)(B) and state policy is further set forth in OAR 141-102-0000 - 141-102-0045.

ORS 196.810(f)(B)
"Essential indigenous anadromous salmonid habitat" means the habitat that is necessary to prevent the depletion of indigenous anadromous salmonid species during their life history stages of spawning and rearing.

DSL issues individual removal-fill permits, and may also grant general authorization (GA) for removal of material from the bed or banks or the filling of any waters of the state without a permit from DSL. DSL may only adopt a GA by rule when it finds that those activities subject to the general authorization are substantially similar in nature and would cause only minimal individual and cumulative environmental affects, and would not result in long-term harm to water resources of the state, including streams and wetlands (ORS 196.850). Data for each permit or authorization issued by DSL are compiled into annual reports.

At this writing there are ten GA's in effect. Nine of the GA's require that an application be submitted to DSL. Seven of the nine require that applications be circulated for public comment. These seven GAs include: GA for Fish Habitat Enhancement; GA for Streambank Stabilization; GA for Certain Transportation-Related Structures; GA for Wetland Restoration and Enhancement; GA for Removing and Disposing of Sediment Behind Tidegates for Channel Maintenance; GA for Piling Placement or Removal Within Waters of the State; and GA for Minor Impacts to Freshwater Wetlands located within Urban Growth Boundaries or Urban Unincorporated Communities. Two of the GAs do not require a public review period, these are: GA for Minimal Disturbance Activities (<2 cubic yards) within Essential Indigenous Anadromous Salmonid Habitat; and GA for Oregon Department of Transportation Bridge Replacement and Repair Projects.

The tenth GA, GA for Recreational and Small Scale Placer Mining within Essential Indigenous Anadromous Salmonid Habitat (Essential Salmon Habitat), requires notification to DSL, but is not circulated for public comment. This GA is unique in that it requires the authorization holder to submit annual reports to DSL indicating the estimated amount of material removed, placed or altered in each waterway that is mined during the preceding year.

DSL has compliance monitoring and enforcement programs to monitor and implement the terms of its permit conditions, and to assure that regulated activities conducted in jurisdictional waters have been authorized by DSL. These programs are discussed under **B.5. Monitoring and Reporting**.

A.7. Funding Mechanisms

Since the program is funded with other than General Funds, the state's economic outlook does not directly affect the agency. DSL derives revenues from lands managed by the agency and by permit fees. The funding for operation and administration of the removal-fill program, including the wetland conservation program and South Slough NERR is extremely stable and has been dependable for many years. There is no expectation that the situation will change in the foreseeable future. There are no General Funds (i.e. primarily derived from state income taxes) supporting these programs. Nearly 100% of the funding comes from fees and charges for the use of state-owned waterway lands. While about $1,000,000 per year come to the department from sand and gravel royalties, nearly 90% of this revenue comes from royalties paid for Columbia River sand taken from the navigation channel, or nearby. Funding for some wetland restoration activities comes from the Wetland Mitigation Bank Revolving Fund established by state law.

A.8. Implementation Schedule

The removal-fill permit program is based an applicant submitting a permit application. Compliance monitoring and enforcement actions are taken as required.

A.9. Conservation Agreement

Not applicable.

B.1. – B.6 The Certainty that Conservation Efforts will be Effective

Statewide Wetland Goals

Oregon statutes (ORS 196.672 (4) & (5)) require the state to "maintain a stable resource base of wetlands" and to "encourage wetland restoration and creation…". A second requirement is found in the Oregon Benchmarks: BM 77 sets a no net loss goal for freshwater wetlands and a net gain goal (250 acres/year) for tidal wetlands.

Primary threats resulting in loss of wetland acreage include conversion to agriculture (#1) and urbanization. Primary programs that are in place to address the trends include: (1) comprehensive estuary management plans that prohibit development in 98% of the state's estuarine wetlands; (2) the state Removal-Fill Law which regulates fill and removal in wetlands; (3) the state mandated Land Use Planning program that establishes urban growth boundaries that contain dense development; (4) the Statewide Wetlands Inventory program which helps cities plan around wetlands and landowners avoid wetland impacts (62 cities to date have approved, parcel-based wetlands inventories); and (5) development of watershed plans (by local watershed councils) that include riparian and wetland protection and restoration elements. http://oregon.gov/OWEB/docs/pubs/ws_assess_manual.shtml

DSL reports annually to the Oregon Progress Board on the state's progress toward the no-net-loss of freshwater wetland and net gain of estuarine wetland goals. (These data are also included as a performance measure in the agency's strategic plan and budget documents.) http://www.oregonstatelands.us/stplanadopted03.htm The primary data source is the Land Administration System at DSL; data on permitted wetland fill, type and amount of required compensatory mitigation, and voluntary restoration that requires a state permit are entered into LAS. In addition, the Oregon Watershed Enhancement Board (OWEB) requires completion of a restoration reporting form for all restoration projects funded by OWEB. http://oregon.gov/OWEB/MONITOR/OWRI.shtml

Oregon's Nonregulatory Program

DSL's data indicate a small gain in both freshwater and tidal wetland acreage as indicated by permit data (LAS). Changes in wetland function and condition are not well monitored. Required wetland compensatory mitigation for permits does not, by itself, exceed permitted wetland acreage loss because enhancement of existing wetlands is a common mitigation approach. In addition, not all activities are regulated and not all violations reported and resolved. Therefore, while the estuary plans and the state's regulatory programs are essential components of stemming wetland loss, non-regulatory wetland restoration has been an essential component of no-net-loss and especially net gain policies and objectives.

The state's net gain of 250 acres/year of estuarine wetland goal is measured through the permit database (LAS), which can differentiate between compensatory mitigation and voluntary restoration, and is supplemented by the OWEB restoration project database (for any projects that did not require a state permit). The data is compiled and reported annually.

Issues faced by the state related to no-net-loss/net gain include: heavy reliance on wetland enhancement for compensatory mitigation; small wetland fills (less than 50 cubic yards) that do not require a state permit and compensatory mitigation; broad agricultural exemptions in both state and federal law; and due to dry summers, seasonal wetlands dominated by water tolerant grasses fields that are not readily recognized by the public as wetlands (leading to inadvertent violations and a need for education on the importance of seasonal wetlands).

DSL, with U.S. Environmental Protection Agency (EPA) grant assistance, has implemented targeted wetland status and trends studies to obtain trend data that is not tied to/limited by permit data. We have targeted those regions where agricultural and development impacts to wetlands primarily occur (non-mountainous areas west of the Cascade Range). The first study was "Wetland and Land Use Change in the Willamette Valley, Oregon: 1982 to 1994" published in 1998. We followed up on this study with a comprehensive investigation of the regulatory implications of the documented changes—in other words, did the changes require a state or federal permit and, if so, did they get one? (Wetland Regulatory Compliance in the Willamette Valley, Oregon: 1982 to 1994, December 2000.) We are aware of no similar study in the U.S. A second trend period for the Willamette Valley study has been initiated—it will document changes from1994 to 2004. The second major status and trends study is for the coastal lowlands ecoregion (Columbia River to Oregon/California border); this study will be completed in 2005. http://www.oregonstatelands.us/wetlandeduc.htm

State regulatory program (including voluntary restoration) wetland acreage change data for the past four years is provided in the table below.

Wetland Change in Acres per fiscal year	00-01	01-02	02-03	03-04	Total
Freshwater Wetland	129	91	35	75	330
Estuarine Wetland	-2	1	-2	13	10

Data Source: DSL permit database (LAS)

Oregon regulates so-called "isolated wetlands" through the state regulatory program. The most vulnerable wetlands therefore are not "isolated" wetlands, but those wetland types that have experienced the most loss, historically. Therefore, one component of restoration goals and planning is to focus more attention on restoration of "at risk" wetlands and wetland types that have experienced the most significant loss and degradation. These include (1) Willamette Valley wet prairie (99% lost); (2) Sitka spruce tidal swamps (imperiled); (3) Agate Desert vernal pools (ca. 40% gone; most of remainder highly degraded); and (4) tidal wetlands generally (ca. 68% loss). For more detailed explanation of risks and related recommendations, see the Estuarine and Freshwater Wetland chapters from the Oregon State of the Environment Report 2000 http://www.oregonstatelands.us/soer_intro.htm

Comprehensive Strategy

Comprehensive Strategy: Oregon developed and adopted *Oregon's Wetland Conservation Strategy* in 1995. The State Land Board endorsed this strategy. (Governor, Secretary of State, State Treasurer). Several work groups representing multiple interests, including state and federal agencies, developed the Strategy. It includes guiding principles and priorities for strategic implementation. The Strategy addresses: regulation; wetland planning; wetland protection; wetland restoration; public information; best management practices; public lands management; and wetland inventory and research needs. Several of the recommendations in the plan have been implemented. For example, one recommendation was to eliminate duplicate permit processes—Oregon is close to obtaining an SPGP; another recommendation was to develop a wetland restoration policy—DSL convened a work group to develop *Recommendations for a Nonregulatory Wetland Restoration Program*. The Wetland Conservation Strategy is included by reference in DSL's Strategic Plan.

Program Coordination

Oregon has several natural resource agencies rather than a single "Department of Natural Resources." For this reason, Oregon's wetland related programs are networked. DSL is the designated "lead agency" for wetlands, in large part because the state Removal-Fill program has been administered by DSL for more than 35 years. In 1989, a comprehensive wetland bill was passed that made many improvements to the Removal-Fill Program and created the Wetlands Program at DSL. The implementing legislation included findings on the importance of coordinated local-state-federal wetland programs (ORS 196.668) and also articulated several state policies (ORS 196.672) aimed at better coordinating wetland programs. For example:

> "Promote the protection, conservation and best use of wetland resources, their functions and values through integration and close coordination of statewide planning goals, local comprehensive plans and state and federal regulatory programs."
> "Use a single definition of wetlands for the purposes of ORS 196.800 to 196.905 and statewide planning goals and a single, uniform methodology of delineating wetland boundaries."
> "Develop a statewide inventory of wetlands . . . . and make such inventory available to state agencies and local governments to facilitate better management of wetland resources and closer coordination of local, state and federal wetland programs."

Some (of many) outcome examples of coordination activities include:

- Wetlands Inventory Maps distributed to all Oregon Cities and Counties through workshops that including training for planners on how to use the maps;
- A state law requiring cities and counties to notify DSL in writing of applications they receive that appear to affect mapped wetlands (ca. 500 processed by DSL annually);
- Rules developed for Local Wetlands Inventories (OAR 141-086-0180 to 0230) and 62 city-wide inventories completed according to the rules. http://www.oregonstatelands.us/141-086_LWI.htm . DSL staff attend local planning commission and public meetings during LWI development. LWI maps are also provided to the Corps of Engineers (Portland District) and made available to EPA and other agencies.
- Numerous training sessions by DSL wetland staff for other Oregon resource agencies (Dept. of Forestry; Dept. of Fish and Wildlife; Land Conservation & Development Department; Dept. of Transportation).
- Joint publication of *Oregon Wetland Planning Guidebook* (2004) by DSL and Oregon Dept. of Land Conservation and Development.
- DSL wetland staff, Oregon Watershed Enhancement Board staff, and OSU Extension staff collaboration on wetland education (wetland identification, functions and restoration) for Local Watershed Councils throughout the state.
- Multi-interest advisory committee has been meeting regularly for more than two years to help craft the changes needed for an SPGP for Oregon.
- Mitigation Bank Review Teams for guidance on a mitigation banking program and to address individual proposed mitigation banks (from prospectus to certification of credits).

A primary coordination mechanism in Oregon is through the Statewide Land Use Planning Program, noted above, that provides protection to 98% of Oregon's estuarine wetlands and requires local governments to address freshwater wetlands in their comprehensive plan and ordinances. The Land Conservation and Development Commission sets the land use planning requirements, and DSL establishes many of the specific technical requirements to ensure science-based methods and statewide consistency (e.g., wetland inventory rules and tools and rules for identifying "significant wetlands" for local protection).

