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March 20, 2014

Joelle Gore, Acting Chief
Coastal Programs Division (N/ORM3)
Office of Ocean and Coastal Resource Management, NOS, NOAA
1305 East-West Highway
Silver Spring, Maryland 20910
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RE: EPA and NOAA's notice of intent to find that Oregon has failed to submit an approvable coastal nonpoint program

Dear Ms. Gore,

The State of Oregon is providing the attached submittal in response to EPA and NOAA's notice of intent to disapprove Oregon's coastal nonpoint program under the Coastal Zone Act Reauthorization Amendments based upon perceived deficiencies in Oregon's program. Those findings were based on Oregon's program as it existed in July 2013. The notice also identified the specific deficiencies and described what Oregon would need to do to have an approvable program.

EPA and NOAA's proposal to disapprove Oregon's program, if made final, will result in the federal agencies withholding millions of dollars of grant money from Oregon under the Coastal Zone Management Act and Clean Water Act. CZMA Section 306 grants enable the Oregon Department of Land Conservation and Development to provide funding and technical assistance to coastal communities struggling to adapt to sea level rise and natural hazards, among other threats. CWA Section 319 grants fund DEQ staff members who work with landowners and local communities to design and implement water quality improvement projects, and the funding is also passed through as grants to local groups to help pay for nonpoint source pollution projects.

The State of Oregon addresses EPA and NOAA's concerns regarding Oregon's coastal nonpoint program with the additional and revised measures described in the attached submittal. With this submittal, we contend that Oregon's program conforms with EPA's Section 6217(g) guidance and with the agencies' direction to adopt additional measures under Section 6217(b)(3), and therefore EPA and NOAA can and should approve Oregon's program. A decision to disapprove Oregon's program is not justified and would be inconsistent with the agencies' interpretation and application of the CZARA program in other states. Accordingly, such a decision would be arbitrary and capricious.

EPA and NOAA's public notice also invited comments regarding the adequacy of Oregon's programs and

policies for meeting the 6271(g) agricultural management measures. This submittal includes an update on significant changes to Oregon's agriculture program since receiving interim approval in 2004, and also addresses each of the concerns raised by the federal agencies about Oregon's agriculture program.

With the additional measures described in the attached submittal, we believe that Oregon has provided what is needed for EPA and NOAA to approve these measures and Oregon's coastal nonpoint program. We look forward to your response, and to continuing to work with EPA and NOAA to ensure the protection of Oregon's coastal lands and waters.

Sincerely,

Dick Pedersen, Director
Oregon Department of Environmental Quality

Jim Rue, Director
Oregon Department of Land Conservation and Development

cc: Christine Psyk, EPA Region 10
Jayne Carlin, EPA Region 10
Richard Whitman, Oregon Governor's Office
Katy Coba, ODA
Doug Decker, ODF

Oregon's Submittal for the Remaining CZARA Additional Management Measures

March 20, 2014

On December 20, 2013, the National Oceanic and Atmospheric Administration (NOAA) and the Environmental Protection Agency (EPA) published notice of intent to disapprove Oregon's Coastal Nonpoint Pollution Control Program under the Coastal Zone Act Reauthorization Amendments (CZARA) based on Oregon's program as it existed in July 2013. The notice also identified the specific deficiencies and described what Oregon would need to do to have an approvable program. These perceived deficiencies related to water quality impacts from forestry, septic systems, and new development.

In addition, EPA and NOAA's public notice invited comments regarding the adequacy of Oregon's programs and policies for meeting the 6271(g) agricultural management measures.

This submittal addresses each of the concerns raised by the federal agencies and also includes an update on significant changes to Oregon's agriculture program since receiving interim approval in 2004.

Urban Areas Management Measure – New Development

EPA and NOAA Findings

Based upon their review of materials submitted by Oregon as of July 1, 2013, EPA and NOAA determined that the following would be needed to be addressed for Oregon's program to satisfy the 6217(g) guidance regarding new development in urban areas:

- DEQ's *Urban and Rural Residential Designated Management Agencies for Including Post-Construction Elements in TMDL Implementation Plans* "must be final and operational."

- "develop a proactive outreach and training strategy to promote the guidance and implementation of the new development measure throughout the coastal nonpoint management area."

- "commit to taking formal regulatory action to require the implementation of the new development management measure where needed when the voluntary approach does not result in good faith efforts to achieve the management objective within a reasonable time frame (e.g., five years from finalization of the TMDL implementation plan)."

The purpose of this management measure is four-fold: (1) decrease the erosive potential of increased volumes and velocities of stormwater associated with development-induced changes in hydrology; (2) remove suspended solids and associate pollutants entrained in runoff that result from activities occurring during and after development; and (4) preserve natural systems including in-stream habitat.

Oregon's Response

Oregon will meet the New Development Management Measure through a combination of voluntary and regulatory programs. The voluntary program will be implemented by DEQ through its TMDL implementation guidance and the regulatory program will be implemented by DEQ under its permitting authorities.

Voluntary Program

DEQ has issued its "Guidance to Urban and Rural Residential Designated Management Agencies for Including Post-Construction Elements in TMDL Implementation Plans." The target audience for this guidance includes DMAs that are subject to a Water Quality Management Plan with post-construction-stormwater management identified as a load reduction strategy, and for DMAs that determine through their own methods that development of a post-construction stormwater management program is necessary to meet a TMDL load allocation. The guidance focuses on the creation of a local program to address site-specific runoff from urban development. The guidance is available on DEQ's website at: http://www.deq.state.or.us/wq/tmdls/docs/TMDLguidance.pdf

DEQ will roll out this guidance with a two-phase outreach and education strategy. The first phase involves training for DEQ staff (e.g., TMDL, permit, 319, SRF, enforcement) and the second phase involves outreach and education for the public and potentially affected communities and DMAs. The following is an outline of strategy components and estimated schedule.