Some examples of coordination among a diversity of groups include:

- *Oregon's Wetland Conservation Strategy* (1995) that included representatives of 49 agencies, organizations and businesses.
- *Recommendations for a Nonregulatory Wetland Restoration Program* project workgroup included multiple interests such as NRCS, USFWS, local government, private consultants, Oregon State University, NOAA, Corps of Engineers, etc.
- Development of a Tidal Wetland HGM Guidebook that involved local watershed council members, tribes, the South Slough National Estuarine Research Reserve and private landowners.

- A Removal-Fill Program Technical Advisory Committee that has met monthly (more or less) for approximately 3 years to address state/federal program coordination, rule changes, SPGP issues, and other issues as they arise.
- NWI and Local Wetlands Inventory maps and data are used in watershed assessments by local watershed councils (specifically referenced in the *Oregon Watershed Assessment Manual).*
- A Technical Advisory Committee recently assembled by DSL and EPA to help scope out issues and needs related to development of an Oregon Rapid Wetland Assessment Method.

All wetland fill permits issued by DSL require that the permit applicant meet water quality standards established by the Dept. of Environmental Quality (DEQ). DEQ provides comments to DSL on all removal or fill applications, with particular attention to discharge of untreated stormwater to wetlands and compensatory mitigation sites. DEQ has participated in work groups assembled by DSL to develop wetland function and condition assessment methods, including a current scoping effort aimed at developing a rapid wetland assessment protocol for multi-agency use in Oregon.

DSL has a Memorandum of Agreement (MOA) with the Oregon Department of Forestry (administers Forest Practices Act wetland regulations); the MOA addresses coordination needs such as joint training and enforcement. DSL also works closely with the Water Resources Department on water rights for wetland restoration issues, and eliminating irrigation "push-up dams" in streams. In addition, the Oregon Department of Agriculture (ODA) administers a program aimed at helping farmers reduce water quality impacts on a watershed basis (for Total Maximum Daily Load (TMDL)-limited water bodies). DSL is developing an MOA with ODA to address joint training needs so that each agency can better address wetland and waterway protection through cooperative efforts. DSL also collaborates with the Oregon Watershed Enhancement Board (as with this report) to better integrate wetland protection and restoration into locally developed watershed management plans.

The state has performance measures related to no net loss and net gain of wetlands with a basis in state law. DSL reports on the performance measures annually to the Oregon Progress Board, which in turn reports to the state legislature. DSL also reports directly to the state legislature and interest groups through our Strategic Plan and budget documents. Wetland gain and loss data is tracked through DSL's Land Administration System (LAS) and through annual reports. Regulatory compliance data is also tracked through LAS and in periodic studies and reports. OWEB tracks restoration projects through its Restoration Database.

Performance measure information is used to improve programs. For example, the state has a strong interest in developing capacities to not only improve our tracking of no-net-loss and Net Gain, but also to move toward evaluating and monitoring wetland health. This is a significant challenge for any state, and perhaps especially for large western states with sparse population and severe budget constraints. Toward this end, however, former Governor Kitzhaber convened a panel of experts led by the President of Oregon State University to develop a *State of the Environment Report* and related recommendations. The report was completed in 2000 and provides a comprehensive look at the status of Oregon's natural resources and a blueprint for state action.
http://www.oregonstatelands.us/soer_intro.htm

Of particular relevance to this project proposal, we recognize the limitations in our wetland gain and loss data and the need to develop more consistency in how we identify and measure wetland change. With a focused effort planned for implementation late 2005, DSL will do a better job of ensuring consistent (interagency) wetland determinations (DSL, Corps, NRCS, FWS), obtain much improved restoration project baseline data, and begin to apply newly-developed wetland assessment methods to wetland restoration projects (before and after). We have had discussion with NRCS and other agencies about this need and it is one reason these agencies are participating on our current interagency work group to develop the Oregon Rapid Wetland Assessment Protocol.

DSL prepares an annual Removal-Fill Program report that includes both regulatory and non-regulatory program data and accomplishments. Non-regulatory program information in the report includes:

- Wetland Land Use Notices submitted to DSL by local governments (local-state coordination).
- Number of wetland maps dispensed (DSL is the state distribution center for NWI maps).
- Number of Local Wetlands Inventories approved and in progress with DSL assistance.
- Performance measure information, including number of wetland determinations conducted by DSL staff for landowners and local governments (part of our prevention efforts).
- Special projects completed, such as publication of the Wetland Planning Guidebook or completion of the Willamette Valley HGM Guidebook.
- Major program changes.

Monitoring and Assessment

Monitoring Strategy and Objectives: An interagency Steering Group is working with a Technical Advisory Committee to scope out the best approach for a Rapid Wetland Assessment Protocol for meeting multiple agency objectives. Agencies (programs) represented on the Steering Group include DSL, DEQ (water quality programs), EPA, Corps of Engineers, NRCS, U.S. FWS and Oregon Dept. of Fish and Wildlife.

The other approach Oregon has taken with respect to monitoring is through targeted wetland change (status and trends) studies. EPA grants have provided primary funding along with OWEB and DSL. Other active participants are the Corps of Engineers, Portland District, through provision of new aerial photography and participation on the project advisory committee, and FWS/NWI staff who conduct the aerial photo interpretation and mapping. These studies are designed to evaluate wetland changes independent of permit activity, including wetland loss, gain, and wetland classification changes (e.g., shrub wetland to emergent farmed wetland). The link to the initial Willamette Valley change study is below; funding has been provided to update that study to 2004, and the coastal wetland changes study should be completed fall of 2005. These studies provide an excellent "check" on the reliability of permit data for tracking no net loss and net gain goals.
http://www.oregonstatelands.us/wetland_will_valley.pdf

The wetland status and trends studies are targeted at ecoregions that have experienced and continue to experience the most wetland alteration. To date, these regions include the Willamette Valley (contains most of the state's population and agricultural production) and the coast. These will be updated as cooperative agreements are developed and funding obtained. The Willamette Valley update (to provide data for a 20-year period) is currently scheduled. The next target regions are the Umpqua and Rogue basins in Southern Oregon, which are experiencing significant population growth.

The Willamette Valley wetland change study used a statistically valid sampling design that had rigorous, independent peer review prior to initiating the change mapping. The Coastal Wetland Trends study underway is a complete census mapping because the statistical advice we received indicated that there was no reliable sampling design for that diverse region. Both studies are conducted according to the National Wetlands Inventory Status and Trends protocol and NWI staff and their contractors conduct the mapping.

To date, Oregon has primarily invested in Level 2 Rapid Assessment methods. These include the *Oregon Freshwater Wetland Assessment Method* (first published in 1993) used widely for local wetland planning and protection; the Statewide HGM Classification and Functional Profiles; the Willamette Valley HGM Guidebook (2 subclasses); and the Tidal Wetland HGM Guidebook (to be completed this summer). Level 3 site assessments have been done on 109 wetlands in the Willamette Valley and more than 120 tidal wetlands that were reference sites that provided data for the Level 2 HGM assessment models. These products were peer reviewed prior to publication. Field testing and refinement is ongoing.

Data Management and Analysis

The HGM reference site data are on a CD and are available to anyone. Data on permitted wetland gains and losses, by Cowardin and HGM classification, are contained and tracked in DSL's database (LAS) as described in detail elsewhere. The data can be exported to other platforms. The DSL data are used to track progress toward meeting the no net loss and net gain goals, and for tracking permit and compensatory mitigation compliance.

Mapping, Inventory and Classification: A primary goal of the 1989 comprehensive wetland bill establishing the Wetlands Program at DSL was to greatly improve wetland inventory information and usefulness. The bill required DSL to ". . . compile and maintain a comprehensive Statewide Wetlands Inventory." It also specified that DSL would establish standards by rule, consult with other state and federal agencies in developing the SWI, and distribute the SWI to local governments and other agencies (ORS 196.674). Since that bill was passed, Oregon has taken significant steps:

- DSL operates as the State Distribution Center for the National Wetlands Inventory;
- DSL developed detailed administrative rules in 1991 (and updated) for targeted Local Wetlands Inventories (LWI) within urban growth boundaries (OAR 141-086-0180 to 0240). Because much of Oregon is remote and lightly populated and Oregon's Land Use Planning System limits development to within Urban Growth Boundaries, the SWI approach relies upon the NWI for those wide open spaces supplemented by LWIs in urbanizing areas. LWIs

replace the NWI for the area covered. They are parcel-based, comprehensive, include onsite verification (where access permitted), include a description of each wetland, include both Cowardin and HGM classification, and include a wetland function and condition assessment using the *Oregon Freshwater Wetland Assessment Methodology*. The LWI rules include a public participation process and an update procedure.

- The Land Conservation and Development Commission requires LWI rules to be followed by any city conducting a wetlands inventory to meet wetland resource planning requirements (a key coordination mechanism).
- More than 60 LWIs have been completed and adopted to date.
- DSL provides technical assistance to cities and consultants to develop the LWI, participates in public meetings during development, and provides training to local governments and elected officials in using the Statewide Wetlands Inventory.

Program Reporting and Evaluations

No-net-loss/Net Gain data are used to track how well compensatory wetland mitigation (CWM) alone (i.e., the state permit program) and as supplemented by voluntary wetland restoration are working to maintain the wetland resource base as required by state law. The program results are referenced during removal-fill rulemaking and are provided to the public and legislators. The data helps the agencies demonstrate the need for existing CWM ratios, which are often challenged. This data source is supplemented in target regions (Willamette Valley and coastal region) by Wetland Status and Trends studies. This trend data source is an important supplement to and "check" on permit data, because it is independent of permit programs. While the permit program data shows a slight net gain, trends studies may also capture unpermitted and exempt wetland losses. For example, the original Willamette Valley study (1982 -1994) showed a net loss of 546 acres of wetland per year. (Note that the start date—1982—predated "modern" wetland regulations and Swampbuster provisions of the Farm Bill.) It also provided some information on wetland degradation, e.g., conversion of forested wetland to farmed wetland. The studies are conducted according to FWS Status and Trends protocols. The Willamette Valley study used a statistically valid sampling methodology; the coastal change study was a complete census; and all studies are peer reviewed.

Restoration and Protection Partnerships

Restoration Goal: The state recognizes the crucial role of wetland restoration in meeting the state's no-net-loss of freshwater wetlands goal, and the net gain of 250 acres/year of estuarine wetlands goal.

Strategy/Plan to Implement Restoration Goals: The study/report *Recommendations for a nonregulatory Wetland Restoration Program for Oregon* is the primary state strategy/plan for wetland restoration in the state. The Report was endorsed by the State Land Board and is adopted into DSL's strategic plan. The plan contains 10 recommendations, each with a set of implementing actions. It provides a statewide framework for restoration planning, including a tiered approach for restoration planning and assessment at the (1) Level III Ecoregion level; the (2) Watershed level and the (3) Site/Project level. The plan is a policy and strategic document rather than a plan that identifies specific

areas and acreages for restoration. The plan uses the definition of restoration suggested by the National Academy of Sciences Committee on Restoration of Aquatic Ecosystems. However, as discussed below, DSL tracks wetland gain and loss using a definition that does not "count" enhancement of existing wetlands as a "restoration" gain.

OWEB is taking the lead on developing restoration priorities for the state at the 4th field hydrologic unit scale. Wetland restoration will be a priority where there has been significant historical wetland loss and/or where wetlands are of particular significance for water quality and other aquatic resources.

Implementing Restoration Goals

The approach for setting restoration priorities has been developed by OWEB, as noted above, but the actual on-the-ground priorities have not yet been set (that effort is in progress). DSL has begun to implement several of the restoration program recommendations. For example, the state has developed an ecoregion-based HGM classification for Oregon and begun to develop HGM guidebooks for target regions. The tidal HGM guidebook is being developed cooperatively with the Coos Watershed Association with specific plans to use the guidebook for tidal wetland restoration planning, siting and monitoring.