- Issue guidance and post on DEQ's website (March 2014)
- Training for DEQ staff training (June-December 2014)
- Develop outreach curriculum (June-December 2014)
- Identify partners/and communities needs; design outreach plan (September-December 2014)
- Conduct 4-5 public informational meetings in CZARA basins (January/February 2015)
- One-on-one meetings with DMAs/permittees during TMDL/WQMP development and implementation (2015 through 2019)

DEQ has a system in place to track DMA assignments, TMDL implementation plan approval, TMDL plan implementation, and compliance. The overall target to address and implement the CZARA New Development Management Measure within the 6217 management area using the TMDL approach is 5 years, with the potential for an additional 5 years from the date of TMDL approval for any yet-to-be completed urban runoff TMDLs. This will allow for DMAs to incorporate, develop, and implement appropriate management strategies. DEQ will encourage implementation strategies that utilize the 319 grant fund, State Revolving Fund (Green Project Reserve program) and other innovative funding programs, and incorporate this message in the outreach strategy.

Back-up Enforcement Authority

If the voluntary approach described above does not achieve the management measure's objective within a reasonable time frame (e.g., five years from finalization of the TMDL implementation plan), DEQ will use its regulatory authority to accomplish that objective. Specifically, DEQ will use one or more of the following options.

One option is to develop and implement a post-construction general permit. Under this approach, urban land development that creates impervious surfaces like road, houses, or parking lots, would be required to obtain coverage under a post-construction general permit. The post-construction general permit will require all development to meet permit specific permit conditions that ensure the performance standards (hydrology, TSS reduction) are addressed. The general permit will align (or potentially combine) with Oregon's existing construction site runoff NPDES general permit (1200-C/CN) that addresses erosion and sediment control during active construction. DEQ will accomplish this either through its permitting authority [ORS 468B.050] or by requesting that the EQC adopt a rule requiring these permits [ORS 468B.020].

Another option is to develop a rule that adopts post-construction stormwater program

requirements and performance standards, which could include techniques such as Low Impact Development or Green Infrastructure. This approach would require adoption of the rule by the Environmental Quality Commission [ORS 468.020; 468B.020; and 468B.110].

A third approach is to designate the local government as an MS4 [40CFR (122.26)] and regulate them under the NPDES stormwater permit program [ORS 468B.035]. This will meet the objectives of the guidance, although, per federal policy, this designation and the accompanying enforceable permit requirements would remove this element from coverage under the program.

If the voluntary approach is not successful, DEQ will take formal regulatory action to require a DMA to implement the new development management measure after evaluating the options described above and potentially other regulatory options that become available to DEQ between now and then, to determine the most appropriate approach or approaches to implement.

Operating onsite sewage disposal systems (OSDS) management measure

EPA and NOAA Findings

Based upon their review of materials submitted by Oregon as of July 1, 2013, EPA and NOAA determined that the following things would need to be addressed for Oregon to satisfy the 6217(g) guidance for management measures relating to onsite sewage disposal systems:

- "describe methods for tracking and evaluating the voluntary program."
- "commit to using its back-up enforcement authority to implement the OSDS management measure in case tracking shows that the voluntary approach falls short of achieving the objective of this measure."

The objective of the OSDS management measure is to minimize nonpoint source pollution from operating OSDS.

Oregon's Response

DEQ satisfies this management measure with its comprehensive regulatory OSDS program and a voluntary time of transfer inspection program. If the time of transfer program, in conjunction with other DEQ efforts aimed at proactively identifying and addressing OSDS contributing to nonpoint source pollution, does not meet the objective of this measure DEQ will propose rules requiring time of transfer inspection for adoption by the Environmental Quality Commission.

Regulatory Program

Under Oregon Administrative Rules 340-071, DEQ regulates the installation, repair, and alteration of OSDS through a permitting process. The standards require that OSDS be placed only in suitable areas where adequate protective setbacks and distance to groundwater tables can be met. The rules also explicitly define licensing and certification requirements for OSDS installers, maintenance providers, and inspectors. In order to be approved as an OSDS inspector, an individual must maintain current certification as an installer, maintenance provider, National Association of Wastewater Technicians inspector, professional engineer or environmental health specialist, and must also have experience inspecting existing OSDS. Certification status is verified monthly.

All certified and approved OSDS inspectors are required to use DEQ's Existing System Evaluation Report form when disclosing results from an OSDS inspection (OAR 340.071.0155). The ESER form is comprehensive and requires information that includes, but is not limited to: identification of sewage discharge to surface or ground waters; verification that a permit and a design plan does or does not exist for the OSDS system; any discrepancies between the design plan and the existing system; submittal of maintenance contracts, maintenance records and history of repairs; and general description of the condition of all system components including the drainfield. The ESER form must be presented to the client upon completion of the

inspection. The ESER and requirement to use it resulted from rules adopted by the Environmental Quality Commission in 2013. As part of the new ESER reporting process, DEQ is developing a training class for OSDS inspectors.

In addition, under Oregon's TMDL authorities, if a water quality impairment can be traced back to failing OSDS or the inability of the local soils or groundwater to handle existing onsite systems, these problems will be addressed as part of a TMDL. Onsite systems will be assigned a load allocation and entities having authority over OSDS will be required to develop and implement a TMDL implementation plan to meet their TMDL and Water Quality Management Plan responsibilities.