OWEB administers state funds dedicated to habitat acquisition and restoration. Generally, these funds are matched with federal funds, such as the Fish and Wildlife Service Coastal Wetland Grant funds. Since 1997, 1,577 acres of coastal wetland (tidal and non tidal) have been acquired through these cooperative state-federal efforts. OWEB also administers a small grant program for watershed assessment and restoration activities at the local level: http://oregon.gov/OWEB/GRANTS/index.shtml

Acres of Land Acquired with the Assistance of an OWEB Grant
1997-2004 on North Coast Coastal Coho ESU (Cape Blanco-Seaside)

1. Tillamook Coastal Wetlands (Tillamook Bay)	355 acres
2. Coos Coastal Wetlands (Coos & Coquille)	465 acres
3. Dawson Wetlands (Umpqua)	30 acres
4. Clay Myers State Park (Sand Lake)	180 acres
5. Circle Creek (Necanicum)	365 acres
6. Neawanna (Necanicum)	67 acres
7. Ecola Creek	120 acres
Total acreage	1,582 acres

Tracking/Reporting System for Wetland Restoration:

The state tracks the quantity and type (Cowardin and HGM class) of wetland losses and gains, but not the quality. There are two database mechanisms for tracking and reporting wetland restoration—the DSL permit database (LAS) and the OWEB restoration project database (http://oregon.gov/OWEB/MONITOR/OWRI.shtml). To date, all projects reported in the OWEB database have also been included in the LAS, because all (or nearly all) wetland restoration projects require a state permit. (Therefore, all projects by all partners and others should be included in the database.) The data includes permitted projects on all lands with the possible exception of some tribal lands. Data from LAS is reported annually in the Removal-Fill Report and to the Oregon Progress Board. The system can track the location, amount and type(s) of wetland restoration. The centralized database provided by LAS is crosschecked with the OWEB database; so double counting is not a problem. Rather, the main challenges are (a) consistent reporting of wetland restoration (actual gain) as opposed to wetland enhancement; (b) accurate reporting of associated wetland loss, for example by construction of water-retention levees; (c) improving the data quality in LAS; and (d) beginning to assess and track changes in wetland quality associated with restoration projects. Meeting these challenges are a major focus of the proposed demonstration project under this grant.

Outreach and Education

Strategic Outreach and Education Plan: Public Information and Technical Assistance recommendations were included in the *Oregon Wetland Conservation Strategy*. Wetland education and outreach is a networked program, with each agency focusing on their specific mandate and expertise. For example, much of DSL's outreach effort relates to the regulatory program. However, there are coordinated efforts and some forums for coordination. Those forums include: Oregon Habitat Joint Venture meetings and newsletter; DSL's Removal-Fill Technical Advisory Committee (see below); and the Oregon Watershed Enhancement Board Biennial conference. State programs do not attempt to duplicate general wetland education programs provided by local groups; instead, they focus on state issues or priorities such as information on vernal pool wetland conservation planning or to remind the regulated public that the state still regulates isolated waters.

Target Audiences: Explanation of why and how key target audiences are identified and reached are outlined through several examples, below. It is not a comprehensive discussion.

- *Key Stakeholders*—DSL meets monthly with a group of landowners, consultants, agency personnel, developers, realtors, farm bureau and others representing a wide range of interests to provide updates and obtain feedback on program initiatives, pending legislation, and the states regulatory streamlining (SPGP) efforts.
- *Local Governments*—as described in previous sections, local governments are a primary target audience and partner in wetland planning and protection in Oregon. DSL and the Land Conservation and Development Department interact with local governments on a daily basis. On a regular basis, DSL provides technical assistance, fact sheets, and workshops on wetland identification, wetland inventories, implementing the required wetland land use notification process, and the interaction between local and state wetland regulations. Local planners are often the "front line" communicators with persons wishing to impact wetlands, so these efforts both inform and support the local officials.

- *Developers*—DSL communicates with developers and others at least quarterly through a newsletter and through e-mail. We have developed a comprehensive mailing list. We also give presentations to Homebuilders and Realtors and other organizations upon request. Much of DSL's outreach effort to developers is aimed at providing helpful permit process information that will improve compliance and reduce frustration.
- *Consultants*—DSL maintains an active outreach program for wetland consultants. For at least a decade we have held an annual meeting (jointly with the Corps of Engineers); in recent years DSL has taken the lead on quarterly meetings with consultants. We supplement those meetings with e-mail announcements and a special section of our web site ("frequent filers') where we post current information. Meetings cover subjects such as changes in removal-fill rules, updates on the SPGP effort, presentations by DEQ on stormwater management plan requirements, and guidance on wetland delineation reports.
- Watershed Groups/Extension Service—OWEB hosts a biennial conference for watershed council members and others and has a comprehensive information program that includes publications, meetings, and their website. http://oregon.gov/OWEB/publications.shtml.
  In addition, OSU Extension provides a Watershed Stewardship education program that includes a wetland component, focusing on wetland functions and restoration. DSL wetland specialists helped to develop the wetland component, including a course outline and presentation materials and co-taught many of the initial courses. Participants in these programs are often opinion leaders in their communities and/or local watershed councils, who share the information and skills they learn. http://seagrant.oregonstate.edu/wsep/learningguide.html
- Landowners, community leaders, teachers and youth—The South Slough National Estuarine Reserve provides an excellent education and outreach program targeted to these audiences, primarily but not restricted to the South Coast. http://www.southsloughestuary.org/ They receive 25,000 visitors and reach 6,200 students each year.

Survey/Evaluate: Examples of how the state evaluates outreach effectiveness include:

- DSL—DSL surveys participants in all wetland consultant meetings and education or outreach presentations. We also provide opportunity for any person to provide feedback online regarding any DSL program or agency/staff interaction.
- OSU Extension Watershed Stewardship Courses—an evaluation form is completed by all participants for each course, and forms are provided to the instructors (for feedback) as well as to the program director. The Watershed Stewardship Education Program conducted an evaluation, including participant's self assessment of new knowledge and skills.

Vulnerable Waters

Oregon is fortunate that our regulatory program is independent of the federal program, such that isolated waters were not put at risk to the extent that they were in many other states. That said, however, any time there is a major, high profile change in federal wetland regulations, the state makes an immediate effort to provide information and dispel misinformation. Immediately after the SWANCC decision (U.S. Supreme Court case that led the federal government to exempt so-called *isolated wetlands*, do not pertain to Oregon statute (*Solid Waste Agency of Northern Cook County (**SWANCC**) v. United*

States Army Corps of Engineers)), DSL targeted key audiences with very specific information. We contacted the Metropolitan Homebuilders Association, local governments, public works and road departments and other groups by e-mail, newsletter (theirs and ours) and phone to make sure they understood the SWANCC decision did not alter state law. We also used the Removal-Fill Technical Advisory Committee (TAC) (described above) to help spread that message. It required considerable effort in the legislative session following the SWANCC decision to convince lawmakers that "isolated wetlands" have substantial value and that the state should not weaken the state regulatory program. That effort will likely continue in the 2005 session.

With respect to critical wetlands, DSL has (a) collaborated with EPA and The Wetlands Conservancy (an Oregon nonprofit) on an Oregon's Greatest Wetlands project; (b) highlighted the number of "imperiled" wetland plant communities (29%) and loss of specific wetland types (99% of Willamette Valley wet prairie) in the *Oregon State of the Environment Report 2000* (Attachment E); and (c) collaborated with the FWS, EPA, and local government to provide information to the public and decision makers about the rare Agate Desert Vernal Pools in SW Oregon, as part of an interagency HCP/WCP effort to protect those wetlands.

Hands-on Volunteer Activities: State programs to provide opportunity for hands-on wetland education are conducted primarily through the South Slough National Estuarine Reserve.

Technical Assistance: State program technical assistance to landowners on wetland restoration is provided primarily by the Oregon Department of Fish and Wildlife. They work very closely with the FWS, NRCS, Joint Venture and OWEB on planning, implementing and monitoring wetland restoration projects. DSL wetland and regulatory staff provide technical assistance for those projects as it relates to wetland determinations and permit requirements. DSL has teamed up with the Department of Forestry to provide wetland training for private forest managers, and DSL has conducted workshops for Dept. of Forestry and Oregon Dept. of Fish and Wildlife staff. DSL staff regularly meet with city and county planning and public works staff to provide information on wetland identification and NWI map use; wetland regulations; developing Local Wetlands Inventories and local wetland protection ordinances; and to participate in stormwater and transportation planning efforts to help cities plan around wetlands, considering landscape linkages and watershed processes.

As noted earlier, voluntary wetland restoration is a critical component of the state's no-net-loss and net-gain goals. The state's regulatory program incorporates a no net loss performance measure for its permits, but some activities do not require a state permit and there will always be undetected violations.

Wetland Trends in the Ecologically Significant Unit (ESU)

From July 1, 2000 to June 30, 2004 DSL authorized 105-acres of wetland fill within the contiguous boundaries of Clatsop, Coos, Douglas, Lane, Lincoln and Tillamook Counties. Due to time constraints, DSL did not disaggregate the wetland fill data (or check each permit file) to verify the type of wetland that was filled for just that portion of the county that is in the ESU. . However, in our professional opinion we believe that the data we have provided are representative of the ESU. Some wetland loss

also may have occurred due to unauthorized activities (i.e., violations). DSL investigates complaints to verify jurisdiction on a priority basis. DSL resolves confirmed violations involving wetland fill by requiring the responsible party to perform on-site remediation and/or to provide compensatory mitigation.

During this same time period, DSL required approximately 161 acres of various types of on-site and off-site compensatory wetland mitigation (CWM) to offset these permitted wetland losses (see Table 1). In some cases, DSL may also approve the use of wetland mitigation banks, payment-to-provide (PTP) and/or conservation in lieu. There are currently no mitigation banks offering credits in the ESU. DSL funded one project in the ESU in FY 2002-2003 with PTP funds from the Wetland Mitigation Bank Revolving Fund. DSL disbursed $45,500 to the North Coast Watershed Association for a coho habitat enhancement in Johnson Slough, a tributary to the Lewis and Clark River. The project will remove and replace a tidegate; opening up approximately 7 miles of spawning habitat and 1.5 miles of estuarine rearing habitat.

The objective of CWM is to replace lost functions. Applicants applying to DSL to construct projects in wetlands must submit an assessment of wetland functional attributes for both the project site and the mitigation site. To assist applicants in this process, DSL developed the Guidebook for Hydrogeomorphic (HGM)—based Assessment of Oregon Wetland and Riparian Sites: Statewide Classification and Profiles, February 2001. So far DSL has developed HGM assessment methods for the Willamette Valley ecoregion, riverine impounding and slope/flats wetland subclasses. At this writing a similar assessment method is being developed for three classes of tidal wetlands. DSL is assembling a technical advisory committee to help it develop a method for rapidly assessing wetland functions (working title; Oregon Rapid Assessment Protocol). In addition to the CWM required by DSL, the Oregon Watershed Enhancement Board (OWEB) reports that it funded 130 acres of non-mitigation wetland restoration that was completed during this same period in the ESU.

On balance, taking into account the DSL and OWEB data, the trend in the ESU appears to be consistent with statewide goals of no net loss in freshwater wetland area, and a net gain in estuarine wetland. Note that these data do not provide ecological information regarding the functions of the wetlands lost vs. functions of the wetland accepted as mitigation, restored from uplands to wetlands, or converted from one wetland type to another. Converting one wetland type to another does not result in a net gain of total wetland area. For example, some of the estuarine restoration being carried out converts existing fresh or brackish water marshes back to salt marsh/estuary habitat. The data do not provide information about the significance of any of these wetland changes for coho. More detailed studies would be required to address these types of questions during the recovery planning process.

Table 1. Summary of Wetland Fill, Compensatory Wetland Creation, Enhancement and Restoration, and OWEB-Funding Restoration Projects (non-mitigation) authorized/completed from July 1, 2000 to June 30, 2004 in acres.

County	Wetland Fill Permitted by DSL (County area)	CWM Required by DSL (Creation, Enhancement or Restoration)*(County area)	OWEB-Funded Wetland Restoration Projects (Non-mitigation) (ESU)
Clatsop	5.2	4.3	
Coos	9.0	20.1	
Douglas	41.2	90.1	(Dawson Creek) 30
Lane	48.7	44.4	(Enchanted Valley) 30
Lincoln	.3	.4	(Lint Slough) 70
Tillamook	.6	1.8	
Totals	**105.0**	**161.2**	**130**

Historic Wetland Losses in the ESU

Figures for historic losses of tidal wetlands in Oregon's estuaries were compiled by Good (2000), but similar figures for historic losses of freshwater wetlands are not available. Digital mapping by the National Wetlands Inventory (NWI) is useful for calculating total wetland acreage and Cowardin wetland type, but it cannot be used for identifying converted wetlands because many converted wetlands are not classified as such. For this report, DSL contracted with the Oregon Natural Heritage Information Center (ORNHIC 2004) to prepare the first estimation of freshwater losses for the coast, based on analysis of historic vegetation, hydric soils, and 1990's digital orthophotography (see Appendix I). The results of this analysis is that the estimated total acres of wetland in the ESU converted to other uses, from 1850-2000, was 43,672 acres. The 43,672 acre total includes the following: 1) freshwater wetland-34,276; 2) lacustrine (lake associated) wetlands-13 acres; 3) salt marsh-9,383; and 4) subtidal habitat-0.

Note that the coastal ESU excludes the Columbia River and all drainages south of Cape Blanco (Elk, Rogue, Pistol, Chetco, Winchuck, and others), but the latter have minimal wetland areas. Good's estimated losses for tidelands for the entire coast, including all of these estuaries, is 50,436 acres. If all the coastal estuaries were to be included in ORNHIC's estimate of total wetland converted to other uses, then the total goes up to 73,757 acres. This increase is expected as ORNHIC's numbers also include non-tidal wetland.

Value of Coastal Wetlands for Coho Salmon

Miller and Sadro (2003) concluded, in part, that the protection and restoration of the upper reaches of estuaries and freshwater/brackish water transitional habitats are important for increasing the productivity of estuaries for juvenile coho salmon. They recommended that four basic wetland environments be protected and restored in order to "increase the productivity of estuaries for juvenile Coho salmon." These environments include:

- Lowland beaver ponds;
- Transitional freshwater/brackish water marshes;
- Upper estuarine salt marshes;
- Corridors linking these habitats.

Upper reaches of estuaries and freshwater/brackish water transitional habitats provide valuable rearing and overwintering areas for Coho during unfavorable ocean conditions.

Changes Wetlands and Estuaries in the Oregon Coast ESU: 1982 - 2001

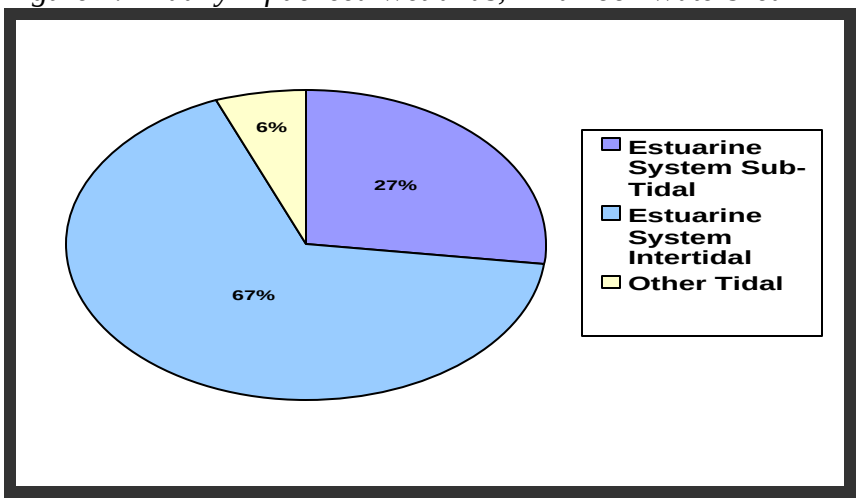
The State of Oregon has contracted with the U.S. Fish and Wildlife Service, National Wetland Inventory (NWI) to conduct a wetland change study along the Oregon Coast. This study is using infrared color aerial photography collected in 1982 and in 2001 to determine the wetland change below the 100 ft contour. The study is identifying the type of land use that caused the change (e.g., residential development and agriculture). The study is measuring the extent of wetland loss and is providing information that may be used to evaluate the effectiveness of both state and federal wetland management programs and policies, and to identify restoration priorities for coho habitat. Changes in wetland types will be mapped using both Cowardin and HGM classifications. This will provide additional information helpful to evaluating wetland changes, functions and habitat values.

Current Status of Wetlands in the Tillamook and Nestucca Watersheds

At the time of this writing, the only data that have been produced and finalized from the NWI coastal wetland trend study discussed above is for the Tillamook and Nestucca watersheds. The data were examined to consider potential acreage of these habitats that exist in both the Nestucca and the Tillamook watersheds.

Of the over 16,000 acres of coastal wetlands identified in the Tillamook watershed (below the 100 foot elevation level), 68% are tidally influenced. Of those wetlands that are tidally influenced, 9,705 acres, or 67%, are intertidal. Further breakdown of tidally influenced wetlands is shown in Figure 2, below.

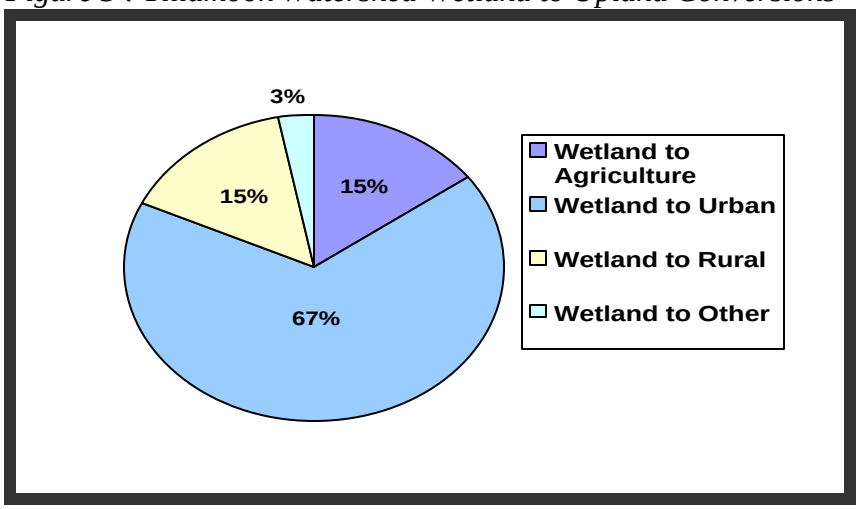
Figure 2: Tidally Influenced Wetlands, Tillamook Watershed



Within those wetlands not tidally influenced, 21% are diked/impounded wetlands. Over 1,300 acres of land could potentially revert to tidal influence if barriers were removed. Determining whether all or part of such a conversion would benefit coho and determining the feasibility of such a possible conversion is beyond the scope of this current analysis.

The NWI wetland change study also offers some insight into the wetlands trends for the two watersheds. Of the 503 acres that have undergone conversion in the Tillamook watershed (between 1982-2001), 83% of the conversion occurred from one wetland type to another, 10% from wetland to upland, and the final 7% from upland to wetland. Only 50 acres of wetlands were converted to upland. As shown in Figure 3, urban development accounted for the majority of the wetland/upland conversion (67%), with agricultural and rural activities accounting for the remainder of conversions (18%).

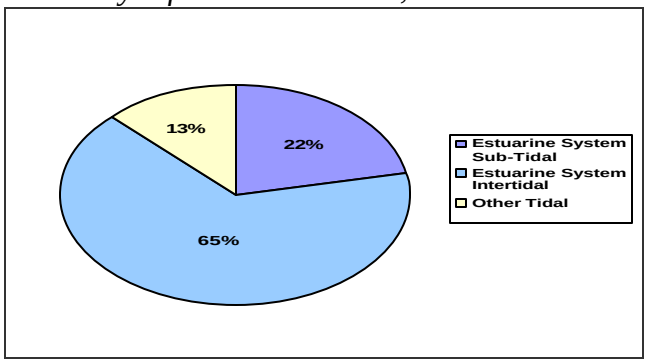
Figure 3 : Tillamook Watershed Wetland to Upland Conversions



Nestucca Watershed Summary

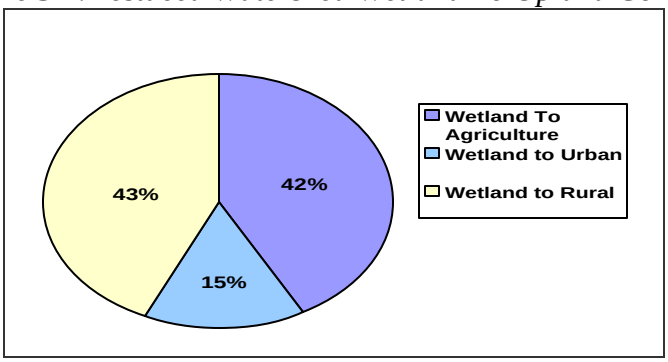
In the Nestucca watershed, the results of the analysis are slightly different. Of the over 4,100 acres of wetland within the study area, only 32% of the wetlands are tidally influenced. Within these 1,300 acres of tidally influenced wetlands, 87% are estuarine systems, either sub-tidal or intertidal. (See Figure 4) Within the 68% (2,832 acres) of nontidal wetlands, only 35%, or approximately 990 acres, could be considered potential intertidal wetlands due to the presence of a dike or impoundment.

Figure 4 : Tidally Influenced Wetlands, Nestucca Watershed



Of the 130 acres of total conversion in the Nestucca Watershed, 87% was from one wetland type to another, 11% was from wetland to upland, and the final 2% from upland to wetland. Of the 15 acres of wetland to upland conversions, rural development and agriculture are responsible for 85% of the conversion. (See Figure 5 below)

Figure 5 :Nestucca Watershed Wetland To Upland Conversions



When the NWI study is complete, DSL and the USFWS will analyze the results, including wetland-to-wetland conversions. Additional analysis of the results with specific significance to Coho would be a valuable addition.

Permit Review Criteria

The basic standards for approving, denying or approving with conditions individual permit applications is contained in ORS 196.825 and OAR 141-085-0029. The Director of DSL is authorized to issue a permit only if the proposed fill would not unreasonably interfere with the paramount policy of the state to preserve the use of its waters for navigation, fishing and public recreation (ORS 196.825(2) and OAR 141-085-0029(3)). DSL has broad discretion in applying any conditions that may be necessary to issue the permit and require mitigation for the expected adverse effects from the project.

> ORS 196.825(5)
>
> *If the director issues a permit, the director may impose such conditions as the director considers necessary to carry out the purposes of ORS 196.805, 196.830 and subsections (1) and (2) of this section….The Director of the Department of State Lands shall impose, as conditions to any permit, general authorization or wetland conservation plan, measures to provide mitigation for the reasonably expected adverse impacts from project development…*

Even more specific criteria for fills and removals are contained in the administrative rules (OAR 141-085-0050 to OAR 141-085-0660).

DSL operates the Removal-Fill Program under legislative findings as follows:

> ORS 196.805
>
> *The protection, conservation and best use of the water resources of this state are matters of the utmost public concern. Streams, lakes, bays estuaries and other bodies of water in this state, including not only waters and materials for domestic, agricultural and industrial use, but also habitats for spawning areas for fish, avenues for transportation and sites for commerce and public recreation, are vital to the economy and well-being of this state and its people. Unregulated removal of material from the beds and banks of the waters of this state may create hazards to the health, safety and welfare of the people of this state. Unregulated filling in the waters of this state for any purpose, may result in interfering with or injuring public navigation, fishery and recreational uses of the waters. In order to provide for the best possible use of the water resources of this state, it is desirable to centralize authority in the Director of the DSL, and implement control of the removal of material from the beds and banks or filling of the waters of this state.*

ORS 196.668 contains numerous references to wetland values, including flood and storm damage protection, fish and wildlife habitat, water quality protection and enhancement and ecological research opportunities. The Legislature has also provided DSL with broad wetland planning mandates under ORS 196.672. These include: coordinating with local, other state and federal regulatory programs; use

of a single definition of wetlands and a uniform delineation methodology (DSL uses the 1987 Corps of Engineers Delineation Manual); development of a state-wide inventory of wetlands; maintenance of a stable resource base through mitigation; increase wetland resources by encouraging wetland restoration and creation; streamlining the regulatory process; continuing to meet the requirements of federal law; and develop and provide public information.

Compliance Monitoring and Enforcement

DSL conducts compliance monitoring and enforcement of its removal-fill program and documents the results. DSL's compliance monitoring efforts are designed to measure whether permitted projects are carried out in compliance with permit conditions. DSL seeks to enjoin unauthorized projects from proceeding. DSL may require remediation of any damage to jurisdictional resources and/or may impose civil penalties against violators.