Voluntary Program

During 2013, DEQ worked with the Oregon Association of Realtors (OAR) on a statewide initiative to promote OSDS inspections at the time of property transfer. While time of transfer inspections are voluntary, submittal of a Seller's Disclosure Statement to property buyers prior to transfer of real property is mandatory (ORS 105.464). The contents of the Seller's Disclosure Statement are set in statute, and during the 2013 Oregon legislative session DEQ worked with OAR to augment the section which pertains to OSDS. Answers to descriptive OSDS questions, as well as supporting materials specific to OSDS inspection, maintenance and repair, must be provided to the buyer prior to closing (ORS 105.464). This information will raise awareness of OSDS issues and prompt the buyer to obtain an OSDS inspection as part of the real estate transaction.

Another outcome of the collaboration between DEQ and OAR was a Memorandum of Understanding (attached) that commits both organizations to a variety of outreach and educational efforts related to OSDS. For example, DEQ and OAR are providing OSDS classes to each of Oregon's 30 Realtor® Associations to encourage time of transfer OSDS inspections and provide information on proper OSDS operation and maintenance. This class is available as a webinar for Associations that cannot accommodate an in-house OSDS class. The target for Realtor® outreach is to provide a class to all 30 Associations by June 2015. As of February 2014, 37% of Associations have hosted an in-house OSDS class and an additional 20% have scheduled an in-house class within the 2014 calendar year. OAR and DEQ will also approach the Oregon Real Estate Agency about including the OSDS curriculum in the Law and Rule Required Course – a mandatory class that all brokers in Oregon must attend in order to maintain their real estate broker license (ORS 696.174 and OAR 863-022-0055). Additionally, articles published in the Oregon Real Estate Journal and Local Focus (official journal for the League of Oregon Cities) will encourage local governments to partner with DEQ to pursue OSDS initiatives.

The MOU also resulted in the establishment of the Oregon Septic Smart program. The objective of this program is to educate Oregonians about the importance of septic systems, septic system inspections and proper septic system maintenance. DEQ maintains a Septic Smart webpage that includes information for both realtors and home buyers and sellers, and also includes a list of certified industry professionals that perform septic system inspections. Approved OSDS

inspectors that want to be listed on DEQ's Oregon Septic Smart webpage must participate in the Oregon Septic Smart program. DEQ is conducting outreach to the industry, including a presentation at the Oregon Onsite Wastewater Association annual conference in March 2014, to inform industry professionals about Septic Smart and encourage them to participate. Participation in Oregon Septic Smart is voluntary, but in order to maintain eligibility for Oregon Septic Smart all approved inspectors must 1) give evidence that all certification requirements are up to date, and 2) submit an annual report which identifies their inspection activities during the previous calendar year. Annual reporting activities will be discussed in a following section. The combination of these efforts will contribute to the success of the voluntary time of transfer program. Success will be evaluated against the target described below.

Tracking Mechanism

Based on County Assessors' records for the calendar year 2013, property transfers total approximately 20,000 in Oregon's counties in the 6217 management area. Roughly half of these property transfers represent a residential property sale. A GIS analysis conducted by DEQ in 2012 found that 40% of residential properties are serviced by OSDS. If this holds true for the coastal counties, that would mean that about 4,000 home sales a year may include an OSDS and would be candidates for a time of transfer inspection.

However, it is reasonable to assume that an inspection would not be warranted for every property transfer involving an OSDS. For example, systems that are required to have annual maintenance and systems that have recently been inspected and determined to be high functioning may not warrant an inspection[1]. A survey of counties conducted by DEQ for 2009 indicates that approximately 29% of OSDS that were permitted in the coastal counties were alternative treatment technologies (ATTs). At the time this survey was conducted, owners of ATT systems were required to maintain an annual service maintenance contract with a certified Maintenance Provider and submit an annual report. Since 2009, this requirement has been extended to owners of sand filter, gravel distribution and pressure distribution systems (OAR 340.071.130). Based on these data, a conservative estimate is that approximately 10% of the 4,000 residential home sales in coastal counties include homes with OSDS that are serviced on an annual basis. There remain approximately 3,600 homes sales a year in the coastal counties that include an OSDS that may not be inspected on an annual basis. DEQ has outlined two independent strategies to track whether or not these home sales include time of transfer OSDS

[1] Annual OSDS service and maintenance is required, pursuant to OAR 340.071.0130, for alternative treatment technologies (ATTs), sand filter and pressure distribution systems. Owners of these systems must submit an annual report to DEQ. Failure to submit an annual maintenance report results in an enforcement process which may include a civil penalty (OAR 340.012.0060). Owners of these systems must also submit a service maintenance contract with a certified maintenance provider prior to DEQ approval of permits for installation, repairs, or alterations.

inspections.

The first tracking mechanism for OSDS time of transfer inspections will be facilitated through approved inspectors that participate in the Oregon Septic Smart program. In order to maintain eligibility to participate with Oregon Septic Smart, inspectors must submit an annual inspection report. The report includes information on the number and outcomes of OSDS inspections. Annual submission of inspection reports through Oregon Septic Smart will help to guide outreach and enforcement efforts at the county level.

The second tracking mechanism enlists the use of a home buyer reporting process through Oregon Septic Smart. Home buyers are asked to fill out an on-line survey and answer questions about whether or not a septic system inspection was included as part of the home buying process. Potential survey participants will be identified using county assessors' records and contacted through USPS mail. Results from these two tracking mechanisms will be compared in order to identify any inconsistencies between data sets and to identify focus areas for outreach and evaluation.

The goal for 2014 is to achieve inspections for 60% of residential property transfers involving an OSDS in the coastal counties and 80% by 2020. However, because of the number of assumptions and uncertainties built into this estimate and the variability of conditions across the coastal zone area, DEQ will consider the overall weight of evidence – including inspectors' knowledge of local conditions and potential problem areas – to inform its decisions regarding additional outreach and evaluation efforts, as well as the need for a regulatory time of transfer inspection program.