DSL and the other resource agencies recognize the value of effectiveness monitoring. Under a cooperative program to jointly implement a State Programmatic General Permit (SPGP) with the Corps of Engineers, DSL and the Corps will be monitoring and evaluating the effectiveness of SPGP conditions in avoiding and minimizing impacts to the habitat of listed salmonids and all other listed species.

The State of Oregon has been expanding the removal-fill program since its inception in 1967. Throughout this time, DSL has maintained or improved its water resource conservation standards, while improving its customer service focus. This topic is addressed in more detail in the sections of this paper relating to the Department overview and removal-fill program description.

DSL has recently documented the results of its compliance monitoring, enforcement and permitting programs in summary reports published in 1997, 1999, 2000, 2003 and 2004 (in press). These reports present summary statistics for all aspects of the removal-fill program for the past twelve fiscal years (July 1, 1993 to June 30, 2004).

The overall compliance rate for removal-fill authorizations has recently increased. These improvements in compliance rates largely result from clearer standards in the removal-fill administrative rules, promoting greater internal consistency in permit conditions, and information provided to wetland consultants, public works departments and other applicants through workshops and the agency's website.

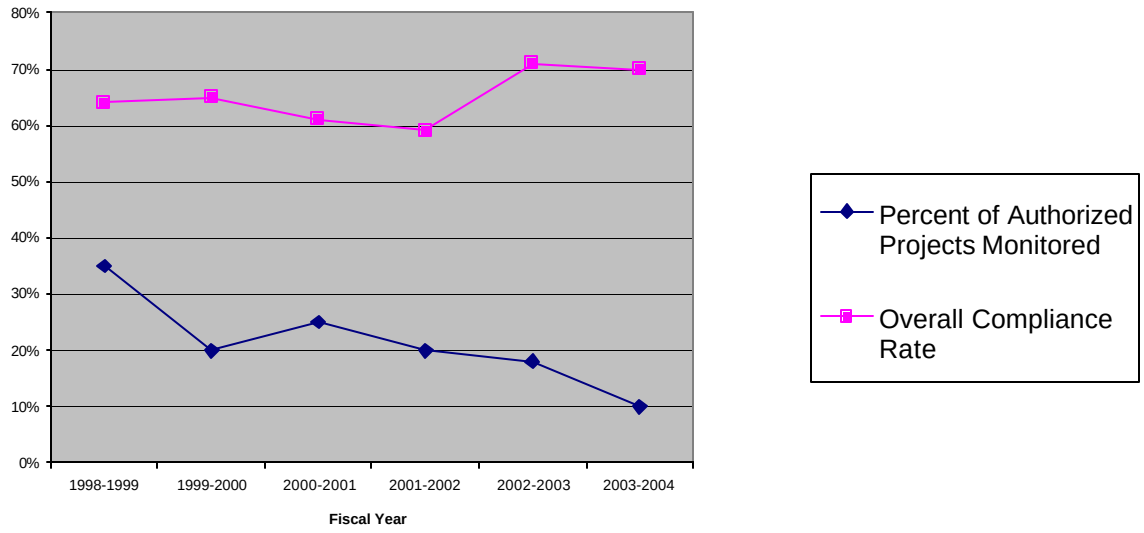
Table 2 and Figure 6 below summarize statewide permit compliance trends for the six fiscal years beginning in 1998 for the projects that DSL staff has monitored. In addition to its own compliance monitoring efforts, DSL receives and reviews wetland compensatory mitigation monitoring reports submitted by applicants and/or their consultants.
DSL received 241 monitoring reports in FY 2002-2003 and 247 monitoring reports in FY 2003-2004. During this reporting period, DSL reviewed these reports for compliance at random. At this writing, the results of these reviews are not available. Beginning in 2005, DSL has instituted a new policy and

assigned responsibility to staff to review 100% of the compliance monitoring reports submitted. Once an out of compliance project is detected, the Department works with the applicant to bring the project into compliance. Only when voluntary efforts prove to be ineffective, does DSL seek to compel compliance through formal administrative and legal procedures.

Table 2 and Figure 6. Statewide Compliance Monitoring Trends for DSL-Monitored Sites

Fiscal Year	Authorizations Issued*	Projects Monitored for Compliance*	Percent of Authorized Projects Monitored*	Overall Compliance Rate*
98-99	799	269	34%	64%
99-00	881	191	22%	65%
00-01	771	181	23%	61%
01-02	534	109	20%	59%
02-03	690	127	18%	71%
03-04	612	70	11%	70%
6-year averages	**715**	**158**	**21%**	**65%**

***NOTE: Recreational Placer Mining activities were not surveyed and therefore Placer Mining GAs are not included in these calculations.**



DSL must balance how much staff effort it expends on compliance monitoring vs. enforcement of unauthorized activities. DSL does expect to see an increase in the number of projects monitored under the SPGP program.

Under the Standard Operation Procedures for implementing the SPGP, the Corps and DSL will be conducting a statistically valid sampling program of SPGP-authorized projects. The Corps will conduct

compliance monitoring checks for 150 SPGP-authorized projects per calendar year. Additional compliance monitoring checks, if required, will be conducted by DSL. DSL/Corps will also conduct joint staff training so that SPGP monitoring personnel will obtain and process data correctly, accurately and consistently.

DSL has not compiled data on the elapsed time it takes staff to verify and authenticate a complaint. Removal-fill work that is actively occurring and is likely to be jurisdictional and have adverse environmental effects is assigned a high priority for investigation. In such cases, the alleged violation is usually investigated within a day or two of receipt of the complaint either by DSL, the Oregon State Police (OSP), or both. Activities that are completed and/or are on going but are determined to have a low risk of having adverse environmental affects are assigned a lower priority. For routine complaints, after DSL fills out a compliant/violation form and opens a file, it sends out a written notice to the landowner advising them that the removal-fill law may apply to the site in question. DSL keeps statistics on the outcome of all of its enforcement cases (see Tables 3 and 4, below).

Table 3: Enforcement Activities

	FY 2002-2003	FY 2003-2004
Status of Complaints in FY 02/03 & FY 03/04		
New Complaints Opened	396	287
Confirmed Violations	163	87
Status of Violation Cases in FY 02/03 & FY 03/04		
Closed---Mitigation performed by violator	5	9
Closed---Payment-to-Provide accepted	8	5
Closed--Site restored by violator	44	51
Closed--Permit granted	9	6
Closed—Activity exempt or under 50 Cubic Yard (CY) threshold	19	9
Closed—Non-jurisdictional water	5	4
Closed—Inconclusive facts or excessive backlog due to staff shortage	19	25
Adjudication in process (contested case or court action)	3	2
Open—Unresolved; carried into next FY	51	24
Violation Case Totals	163	87

Table 4 . Civil Penalties Assessed and Collected in FY 02-03 and FY 03-04

Fiscal Year 2002-2003

Violation #	Assessed	Paid	Uncollected
3418	175	175	0
3933	1,125	0	-1,125
4212	300	300	0
4457	2,500	2,500	0
4458	2,500	2,500	0
4591	375	375	0
4686	506	506	0
4691	1,266	1,266	0
4726	1,172	1,172	0
4754	52	0	-52
4755	2,500	2,500	0
4802	6,250	6,250	0
4804	844	0	-843.75
4808	375	375	0
4812	3,600	3,600	0
4813	675	675	0
4822	750	750	0
4832	1,687	14,781	13,094
4852	506	506	0
4857	150	150	0
4890	1,200	1,200	0
4931	3,600	3,600	0
Totals	**32,108**	**43,182**	**11,073.25**

Fiscal Year 2003-2004

Violation #	Assessed	Paid	Uncollected
1186	3,000	3,000	0
4886	600	600	0
4915	375	375	0
4917	1,200	1,200	0
4918	337.5	337.5	0
4928	21,600	21,600	0
4931	3,600	3,600	0
4958	1,200	1,200	0
4990	3,600	3,600	0
4997	150	150	0
4998	42,500	9,208	-33,292
5000	23,000	23,000	0
501	450	450	0

Totals	**101,613**	**68,321**	**-33291.7**

The agency strives to increase the public's awareness of program requirements through the statewide wetlands inventory, education and training programs for wetland consultants and other stakeholders. In general, these activities may increase compliance by making the public more aware of program requirements, answering questions and clearing up areas of confusion. DSL has also recently developed an enforcement manual to shorten the amount of time it takes to initiate a formal action, when necessary.

DSL's *2004-2008 Strategic Plan* calls for holding informational/training meetings for private wetland consultants and city and county staff members at least two times per year (more frequently if necessary). The Strategic Plan also calls for contacting organizations, such as local and state agencies, realtors, developers, economic development groups, homebuilders, contractors and natural resource conservation groups, to explore needs and opportunities for information and training sessions. DSL contacts statewide organizations representing these audiences by January each year to determine existing events or to create opportunities where information can be provided. DSL's goal is to increase the number of people reached by at least three percent annually.

Another example of DSL outreach is the new awards program with awards provided in three categories. Approved by the Land Board in December 2003, two of the categories relate to the Removal-Fill Permit Program: 1) Stream Project Award; and 2) Wetland Project Award. Winners were announced at the June 2004 Land Board meeting. The Stream Project Award was presented to Washington County for a fish passage improvement project. The Wetland Project Award was bestowed on two projects: the Mud Slough Wetland Mitigation Bank near Rickreall and Sodhouse Farms wetland restoration south of Burns.

Best Management Practices: Rule Revision

DSL has recently conducted a comprehensive review and updating of its permit conditions. DSL's Resource Coordinators, who review and issue permits and authorizations, refer to standard templates when conditioning projects. The coordinators are free to select from this list of conditions, make amendments and/or add other conditions as appropriate to adapt to site-specific circumstances. DSL also has been conducting Section 7 consultations with both Services (NOAA-Fisheries and USFWS) on the State Programmatic General Permit (SPGP). The outcome of these consultations will likely result in a new set of standard permit conditions to avoid adverse affects to listed anadromous salmonids and/or populations of USFWS-listed species or their habitat areas.

Gravel Mining Operations

Determining sediment budgets and bedload transport rates for all stream reaches with permitted aggregate mining operations is currently beyond the capabilities of DSL or its applicants, it is DSL's current practice to require gravel operators to submit data on the amount of material removed by these operators. There are currently 19 active sand and gravel operations in the ESU, all but 3 are bar scalping, were the operator works in the dry.

- Umpqua (9)
- Cow Creek (1)
- Coquille (3)
- Nehalem (1)
- Kilchis (2)
- Wilson (2)
- Trask (1)

DSL is interacting with the Independent Multidisciplinary Science Team (IMST) on this topic. For example, the IMST submitted a letter report to DSL dated July 31, 2002 addressing issues related to instream aggregate (gravel and sand) mining regulated by DSL in Oregon and how operations may affect salmonid populations. Pursuant to Executive Order No. EO 99-01, Section (3)(l), on June 11, 1999 DSL requested that the IMST review the study, entitled, "Gravel Disturbance Impacts on Salmon Habitat and Stream Health." The study was prepared for our agency as a result of the requirements of Senate Bill 81, Section 102, enacted by the Oregon State Legislature in 1993.

ORS 541.409 (3) provides as follows:

> *3) If the Independent Multidisciplinary Science Team submits suggestions to an agency responsible for implementing a portion of the Oregon Plan, the agency shall respond in writing to the team, explaining how the agency intends to implement the suggestion or why the agency does not implement the suggestion. The team shall include any agency responses in its report to the joint legislative committee created pursuant to ORS 171.551.*

On February 1, 2005, DSL responded to the IMST (see below), but the dialogue will not end here, DSL and the IMST will remain engaged on this topic.

IMST Recommendation 2. *DSL should develop and integrate a basin level approach into its management policies.*

Our general response is that collectively, under the Oregon Plan model, the state natural resource agencies are cooperatively collecting and analyzing data on a watershed scale. Basin level planning is a team exercise, and therefore more than one agency cannot manage alone. We believe that the state's

recent effort to develop an assessment of the Oregon Coast Coho ESU, following NOAA-Fishery's Policy to Evaluate Conservation Efforts (PECE) Analysis, is a good example. We think this cooperative study model is a good one, but implementing this IMST recommendation would require expanding DSL's jurisdiction legislatively. Such an initiative would require additional staff and unidentified funding.