To help prioritize DEQ's outreach and evaluation efforts, DEQ is developing a GIS tool that can be used to proactively identify coastal areas that have a high risk for OSDS repairs and failure. A similar approach has already successfully been used in one Oregon county to provide focused outreach and resources for OSDS repair and replacement. The target for the current project is to have a pilot area within a coastal county mapped and analyzed by September 2014. This model can then be used to identify high risk areas within all coastal counties. These data will also aid in the interpretation of inspection reports submitted through the Oregon Septic Smart program.

Preventive efforts to address OSDS repairs and replacements will be guided by identifying areas that meet two primary conditions: 1) a specific area classified as high risk for OSDS failure, using GIS modeling, and 2) tracking reports indicate that OSDS inspections are uncommon in said area. Areas that meet these conditions will be prioritized for targeted evaluation.

Oregon expects that the time of transfer program, in conjunction with other DEQ and county efforts aimed at proactively identifying and addressing OSDS contributing to nonpoint source pollution, will result in 95% of OSDSs in the coastal counties being inspected within 15 years.

<u>Back-up Enforcement Authority</u>

If the time of transfer program does not meet the objective of this measure DEQ will use its authority (ORS 454.635) to propose rules requiring time of transfer inspection for adoption by the Environmental Quality Commission.

Additional Management Measures - Forestry

EPA and NOAA issued a proposed determination in December, 2013, that the State of Oregon has failed to submit an approvable Coastal Nonpoint Pollution Control Program as required by Section 6217(a) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA). This determination was based in part on EPA AND NOAA's finding that Oregon had not satisfied the additional management measures for forestry.

EPA and NOAA previously determined that Oregon has the legal and programmatic tools to implement a forestry program that meet the requirements of Section 6217. Oregon contends that it also has the programs, policies and regulatory authorities in place to conform with EPA and NOAA's direction to adopt additional measures under Section 6217(b) (3).

This section includes an update on additional forestry measures Oregon has implemented since Oregon received interim approval in 1998 and a discussion of how these measures relate to the concerns raised by the federal agencies in the Federal Register Notice.

This section also provides a summary of key arguments from the July 1, 2013 submittal (see Appendix A for the full forestry CZARA submittal) to EPA/NOAA for the approval of Oregon's Coastal Nonpoint Program. The purpose is to re-iterate that Oregon's three tiered approach to maintaining and enhancing water quality and riparian habitat. This approach, coupled with adaptive management and regulatory authority of the Board of Forestry for evaluation of additional management measures, should be considered an approvable Coastal Nonpoint Pollution Control Program (CNPCP)

Legal/Policy Framework for Additional Measures under CZARA

EPA and NOAA's determination that Oregon is required to identify additional measures for forestry is based on the state's CWA Section 303(d) listing of a number of coastal streams for temperature impairment. It is important to note that additional measures in coastal nonpoint source plans under CZARA are not intended to implement the CWA, but they are intended to be operated in conjunction with the CWA. Accordingly, it is appropriate for Oregon to identify additional measures to operate in conjunction with DEQ's TMDL program and its existing Section 319 nonpoint source programs.

Moreover, the EPA and NOAA guidance specifies that states are to determine what additional measures are needed and states are to have significant latitude in making the determination of what additional measures are needed. While states may elect to adopt additional or more stringent measures the 6217(g) guidance, e.g., extended buffers, they cannot be required to adopt that approach.

When confronted with similar concerns over water quality listings and regulation of forestry, EPA and NOAA have in practice approved additional measures that were based on a state's commitment to strengthening of forest practice regulations as it determined necessary and to adopt and implement TMDLs for water quality limited streams (e.g., California Coastal Program

Approval, 2000). EPA and NOAA also have approved programs even when the additional management measures proposed to be implemented by the state fell well short of the BMPs that the federal agencies had recommended.

Oregon's Forest Management Program

The goals and vision of the Oregon Board of Forestry (Board) is to support a broad suite of Best Management Practices (BMPs) to insure that forest operations are conducted in a manner that meets state water quality standards. The Forest Practices Act (FPA) describes the relationship between the Board and the Environmental Quality Commission (EQC), giving oversight to the Department of Environmental Quality (DEQ) in carrying out the rules and statutes regarding implementation of the Clean Water Act. ORS 527.765 describes the relationship between the agencies. The statute requires the Board to establish BMPs that insure nonpoint source discharges of pollutants from forest operations do not impair the water quality standards established by the EQC. The statute also requires that the Board and EQC consult when reviewing and adopting BMPs to address nonpoint source discharges from forestland. The Board has also established an adaptive management loop that leads to an adaptive FPA and focuses monitoring and evaluation of the water protection rules to ensure that rules will maintain and improve the condition of waters of the state. See below for examples.

In 2003, the FPA was amended to adopt more stringent BMPs regarding road use during wet weather periods and adequate spacing of crossdrains. Use of forest roads during periods of wet weather or poor road drainage may lead to an increased risk of sediment delivery to waters of the state. In the case of wet-weather hauling, several forums (FPAC, IMST, and Sufficiency Analysis) identified the increased risk of sediment delivery when forest roads are heavily used during wet periods. ODF completed a 2 year monitoring study to evaluate the impacts of wet weather road use and determined, through monitoring data, that BMPs in place at that time were not effective at maintaining water quality. The Board then added BMPs (OAR 629-625-0700) to address wet weather road use by requiring operators to use durable road surfacing or other measures to prevent sediment delivery to waters of the state. Operators are also required to cease hauling when active use of the road is impairing water quality. These new BMPs are in addition to existing BMPs regarding road construction and road maintenance.

The 2002 Sufficiency Analysis, produced jointly by Oregon Department of Environmental Quality and Department of Forestry, found that for small and medium fish streams, current stream buffer prescriptions may result in short-term temperature increases on some Type F streams; however, the significance of the potential temperature increases at a watershed scale is uncertain. Follow-up monitoring (RipStream) showed that riparian protections on small and medium fish-bearing streams do not insure achievement of the protecting cold water criterion of the temperature standard. However, the biologically based numeric criteria of the temperature standard are being met by current riparian protections.

Currently, the Board is conducting rule analysis for small and medium fish bearing streams in response to ODF's RipStream monitoring results. Small and medium fish bearing stream

protection rule analysis and Board action taken to implement any resulting changes in BMPs, is planned for completion by the end of this year. Stream temperature and shade one to five years post-harvest; temperature effects downstream of harvest; large wood recruitment; and riparian stand characteristics and functions analyses are a priority and ODF will work with the Board and the DEQ to establish timelines for completion.

The Board completed implementation of the remaining sufficiency analysis recommendations as well as IMST and FPAC recommendations by adopting rules in 2007, that allowed the use of physical habitat criteria to classify streams as fish use or non-fish use (OAR 629-635-0200 (11) and reclassified streams with man-made barriers as fish-bearing upstream to the first natural barrier (OAR 629-635-0200 (11)), and with the inclusion of the remaining two rule concepts in and endorsement of the Oregon Plan for Salmon and Watersheds voluntary measures in 2009.

Oregon's Regulatory Authority

Under ORS 468B.110(2), ORS 527.765, and ORS 527.770, the Board of Forestry establishes best management practices or other control measures by rule that, to the maximum extent practicable, will ensure attainment and maintenance of water quality standards. If the Environmental Quality Commission does not believe that the FPA rules will accomplish this result, the EQC is authorized to petition the Board for more protective rules. If the EQC petitions the Board for review of BMPs, the Board has two options: terminate review with the EQC concurrence, or begin rulemaking. If the Board determines that BMPs should be reviewed, rules specifying the revised BMPs must be adopted not later than two years from the filing date of the petition for review, unless the Board, with concurrence of the EQC, finds that special circumstances require additional time.

Upon the EQC's request, the Board is required to take interim action "to prevent significant damage to beneficial uses" while the BMPs are being reviewed. The "BMP shield" under ORS 527.770 is lost if the Board fails to complete BMP revisions, or makes a finding that revisions are not required, within the statutory deadline. In addition, under 468B.110(2), the EQC cannot adopt rules regulating nonpoint source discharges from forest operations and the DEQ cannot issue TMDL implementation plans or similar orders governing forest operations unless "required to do so by the CWA." This authority would also be triggered by the failure of the Board to adopt adequate BMPs to implement TMDL allocations for forestry or to avoid impairment of water quality such that standards are not met.

As EPA and NOAA determined in 1998, Oregon's forestry program satisfies the CZARA forestry measures. The forestry program also includes provisions for revising or implementing additional forestry measures as needed to address water quality impairments. Oregon's forestry program, in concert with Oregon's policy and regulatory framework for protecting water quality relies on land use laws (Goal 4 – Forest Lands), an adaptive Forest Practices Act (FPA), and voluntary measures under the Oregon Plan for Salmon and Watersheds. **This three-tiered approach results in forestland having the highest water quality in Oregon, and avoids the impairment that would be caused by land use changes (ex-urban sprawl) seen in other states.**

- Strong land use provides resource and water quality protection by slowing the largest threat to sustainable forestry, the conversion and fragmentation of forestland.

- The Board requires effectiveness monitoring to ensure rules and best management practices are adequate to protect resources.

- Oregon has been more successful in retaining forestland relative to Washington; western Washington has lost 23% of family forestland, compared to 8 % loss in western Oregon.

- Washington's coastal zone has lost over 400,000 acres of forestland compared to 40,000 acres in Oregon.

- Additional regulations may be counterproductive, in terms of water quality, if they increase the rate of conversion.

- Voluntary measures (OPSW) result in additional protections. The Board of Forestry has committed to using voluntary measures where feasible and recognizes that a voluntary approach may have advantages over a traditional regulatory approach. Oregon would like to better capture and evaluate the implementation and effectiveness of voluntary measures to demonstrate their effectiveness for resource protection and restoration.

EPA's and NOAA's Concerns:

In 1998, EPA and NOAA granted "Conditional Approval" of the CNPCP. For full approval, NOAA and EPA stated that additional forestry measures were needed to:

- protect medium, small, and non-fish bearing streams

- protect high-risk landslide areas

- address the impacts of road operation and maintenance, particularly legacy roads

- ensure the adequacy of stream buffers for the application of certain chemicals.

ISSUE: Protect Medium, Small, and Non-Fish Bearing Streams

<u>EPA's and NOAA's Concerns:</u>

Under existing State forest practices, medium, small, and non-fish bearing streams may be subject to loss of sediment retention capacity, increases in delivery of fine sediments, and increases in temperature due to loss of riparian vegetation. Another concern is provision of adequate long-term supplies of large woody debris in medium, small, and non-fish bearing streams, a shortage of which can result in decreased sediment storage in upstream tributaries, increased transport and deposition downstream, and overall adverse impacts to beneficial uses.

Oregon's Response:

Oregon agrees that these are valid concerns, and the Board of Forestry is addressing them through the Forest Practices Act. The FPA requires the state to regulate forest practices to ensure water quality standards are achieved. (OAR 629-635-0100) This regulatory program includes provisions to identify inadequacies and revise regulations as needed to ensure water quality is protected. Oregon's efforts to address concerns on small and medium fish streams are described below.