IMST Recommendation 3. *DSL should determine sediment budgets and bedload transport rates on stream reaches with permitted aggregate mining operations.*

Instream mining impacts are difficult to evaluate because most stream systems, particularly in their lower reaches, have experienced cumulative, anthropogenic impacts that affect natural stream function. We also lack the financial resources to conduct these studies. Studying these relationships probably only is effectively accomplished on a case-by-case basis, at least in the near term. For this reason, we believe that our permit program is and will continue to conserve waters of the state in the manner contemplated by current state law. As more studies become available and new science is introduced into the policy realm, DSL will incorporate the results into its permit conditions.

IMST Recommendation 4. *DSL should track the actual amount of aggregate removal by permit holders.*

We were not consistent in requiring this data in the past, but it is DSL's current practice to require gravel operators to submit data on the amount of material they have removed. While determining sediment budgets and bedload transport rates for all stream reaches with permitted aggregate mining operations is currently beyond the capabilities of the Department or its applicants, it is DSL's current practice to require gravel operators to submit data on the amount of material removed by these operators.

The Department of State Lands applies certain standard conditions for bar scalping authorizations statewide. These sometimes include, but are not limited to, turbidity and erosion control standards, requirements for the proper handling of hazardous, toxic and waste materials, requirements for leaving 10-25 foot buffer strips between the operation and the water line at the time of the activity, and maximum depths set for material removal. Pre-removal surveys (conducted by a registered surveyor) are required within 30 days prior to beginning removal work, and a post-removal survey must be conducted immediately after completing the season's removal activities to assess recruitment/removal.

Statewide, there are currently about 50 active sand and gravel operations in streams in Oregon, including the South Umpqua, Willamette, Columbia, Chetco and Rogue Rivers. Nine applicants are currently going through the renewal process. Almost all of those are for bar scalping operations. Deep-water operations occur on the Umpqua, Willamette and Columbia.

On the Tillamook system, a mediated agreement is still in effect. In November 1991, well before the time of the Oregon Plan, the Oregon Department of Fish and Wildlife (ODFW) made the following request of the Department (Department) of State Lands:

> "…because of the critical status of Tillamook Bay chum salmon and the importance of gravel to their life-history…deny new permits or requests for renewal of existing permits for commercial gravel removal operation on the Nestucca, Trask, Wilson, Kilchis, and Miami rivers until it is demonstrated that the activity poses no negative impacts to chum salmon."

The following year, a multiparty mediated agreement was signed by state and local agencies and private industry (Mediated Agreement for Decision-Making Process for Extraction of Gravel from Tillamook County Rivers and Upland Sites). The agreement established, in part, that all commercial instream removal of gravel from the above referenced rivers would be terminated. As result, DSL has not authorized the removal of gravel for commercial purposes since the agreement was signed on October 1, 1997. Although at this writing there are two active DSL authorizations to remove gravel on the Kilchis, two on the Wilson, and one on the Trask, the removal was limited to erosion control only.

The Department of State Lands requires certain conditions for all bar scalping authorizations. These may include, but are not limited to, turbidity and erosion control standards, requirements for the proper handling for hazardous, toxic and waste materials, requirements for leaving 10-25 foot buffer strips between the operation and the water line at the time of the activity, and maximum depths set for material removal. Pre-removal surveys (conducted by a registered surveyor) are required within 30 days prior to beginning removal work, and a post-removal survey must be conducted immediately after completing the season's removal activities.

IMST Recommendation 5. *DSL, in cooperation with ODFW, should assess the cumulative impacts of aggregate mining on streams with declining salmonids.*

According to ODFW, when it reviews an instream gravel removal permit application, it considers whether the stream contains spawning, rearing and feeding habitat for listed sensitive, threatened or endangered fish species and it considers the sediment budget. That agency also says it does not typically recommend gravel removal in any specific area where salmonids spawn. This recommendation is based, in part, on the listing of numerous salmonid species as sensitive and/or threatened or endangered, the Oregon Plan, and recommendations in two prior reviews of gravel removal activities in Oregon (OWWRI, 1995, IMST letter report on gravel removal, 2002). ODFW's recent comments on gravel removal projects especially in the Willamette River system have reflected the IMST's recommendations to evaluate the cumulative impacts, sediment budget, and effectiveness monitoring of aggregate removal on a basin scale prior to issuing site-specific permits.

IMST Recommendation 6. *DSL should increase the technical expertise of geomorphology and hydrology within the agency.*

We agree that if sufficient funding were available we should increase the Department's technical expertise in fluvial geomorphology. Such expertise needed to determine how removal-fill operations may affect channel morphology. Adding this expertise to the Department's staff resources would also

help us to evaluate basin-scale and cumulative impacts. In future revisions to DSL's Strategic Plan, we will consider this recommendation again.

IMST Recommendation 7. *ODFW and DSL should identify critical salmonid migration routes not currently protected under the Essential Indigenous Salmonid Habitat (ORS 196.810(b); OARs 141-102-000 thru 0040) designation where impediments to migration could be occurring due to removal-fill activities.*

The Essential Indigenous Anadromous Salmonid Habitat (ESH) designation includes spawning and rearing, and rearing and migration corridors. Current law does not allow stream segments identified solely as migration corridors to be designated ESH. Fish passage obstructions are prohibited by law (ORS 498.351 and ORS 509.605) and are not allowed by DSL.

Fish passage problems are being investigated separately by the state. Please refer to Dent et al (2004), *A spatial evaluation of habitat access conditions in the coastal coho ESU and Oregon Plan fish passage improvement projects*, (contact Liz Dent for more information at (541) 929-9168)).

IMST Recommendation 8. *DSL and ODFW should develop an effectiveness monitoring program to determine if permit conditions under the Removal-Fill Law and General Authorizations maintain and protect salmonid fish habitat including gravel substrate, fish populations, and riparian conditions.*

DSL has approached ODFW on ways that the agencies could implement this recommendation. Talks are continuing and DSL will report back to the IMST periodically on progress.

IMST Recommendation 9. *State Land Board and DSL should develop an adaptive management process that is linked to the effectiveness-monitoring program.*

See response referenced above under *IMST Recommendation 8*, above.

IMST Recommendation 10. *DSL should incorporate both the technical aspects of the 1995 report, Gravel Disturbance and Impacts on Salmon Habitat and Stream Health, prepared by the Oregon Water Resources Research Institute into their operations and policies, and the recommendations in this report.*

DSL previously responded to the IMST's recommendations in the OWRRI report and commented on an earlier draft of IMST's July 31, 2002 letter report. This letter and our previous responses constitute our comments on IMST's Recommendations 1-10.

Essential Salmonid Habitat Designation

DSL has applied the Essential Salmon Habitat (ESH) designation to 17,917 stream miles (ORS 196.910 and OAR 141-102-0000). In total, the Essential Salmon Habitat designation applies to

approximately sixteen percent of Oregon's approximately 110,000 miles of rivers and streams (according to the 1:100,000 U.S. Geological Survey hydrologic base map used for the Essential Salmon Habitat mapping). The 50 cubic yard exemption does not apply in ESH, except for activities customarily associated with agriculture.

Interagency Coordination in Removal-Fill Permitting

DSL has signed Memoranda of Agreements (MOAs) with the Department of Environmental Quality (DEQ), the Oregon Department of Forestry (ODF) and the Oregon Department of Fish and Wildlife (ODFW). The overarching purpose of these state agency MOAs is to better integrate the respective state programs. The intent is to provide timely permit decisions by DSL to an applicant while assuring compliance with all applicable state laws .

DSL also has a signed MOA with the Corps to cooperate and share resources while implementing the Oregon Statewide Programmatic General Permit (SPGP). For example, under the DSL/Corps MOA, DSL/Corps have agreed to implement major regulatory program improvements, including:

- Tracking, evaluating and improving wetland mitigation success;
- Tracking, evaluating and improving permit compliance; and
- Refining the permit decision-making process through adaptive change based on analysis of project and mitigation data.

Regulatory Streamlining/Programmatic ESA Consultations

At this writing DSL is working closely with the Portland District Corps of Engineers (Corps) to finalize the State Programmatic General Permit (SPGP). The SPGP is a type of general permit that is issued by the Corps. Once issued by the Corps, certain minimal impact projects authorized by DSL that qualify for the SPGP will automatically fulfill all their state and federal permitting requirements (i.e., "one stop shopping").

National Oceanic and Atmospheric Administration (NOAA)-Fisheries has issued its programmatic biological opinion (BO)(SLOPES III). NOAA evaluated the SPGP as a proposed action under SLOPES III. The state and the Corps are working with the U.S. Fish and Wildlife Service (USFWS) to successfully conclude Section 7 consultation and resolve remaining Fish and Wildlife Coordination Act issues. The Department of Environmental Quality (DEQ) has completed its draft Clean Water Act Section 401 Certification for the SPGP. DSL and Corps are ramping up for SPGP implementation in 2005.

The State Land Board has introduced the following removal-fill program legislation to the 2005 Legislature.

HB 2130—Removal-fill permit fee increase; establish new fee for concurrence with wetland delineation reports

This bill would increase fees for the state's Removal–Fill Program, revise the fee structure to a more equitable schedule and grant a new authority to establish by rule a fee for the review and concurrence of wetland determination or delineation reports that are not accompanied by a permit application. Currently fees pay for less than 12-15 percent of the costs of the Removal-Fill Program. Additional support comes from statutory revenues into the Common School Fund. This revised fee structure would move the program towards being more self-supporting. HB 2082—Final approval for assumption of 404 program

This legislation would grant final approval to the Department to assume administration of the federal program set forth in Section 404 of the Federal Clean Water Act. The concept would make minor adjustments to statutory provisions identified as necessary to obtain federal authorization and changes necessary to complete the streamlining process.

Assumption of this federal program would eliminate duplicative state and federal permit requirements by combining state and federal removal–fill programs, provide more certainty to the public, and eliminate some federal processes for individual permits.

SB 170—Clarification of removal–fill statutory provisions

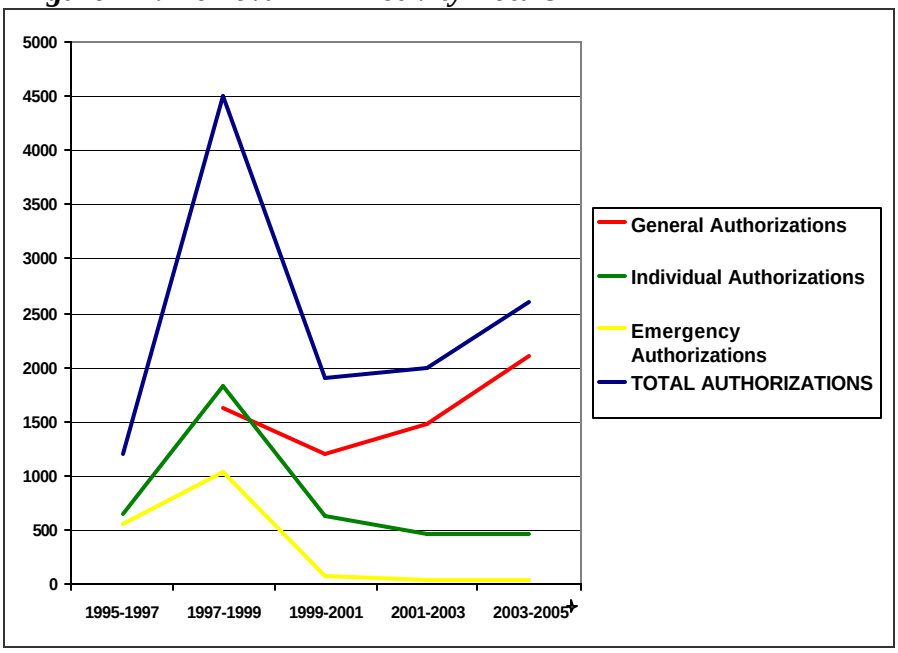
This bill would make a number of changes to the removal–fill statutes, some of which are of a housekeeping nature and others that are more substantive. The changes would include changing "Water Resources Commission" to "Department of State Lands" in ORS 196.840 and revising certain exemptions from permitting requirements in the Removal–Fill Program to more closely track those allowed under Section 404 of the federal Clean Water Act. The legislation would revise some exemptions. In addition, the bill would establish a rebuttable presumption that in certain instances, there is no practicable alternative and that off-site mitigation is acceptable without first considering on-site mitigation opportunities.