Small and Medium Fish Streams: Changes to Protections since 1998

- Use of physical habitat criteria to determine if streams may support fish use. (OAR 629-635-0200)
- Reclassify streams with human-made barriers as fish-bearing upstream to the first natural barrier. (OAR 629-635-0200)
- Voluntary measures for high aquatic potential (HAP) streams, including large wood placement, additional basal area in stream buffers, large tree retention and treating Large and Medium sized non-fish streams the same as fish streams for stream buffer retentions. (Reported to Oregon Watershed Restoration Inventory).

The Board is conducting rule analysis for small and medium fish bearing streams in response to ODF's RipStream monitoring results. Small and medium fish bearing stream protection rule analysis and Board action taken to implement any resulting changes in BMPs, is planned for completion by the end of this year. Stream temperature and shade one to five years post-harvest; temperature effects downstream of harvest; large wood recruitment; and riparian stand characteristics and functions analyses are a priority and ODF will work with the Board and the DEQ to establish timelines for completion.

Small non- Fish Streams

Ecological system responses after harvest in small non-fish streams are highly variable in characteristics, functions, and relative influence on downstream reaches. Oregon has invested in three paired watershed studies that are testing hypotheses related to harvest effects at a watershed and reach scale as well as downstream. Results from the Hinkle Creek paired watershed study support the variable temperature response of non-fish bearing stream to harvests under forest practices standards. They also indicate that there was no measureable downstream effect on stream temperatures. The Trask paired watershed study received additional funding from the 2013 legislative session to continue vital research on small non-fish bearing streams. The results from these studies will complement other research on these highly variable headwater stream systems and allow Oregon to evaluate the current level of protection. Current protections include:

- Protection from potential impacts from harvest activities

- Prompt reforestation after harvest ensures rapid recovery of riparian protection, except when an approved land use change is filed, and a different set of land use laws apply.

The paired watershed studies and other monitoring programs demonstrate the State's commitment to a continuous learning and adaptive management approach to forestry best management practices. The state will use this important research and other information to ensure a science-based analysis of the effectiveness of current measures on non-fish bearing streams.

ISSUE: Protect High-Risk Landslide Areas

EPA's and NOAA's Concerns:

Regarding concerns with harvest activities in high risk landslide areas, evidence indicates that timber harvests on unstable, steep terrain can result in increases in landslide rates of approximately 200 to 400 percent. There are also indications that a relatively small proportion of potentially unstable ground in the Oregon Coast Range is responsible for the majority of landslides in Oregon.

Oregon's Response:

Based upon an evaluation of available information, Oregon does not agree that additional management measures for landslides are necessary to ensure water quality standards can be achieved. Scientific evidence and research show a significant dependence on geological setting, storm event size, and other non-human factors. Existing data on landslide rates also does not show how possible effects translate across space and time.

In 1999, Oregon completed a three year monitoring study which identified key points to help explain the relationship between storm intensity and landslide frequency. In three out of four study areas landslide density was greater in young stands, 0-10, compared to stands from 10 to 100 years. Landslide density in stands older than 100 years was greater than 10-100 year old stands but less than young stands. In 2003, revisions to the FPA regarding identification of landslide prone areas and harvesting on high landslide hazard locations were enacted.

Montgomery et al. (2000), examined landslide rates in some of the steepest and least stable terrain in the Oregon Coast Range. They found that:

- Landslide sensitivity was dependent on a combination of slope steepness and topography.

- Storms of less than a 4-year recurrence interval triggered landslides in the decades after timber harvest.

They also developed a model to estimate regional landslide rates based on mapped landslides from 14 industrial forest watersheds assessed under the Washington State watershed analysis methodology. The distribution of mapped landslides indicated that rates of shallow landslides varied dramatically between the watersheds. The model estimated that:

- Contemporary landslide rate was 3-9 times to the estimated background rate for the Oregon coast.

In 2007, record flooding and thousands of landslides occurred across southwest Washington and northwest Oregon. A study (Turner et al. 2010), examined associations between landslide density, precipitation, topography, and forest stand age. The study found:

- Very few landslides occurred with less than or equal to the 100-year rainfall category.
- At higher rainfall intensities, significantly higher landslide densities occurred on steep slopes (>70% gradient) compared to lower gradient slopes.
- Above 150% of 100-year rainfall, the density of landslides was 2–3 times larger in the 0–5 and 6–10 year stand age categories than in the 11–20, 21–30, 31–40, and 41+ categories. The effect of stand age was strongest at the highest rainfall intensities.
- Landslide density was similar to what was found in Oregon in 1999.

Oregon recognizes that landslides and debris flows are an important ecological disturbance agent and sediment transport process in coastal-zone forests. These processes deliver sediment and woody debris to downstream channels, often creating log jams where they deposit. While the effects of debris flows can adversely impact salmonids, debris-flow deposited log jams are also necessary habitat-forming agents for salmonids. The State will use existing and emerging research to further our understanding of the human-caused influence on the occurrence of landslides to inform further discussions.

<u>High Risk Landslide Areas: Changes to Protections since 1998</u>

- Identify debris torrent risk stream channels. (OAR 629-630-0500)
- FPA rule requiring leave trees along the channel of small non-fish bearing streams subject to rapidly moving landslides to slow debris torrent movement downstream and contribute large wood. (OAR 629-640-0210)
- Oregon Plan voluntary measure to leave trees on landslide prone slopes to contribute large wood.
- Reduce potential for sediment delivery to waters from ground-based harvesting on steep or erosion prone slopes. (OAR 629-630-0150)

- Developed Technical Note for placing roads outside of critical locations to ensure consistent resource protection. (ODF Technical Note #7, June 2003)

ISSUE: Address Impacts of Road Operation and Maintenance, Particularly Legacy Roads

EPA's and NOAA's Concerns:

The Federal government has indicated that they remain concerned about the adequacy of forest road measures to effectively address the impacts of road operation and maintenance, particularly legacy roads. EPA and NOAA (1998) define "Legacy forest roads" as, "roads constructed and used prior to adoption of the FPA (and not used and maintained since then) were not required to be treated and stabilized before closure." In more recent communication, the EPA extended the definition of legacy roads to include "forest roads that do not meet current State requirements with respect to siting, construction, maintenance, and road drainage."

Oregon's Response:

Oregon has made revisions to the FPA with regard to forest road measures since 1998 (see above) and contends that its forest practices regulations for forest roads are sufficient to ensure achievement of water quality standards, and that additional management measures for roads are not necessary at this time.

The FPA has definitions for three types of roads: Active, Inactive and Vacated. A road used for forest management access since the effective date of the FPA (1971) is either active or inactive and must be maintained to FPA standards, unless it is vacated (OAR 629-625-0600). Roads that are not maintained or pose a substantial risk of sediment delivery are addressed through enforcement authority. Landowners are also encouraged to implement voluntary measures to further reduce the risk of sediment delivery beyond the FPA. The 2002 ODF-DEQ Sufficiency Analysis concluded current road related best management practices (BMPs) are likely to maintain water quality if implemented in compliance with the FPA. Initial results from the Trask Watershed Study show little to no impact of road crossings on stream turbidity when roads are constructed and maintained according to FPA rules. Monitoring conducted in 2002 showed high levels of compliance with road rules. A compliance audit is also underway in 2013-2014 and ODF continues to implement road BMP training.

Road Operation and Maintenance: Changes to Protections since 1998

- Develop specific guidance for roads in critical locations. (ODF Technical Note #7 June, 2003)

- Require durable surfacing on roads used during wet season, cease hauling if sediment delivery exists. (OAR 629-625-0700)

- Reduce sediment delivery by installing cross drains. (OAR 629-625-0600 (9))
- Provide clarity on road drainage BMPs to reduce sediment delivery. (OAR 629-625-0330)

In addition:

- Under the Oregon Plan, forestland owners identified and prioritized roads for remediation.
- As of 2012, forestland owners have invested almost $100 million in voluntary measures.
- Redesign of ODF's notification and inspection process has increased FPA inspections
- Instituted an annual audit to measure compliance with the FPA.
- Entered into a cooperative agreement to update forest road data.
- ODF requires a management plan for family forestland owners to receive federal cost-share, including a description of roads based upon an onsite review.

ISSUE: Ensure the Adequacy of Stream Buffers for the Application of Certain Chemicals

<u>EPA's and NOAA's Concerns:</u>

Forest practice rules in effect at the time the Oregon 6217 program was submitted for approval *did not require buffers for aerial application of herbicides or fertilizers for type N (non-fishbearing) streams. Such streams comprise significant portions of total stream length in the coastal zone. In January 1997, the ODF revised its rules governing application of chemicals. […] The rules do not contain restrictions for aerial application of herbicides, which would appear to leave type N streams still at risk.*

<u>Oregon's Response:</u>

The Board designed the Chemical Rules to mesh with regulations administered by other agencies. All of the regulations apply to a given forest pesticide application, and where there is any difference, the more stringent requirement applies.

- Federal Pesticide Registration Requirements
- Oregon Pesticide Control Law
- Pesticide Spills and Hazardous Material Disposal.
- Worker Protection Standards

Forestry operators must not directly apply chemicals within specified distances of certain

waters. Except for additional protections for fungicides or nonbiological insecticides, Oregon relies on BMPs set by the ODA and EPA (under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)) for protection of small non-fish bearing streams during pesticide applications. *Note: this reliance on label applies to all land uses.*

The Board specifically required effectiveness monitoring and evaluation of the chemical rules to determine the effectiveness of the rules to meet the goals of the Forest Practices Act.

At the time of the 1998 EPA and NOAA decision, effectiveness monitoring results had not been published. However, recent studies indicate that current forestry measures are effective at ensuring injurious quantities of chemicals do not occur in waters.

- In 2000, ODF studied effectiveness of riparian buffers for protecting fish bearing streams (all detects < 1 ppb).
- Alsea Paired Watershed Study in central coastal Oregon (NCASI) addresses delayed impacts to water quality and impacts from streams that do not have an overstory riparian buffer (i.e., non-fish bearing streams) (only glyphosate detected; all detects < 1 ppb).
- United States Geological Service and Eugene Water and Electric Board completed a study of pesticides in the McKenzie River Basin (compounds associated with commercial forestry pesticide use were rarely detectable in the McKenzie River, always < 1 ppb).

Current studies indicate that concentrations from forestry applications occur at levels below 1 µg/L (1 ppb) which are much lower than currently available thresholds of concern for aquatic life (e.g., NMFS 2011 Biological Opinion set value of 100 µg/L for the maximum concentration limit on 2,4-D).

Update on Oregon's Programs and Policies

for Meeting the 6271(g) Agricultural Management Measures

The National Oceanic and Atmospheric Administration (NOAA) and the U.S. Environmental Protection Agency (EPA) (collectively, the federal agencies) issued a proposed determination in December 2013 that the State of Oregon has failed to submit an approvable Coastal Nonpoint Pollution Control Program (Coastal Nonpoint Program) as required by Section 6217(a) of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA). As part of the proposed determination, the federal agencies noted a concern that agricultural activities cause widespread pollution and that Oregon's efforts may not adequately protect water quality.