The bill also will allow DSL to enter into an interagency agreement with the Department of Environmental Quality to issue authorizations and enforce compliance with water quality standards established by the Environmental Quality Commission for placer mining.

Statewide Trends in Permits Issued

DSL issued 8,959 permits and authorizations statewide over the last 9 fiscal years (July 1 – June 30) with 7,758 of them being issued after the enactment of the Oregon Plan. There is an apparent trend beginning after the first two years of the Plan's existence that indicates a gradual decline in permits and authorization issued by the Department of State Lands. (See Figure 7).

Figure 7 : Removal-Fill Activity Totals



The only exception is within general authorizations where an increase in recreational placer mining activity starting around 2002. As shown in Table 5, this trend continues on through 2004 where a doubling of the previous year's activity seems to occur.

Table 5 : Gross Totals by Activity for General Authorizations (GAs)

General Authorizations					
Fiscal Years	1995-1997	1997-1999	1999-2001	2001-2003	2003-2005*
Tidegate			7	1	2
Fish Habitat Enhancement		452	403	329	128
Recreation Placer Mining		448	252	766	1564
Minimal Disturbance				5	38
Erosion Control		341	193	86	96
Removal Fill					2
Boat Ramp					2
Dock					24
Wetland Fill					2
Road		262	252	218	192
Wetland Enhancement		82	81	56	48
Unknown		45	23	29	
Subtotal		1630	1211	1490	2098

**2003-2005 Biennium GA data generated based upon trends in 2004 Fiscal Year. The purpose of Figure 7 and Table 5 is tracking general trends since 1995. Table 6 contains that actual data for FY 2002-2003 and FY 2003-2004.*

Summary of Removal-Fill Activities

DSL issued 2,504 permits and authorizations over the last two fiscal years (FY). **Table 5** shows, by category and fiscal year, the total number of each type of permit or authorization issued. **Table 7** shows authorizations issued in the ESU counties from 1997-2004.

Table 6: Statewide Authorizations in FY 2002-2003 and FY 2003-2004

Individual Permits	2002-2003	2003-2004
Boat Ramp	7	18
Channel Relocation	3	1
Dam Related	2	8
Dock	11	9
Erosion Control	11	12
Fiber Optic Cable	1	0
Fish Habitat	5	6
Commercial Gravel Removal	6	5
Maintenance Dredging	11	5
Marina	2	3
Pipeline/Cable/Utility	30	32
Roads/Bridges	42	29
Wetland Enhancement	2	1
Wetland Fill	64	71
Agricultural Drainage Ditch Maintenance	1	1
Other In-Water Work (multiple objectives)	74	8
Sub Total	**272**	**209**

General Authorizations	2002-2003	2003-2004
Fish Habitat Enhancement	172	136
Wetland Enhancement/Restoration	32	26
Fish & Wetland Enhancement and Restoration (combined)	0	9
Streambank Stabilization	53	51
Transportation-Related	138	104
Recreational Placer Mining	497	782
Sediment Removal Behind Tidegates	1	3
Minimal Disturbance (<2.0 CY)	6	26
Minor Impacts (< 0.1 acre)	0	1
Piling Placement	0	17
Sub Total	**899**	**1155**

Emergency Authorizations		
Erosion	10	13
Pipeline/Cable/Utility	1	2
Roads/Bridges	3	3
Dock	0	1
Sediment Removal Behind Tidegates	0	3
Other In-Water Work (multiple objectives)	2	8
Sub Total	**16**	**30**
Grand Total	**1187**	**1394**

Table 7. Authorizations Issued in ESU Counties (1997-2004)

Individual Permits	1997-2004
Boat Ramp	6
Channel Relocation	0
Dam Related	2
Dock	8
Erosion Control	41
Fiber Optic Cable	6
Fish Habitat	4
Commercial Gravel Removal	13
Maintenance Dredging	21
Marina	2
Pipeline/Cable/Utility	46
Roads/Bridges	57
Wetland Enhancement	0
Wetland Fill	66
Agricultural Drainage Ditch Maintenance	0
Removal-Fill	201
Sub Total	**473**
General Authorizations	
Fish Habitat Enhancement	737
Wetland Enhancement/Restoration	55
Fish & Wetland Enhancement and Restoration (combined)	0
Streambank Stabilization	177
Transportation-Related	252
Recreational Placer Mining	261
Sediment Removal Behind Tidegates	1
Minimal Disturbance (<2.0 CY)	10
Minor Impacts (< 0.1 acre)	6
Piling Placement	11
Sub Total	**1,504**
Emergency Authorizations	
Erosion	52
Pipeline/Cable/Utility	2
Roads/Bridges	17
Dock	0
Sediment Removal Behind Tidegates	0
Other In-Water Work (multiple objectives)	0
Sub Total	**71**
Grand Total	**2,048**

Compensatory Mitigation

Under OAR 141-085-0115, DSL may require compensatory mitigation as a condition of an authorization to compensate for reasonably expected adverse impacts to water resources of the state and navigation, fishing and public recreation uses on waters of the state other than freshwater wetlands or estuarine areas. Such compensatory mitigation may include, but is not limited to:

> (a) Offsite or onsite enhancement (e.g., planting or seeding riparian vegetation or exposing enclosed culverted systems) of water resources of the state;
> (b) Offsite or onsite improvements to enhance navigation, fishing or public recreation uses of waters of the state; or
> (c) Compensation to a third party, as approved by the Department, for the purpose of watershed health or to improve the navigation, fishing or public recreation uses of waters of the state. A permit holder, with the approval of the Department, may contract with a third party to construct, monitor or maintain the compensatory mitigation site.

The Department may approve of compensatory mitigation for impacts to waters of the state other than freshwater wetlands or estuarine areas, when the applicant demonstrates in writing that the compensatory mitigation plan will replace or

provide comparable substitute for water resources of the state and/or navigation, fishing and public recreation uses lost by project development.

DSL is not currently tracking all types of mitigation required for all projects in its LAS database. To date, DSL has focused its efforts on tracking compensatory mitigation for wetland impacts. DSL will continue to improve its database and track other types of compensatory mitigation as part of its overall program improvement efforts.

Compensatory Wetland Mitigation

DSL requires compensatory wetland mitigation for freshwater wetlands generally under OAR 141-085-0102 and for estuarine wetlands generally under OAR 141-085-0240. A total of 368 wetland-fill authorizations were issued statewide during the Fiscal years 2001-2004. Three hundred and fifty-five of these currently have, or had, mitigation projects. Two hundred and one of those projects required on-site compensatory mitigation. (see Table 8, below).

Table 8: Compensatory Wetland Mitigation Projects for Fiscal Years 2001-2004

Mitigation Type	*2001-2002*	*2002-2003*	*2003-2004*
On-Site Mitigation	19	101	81
PTP	15	26	40
Mitigation Bank	7	33	33
TOTALS	41	160	154

Examination of the type of compensatory mitigation used for these projects shows an exponential increase in the number of enhancement projects and a slight rise in the number of restoration projects while creation projects remained steady over the 3-year period.

Table 9 :Compensatory Wetland Mitigation Types

Fiscal Year	2001-2002	2002-2003	2003-2004
Mitigation Enhancement	61	83	261
Mitigation Restoration	20	32	47
Mitigation Creation	21	58	58
TOTALS	**102**	**173**	**366**

Compensatory Mitigation: Payment to Provide Totals

Governor Kitzhaber's Executive order No. EO 99-01 states that the goal of the Oregon Plan is to restore Oregon's wild salmon and trout populations and fisheries to sustainable and productive levels that will improve water quality and to provide substantial environmental, cultural, and economic benefits. One mechanism available to aid in achieving these goals is the Oregon Wetland Mitigation Bank Revolving Fund accounts. Wetland Payment-to-Provide (PTP) is a form of compensatory wetland mitigation allowed by the Department through the removal fill permit process when other methods of compensatory wetland mitigation are not available.

As a condition of an authorization, DSL may require compensatory mitigation to compensate for reasonably expected adverse impacts to water resource of the state (OAR 141-085-0115 (1)). Since the enactment of the Oregon Plan, PTP payments have increased. As we stated earlier under, **Wetland Trends in the Ecologically Significant Unit (ESU)**, DSL funded one project in the ESU in FY 2002-2003 with PTP funds from the Wetland Mitigation Bank Revolving Fund. DSL disbursed $45,500 to the North Coast Watershed Association for a coho habitat enhancement in Johnson Slough, a tributary to the Lewis and Clark River. The project will remove and replace a tidegate; opening up approximately 7 miles of spawning habitat and 1.5 miles of estuarine rearing habitat.

Conclusion

The estimated total acres of wetland in the ESU converted to other uses, from 1850-2000, was 43,672 acres. The 43,672 acre total includes the following: 1) freshwater wetland-34,276; 2) lacustrine (lake associated) wetlands-13 acres; 3) salt marsh-9,383; and 4) subtidal habitat-0. DSL recently reported to the Oregon Progress Board wetland gains and/or losses that could be attributed just to the removal-fill regulatory program statewide. Oregon Benchmark 77 measures the gain/or loss of wetland acreage per year. For the four years spanning FY 01 through FY 04, there was a gain of 330 acres of freshwater wetland, and a net gain of 10 acres of estuarine wetland. On balance, taking into account DSL regulatory data and OWEB restoration project data, the trend in the ESU appears to be consistent with statewide goals of no net loss in freshwater wetland area, and a net gain in estuarine wetland. Note that these data do not provide ecological information on the functions of the wetlands lost vs. functions of the wetland accepted as mitigation, restored from uplands to wetlands, or converted from one wetland type to another. Converting one wetland type to anther does not result in a net gain of total wetland area. The data do not provide information about the significance of any of these wetland changes for coho. More detailed studies would be required to address these types of questions.

APPENDIX I

(Department of State Lands Factors for Decline Report)

ESTIMATED LOSS OF SALT MARSH AND FRESHWATER WETLANDS WITHIN THE OREGON COASTAL COHO ESU

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SUMMARY

Acreage of wetland conversions are calculated for 31 population units of the Oregon coastal coho ESU. Table 1 shows acreages for freshwater wetlands, lacustrine wetlands, salt marsh, and subtidal (salt and freshwater) wetlands, stratified by population units. Acreage in 1850 is compared to existing acreage and change is calculated for each type. Change ranges from zero in smaller population units, although up to 2,499 acres in the Tahkenitch unit, to very large conversions in the Coquille (91% total conversion). In other units such as the Coos and Tillamook, changes are very large for certain wetland types but low for others. In general, losses are greatest for freshwater wetlands, less for salt marsh, and negligible for lacustrine and subtidal wetlands.

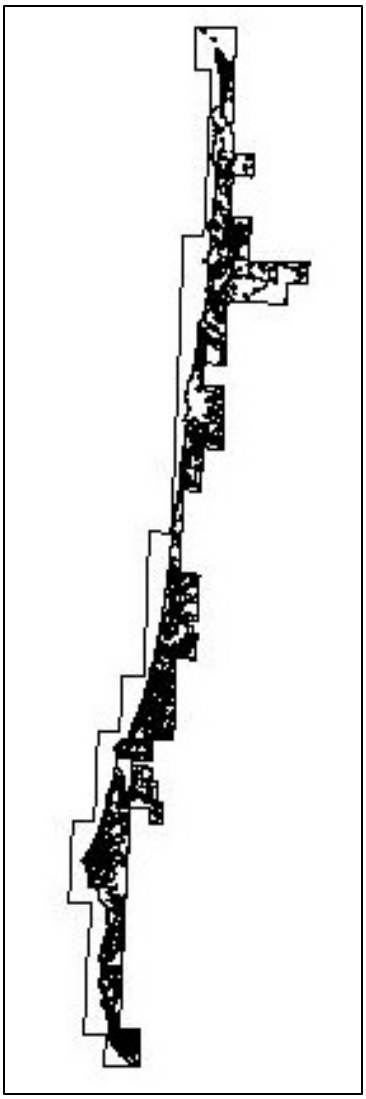
INTRODUCTION

Figures for losses of tidal wetlands in Oregon's estuaries were compiled by Good (2000), but similar figures for freshwater wetlands are not available. Digital mapping by the National Wetlands Inventory (NWI) is useful for calculating total wetland acreage and Cowardin wetland type, but it cannot be used for identifying converted wetlands because many converted wetlands are not classified as such. This report is a first estimation of freshwater losses for the coast, based on analysis of historic vegetation, hydric soils, and 1990's digital orthophotography.

Definitions

It is sometimes difficult to determine the extent of wetland alteration based on remote sensing. "Loss" implies permanent removal of wetlands, but many are in fact restorable and the status of most wetlands can be scored based on the relative amount of conversion to other uses. Obvious conversions include filled and urbanized land, and land currently farmed. Obvious reversions to wetland are visible on

abandoned farm or pasture land restocking with native vegetation and some amount of nascent multilayered structural complexity. Land in the early stages of abandonment is the most difficult to assess from remote sensing. For the purposes of this project, a wetland was scored as fully converted if its vegetation appeared to be different from what would be expected in a relatively undisturbed wetland.



Methods

The primary source used for historical wetland data for the Oregon coast was Hawes et al. (2000). This is a GIS dataset developed by the Oregon Natural Heritage Information Center (ORNHIC), based on vegetation data recorded in General Land Office (GLO) survey notes dating from approximately 1855-1880. This cover delineated historical vegetation extending 1 to 15 miles inland from the coast. Coverage up the Coquille River was extended to river mile 47 by crosswalking vegetation attributes, digitizing, and appending a map of the historical vegetation of the Coquille River valley (Benner 1992). Benner's work was also based on GLO survey notes and her mapping methods were nearly identical to those of ORNHIC, so the two products were compatible. The combined covers delineate historical vegetation patterns for the entire coast at a scale of 1:24,000 (Figure 1).

The second step was to extract a wetland polygon cover from the combined GLO covers. Because certain riparian and prairie polygons in the historical cover contained undifferentiated upland and wetland components, hydric soil polygons from NRCS digital soil data were used to clip wetland portions of these vegetation types, and the clipped portions were added to the historical wetland cover. Digital soil data were not available for Tillamook County, so paper maps were used to manually edit the historical cover as needed to reflect hydric soils.

The ODFW coastal coho population unit cover was then used to clip the historical wetland polygon cover to conform with the coho study area. The population unit polygons were then used to stratify the wetland data by population unit (Table 1).

The wetland cover was then overlaid on digital orthophotoquads and the two layers compared visually to identify losses. Each polygon was scored as being either completely converted, partially converted, or unconverted. Unconverted polygons included not only obviously undisturbed sites, but also those visibly or known to have had restoration activity (e.g., dikes breached, ditches filled, etc.), and abandoned agricultural sites that were evidently reverting to structurally complex native vegetation. A visible shrub layer is evidence of recovering structural complexity.

Currently, few resources are available to demarcate salt marsh from freshwater wetlands in Oregon's estuaries. The breakpoint between salt marsh and fresh marsh is a moving target regulated by seasonal river flows, tides, channel depths, degree of mixing, and salinity tolerances of marsh vegetation. No one has mapped the breakpoint based on vegetation, and it has also probably moved upstream over time because of flood control, channel dredging, and diversion of freshwater for agricultural, industrial, and urban uses. Digital estuarine habitat maps from the Oregon Estuary Plan Book (Cortright et al. 1987) distinguish between salt marsh, fresh marsh, and shrub (freshwater), but coverage extends upstream to fresh marsh in only 3 of the 17 estuaries included in the book. Digital maps depicting average annual salinity zones for 12 of Oregon's estuaries (NOAA 1999) distinguish fresh from salt water (0-0.5 psu) in 7 of the 12 estuaries included in the coverage. Upstream limits of salt intrusion in 17 Oregon estuaries, obtained from a variety of LCDC and ODFW documents published in the 1970's, fell within 2-8 miles of the salt water-freshwater breakpoint depicted on the NOAA cover, and were usually farther upstream. Personal knowledge of the breakpoint in some estuaries was closer to the NOAA data than the data on upstream salt intrusion, so I used the NOAA data as the best available approximation for the salt marsh-fresh marsh break. This was supplemented by fresh marsh and shrub polygons when available from the Oregon Estuary Plan Book, and shrub and Sitka spruce swamp polygons from the historic vegetation cover, all of which were interpreted as freshwater wetlands.

Limitations

The figures in Table 1 are not congruent with those of Good (2000) because of differences in mapping tidal wetlands and boundaries of the two study areas. GLO surveyors extended their surveys only to the edge of high tide, effectively delineating the boundaries of high salt marsh and excluding most areas of low salt marsh and subtidal lands. GLO surveyors also did not describe or delineate deflation plain wetlands, in most cases because they did not exist in the days before dune stabilization programs. Figures used in this report therefore underestimate the total extent of intertidal emergent marsh and deflation plain wetlands, and total acreages are somewhat lower than what are available from NWI maps. The actual amount of low salt marsh lost to development may be relatively small, and may have been offset to some extent by accretion of mud flats and low salt marsh in some estuaries since 1900 (Johannessen 1964). The areas delineated by the GLO surveyors probably best represent most lands deemed usable for agriculture and urban development, and hence would give a good approximation of areas impacted. Secondly, this report includes all wetlands identified by the GLO record, regardless of estuarine or tidal affinity, and extends as far as 47 miles up some river valleys.

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Table 1. Extent of historical wetlands in Oregon estuaries, based on General Land Office survey notes, and estimated losses to other uses, by coho population unit.

Coastal coho population unit	Freshwater wetland or salt marsh	Wetlands, 1850		Change since 1850		Existing wetlands	
		Acres	% of historical acres	Acres changed	% change by type	Acres	% of existing acres
Alsea	freshwater	41	1	-41	-100	0	
	salt marsh	617	21	-232	-38	385	
	subtidal	2,218	77	0	0	2,218	
	total	2,876	100	-273	-10	2,603	
Beaver	freshwater	232	44	-232	-100	0	
	salt marsh	269	51	0	0	269	
	subtidal	31	6	0	0	31	
	total	532	100	-232	-44	300	
Cape Arago	freshwater	26	100	-21	-81	5	
	salt marsh	0	0	0	0	0	
	total	26	100	-21	-81	5	
Carter Lake	lacustrine	38	100	0	0	38	
	salt marsh	0	0	0	0	0	

	total	38	100	0	0	38	
China Creek	freshwater	358	100	0	0	358	
	lacustrine	1	0	0	0	1	
	salt marsh	0	0	0	0	0	
	total	359	100	0	0	359	
Coos	freshwater	4,565	22	-2,359	-52	2,206	
	lacustrine	109	1	0	0	109	
	salt marsh	2,560	12	-2,363	-92	197	
	subtidal	13,810	66	0	0	13,810	
	total	21,044	100	-4,722	-22	16,322	
Coquille	freshwater	13,785	82	-13,784	-100	1	
	lacustrine	12	0	0	0	12	
	salt marsh	1,571	9	-1,554	-99	17	
	subtidal	1,419	8	0	0	1,419	
	total	16,787	100	-15,338	-91	1,449	
Depoe Bay	freshwater	88	100	-69	-78	19	
	salt marsh	0	0	0	0	0	
	total	88	100	-69	-78	19	
Devils Lake	freshwater	391	38	-192	-49	199	
	lacustrine	645	62	0	0	645	
	salt marsh	0	0	0	0	0	
	total	1,036	100	-192	-19	844	
Ecola	freshwater	304	92	-70	-23	234	
	salt marsh	15	5	-8	-53	7	
	subtidal	11	3	0	0	11	
	total	330	100	-78	-24	252	
Floras	freshwater	3,867	77	-3,296	-85	571	
	lacustrine	1,176	23	0	0	1,176	
	salt marsh	0	0	0	0	0	
	total	5,043	100	-3,296	-65	1,747	
Lower Umpqua	freshwater	2,515	22	-2,162	-86	353	
	salt marsh	1,252	11	-658	-53	594	
	subtidal	7,571	67	0	0	7,571	
	total	11,338	100	-2,820	-25	8,518	
Necanicum	freshwater	1,944	83	-850	-45	1,094	
	lacustrine	233	10	0	0	233	
	salt marsh	0	0	0	0	0	
	subtidal	153	7	0	0	153	
	total	2,330	100	-850	-37	1,480	
Nehalem	freshwater	2,260	39	-1,774	-79	486	
	lacustrine	52	1	-13	-25	39	

	salt marsh	853	15	-694	-81	159	
	subtidal	2,681	46	0	0	2,681	
	total	5,846	100	-2,481	-42	3,365	
Neskowin	freshwater	259	92	-130	-50	129	
	lacustrine	24	8	0	0	24	
	salt marsh	0	0	0	0	0	
	total	283	100	-130	-46	153	
Nestucca	freshwater	1,459	44	-1,062	-73	397	
	salt marsh	584	18	-549	-94	35	
	subtidal	1,287	39	0	0	1,287	
	total	3,330	100	-1,611	-48	1,719	
Netarts	freshwater	748	16	-748	-100	0	
	lacustrine	20	0	0	0	20	
	salt marsh	781	17	0	0	781	
	subtidal	3,155	67	0	0	3,155	
	total	4,704	100	-748	-16	3,956	
Rockaway	freshwater	37	13	-22	-60	15	
	lacustrine	240	87	0	0	240	
	salt marsh	0	0	0	0	0	
	total	277	100	-22	-8	255	
Salmon	freshwater	436	29	-217	-50	219	
	salt marsh	889	58	-232	-26	657	
	subtidal	197	13	0	0	197	
	total	1,522	100	-449	-30	1,073	
Seal Rock	freshwater	33	70	0	0	33	
	lacustrine	14	30	0	0	14	
	salt marsh	0	0	0	0	0	
	total	47	100	0	0	47	
Siletz	freshwater	1,389	39	-254	-18	1,135	
	salt marsh	874	25	-664	-76	210	
	subtidal	1,269	36	0	0	1,269	
	total	3,532	100	-918	-30	2,614	
Siltcoos	freshwater	1,150	20	-630	-55	520	
	lacustrine	4,460	80	0	0	4,460	
	salt marsh	0	0	0	0	0	
	total	5,610	100	-630	-11	4,980	
Siuslaw	freshwater	1,534	30	-1,012	-66	522	
	lacustrine	341	7	0	0	341	
	salt marsh	385	7	-51	-13	334	
	subtidal	2,924	56	0	0	2,924	
	total	5,184	100	-1,063	-21	4,121	

Sixes	freshwater	406	66	-212	-52	194	
	salt marsh	0	0	0	0	0	
	subtidal	209	34	0	0	209	
	total	615	100	-212	-35	403	
Tahkenitch	freshwater	223	9	0	0	223	
	lacustrine	2,276	91	0	0	2,276	
	salt marsh	0	0	0	0	0	
	total	2,499	100	0	0	2,499	
Tenmile	freshwater	3,037	51	-2,072	-68	965	
	lacustrine	2,941	49	0	0	2,941	
	salt marsh	0	0	0	0	0	
	total	5,978	100	-2,072	-35	3,906	
Thiel Creek	freshwater	23	100	-12	-52	11	
	salt marsh	0	0	0	0	0	
	total	23	100	-12	-52	11	
Threemile Creek	freshwater	53	36	0	0	53	
	lacustrine	96	64	0	0	96	
	salt marsh	0	0	0	0	0	
	total	149	100	0	0	149	
Tillamook	freshwater	3,064	21	-2,820	-92	244	
	salt marsh	1,239	9	-1,065	-86	174	
	subtidal	10,035	70	0	0	10,035	
	total	14,338	100	-3,885	-27	10,453	
Yachats	freshwater	353	51	0	0	353	
	lacustrine	338	49	0	0	338	
	salt marsh	0	0	0	0	0	
	total	691	100	0	0	691	
Yaquina	freshwater	357	6	-235	-66	122	
	salt marsh	1,800	28	-1,313	-73	487	
	subtidal	4,254	66	0	0	4,254	
	total	6,411	100	-1,548	-24	4,863	

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