To investigate this concern, the federal agencies invited comment on the adequacy of Oregon's programs and policies for meeting the Section 6217(g) agriculture management measures and conditions placed on agricultural landowners under Oregon's Coastal Nonpoint Program. This document constitutes Oregon's comments relative to these concerns. It provides background on Oregon's agricultural water quality regulations and improvement efforts, an update on significant changes to the program since Oregon received interim approval in 2004, and information related to each concern raised by the federal agencies.

Background

The Oregon Legislature adopted the Agricultural Water Quality Management Act (ORS 568.900 – 568.933) in 1993 creating the Agricultural Water Quality Management (AWQM) Program. The AWQM Program implements the State Board of Agriculture's resolution that sets forth the State's philosophy [OAR 603.090] of an outcome based program that includes a combination of education, outreach, and technical assistance is the most effective way to maximize returns on State, Federal, and local efforts to improve and maintain water quality as well as address water impairment from agricultural activities and lands. Oregon accomplishes this through an active partnership that starts with the Oregon Department of Agriculture (ODA) and the farmers and ranchers who grow food and fiber, and includes other vital partners such as: 45 Soil and Water Conservation Districts (SWCDs), Oregon Watershed Enhancement Board (OWEB) and associated Watershed Councils (WSCs), Oregon Department of Environmental Quality (DEQ), Oregon Department of Fish and Wildlife, Oregon State University Extension Service, Meyer Memorial Trust, Bonneville Environmental Foundation, The Freshwater Trust, USDA Natural Resources Conservation Service (NRCS), USDA Farm Services Agency (FSA), and other stakeholders.

ODA is authorized in Oregon law to enforce Agricultural Water Quality Management Area

(AWQMA) Rules under ORS 568.912. ODA pursues enforcement through investigations of citizen complaints, notifications from public agencies, and ODA-initiated actions.

In 2004, EPA AND NOAA provided Oregon with interim approval for meeting the 6217(g) agriculture management measures and conditions. Since that time, Oregon has continued to expand the agricultural program to improve its effectiveness at maintaining and improving water quality. Significant actions associated with agricultural programs and policies that have happened since the state was granted interim approval on this measure include the following. These actions are further described later in this document.

- Agricultural Water Quality Management Area (AWQMA) plans and rules have been in effect in all 6217(g) management areas (MAs) in Oregon since 2004. The AWQMA rules include 6217(g) management measures (MMs) as well as additional measures as options available to landowners to meet requirements to protect and maintain water quality standards.
- ODA developed a legally sound regulatory program for violations associated with the AWQM Program and has been conducting compliance actions as a regulatory tool to address rule violations.
- The Oregon Legislature has continued to authorize and provide significant funding to ODA, OWEB and local SWCDs to implement the AWQM Program goals through outreach, technical and financial assistance, project development, and compliance action where needed.
- Oregon's Confined Animal Feeding Operation Program issues NPDES permits jointly with DEQ to all Grade A dairies addressing all 6217(g) agricultural management measures and alternative grazing measures. Oregon is on schedule to update the 2009 CAFO NPDES permit when it expires in May 2014. Oregon's Confined Animal Feeding Operation program covers more animal feeding operations than would be covered by a concentrated animal feeding operation program administered by EPA. Specifically, more operations are covered under the state's NPDES CAFO program and additional operations are subject to state-only water pollution control facilities permits. Further, all animal feeding operations are subject to statutory prohibitions on discharges of animal wastes that pollute waters of the state.
- In 2012, ODA and DEQ updated the Memorandum of Agreement describing how the agencies will work together to succeed in improving and protecting water quality in the state.
- The Board of Agriculture adopted action items supporting the development of alternatives to a complaint-based program and the expansion of the AWQM Program that further builds cooperative relationships with agricultural partners, strategically focuses plan implementation, and improves compliance.
- The AWQM Program has developed and initiated a pilot program to assess water quality conditions associated with agricultural lands and strategically focus resources and compliance actions to improve conditions where needed.

Agriculture and Water Quality Protection in Oregon's 6217 management area

Agricultural lands represent approximately 5% of the 5.8 million acres in Oregon's 6217 management area – primarily in pasture/hay production. The pasture/hay category is not all actively used for production and does include natural meadows and grasslands. Most of the water quality protection and improvement accomplished on agricultural lands have been achieved through cooperatively working with landowners without the need for enforcement action. Technical assistance is offered through Oregon's SWCDs, primarily for project planning and design elements. Financial assistance is available in federal programs (Conservation Reserve Program (CRP), Conservation Reserve Enhancement Program (CREP), and Environmental Quality Incentives Program (EQIP)) to fund on-the-ground projects. Cumulative federal investments in CRP and EQUIP from 1995 – 2012 in Oregon's coastal counties totaled $20,758,226 (source http://farm.ewg.org). In 2013 alone, federal CREP investments in Oregon's 6217 management area totaled $4.2 million with 3,009 acres enrolled to convert highly erodible cropland or environmentally sensitive acreage to long-term vegetative cover.

Oregon's commitment to water quality in the 6217 management area is further demonstrated by substantial State investments in programs and on-the-ground projects. Over the last 15 years, the Oregon Legislature, OWEB, and agricultural landowners have reported nearly $30 million contributed for technical assistance, education and outreach, and project implementation. This does not include projects done by landowners on their own without government assistance. The SWCDs that contributed outreach, education and technical assistance to landowners in support of Oregon's CNPCP include Columbia SWCD, Clatsop SWCD, Tillamook SWCD, Lincoln SWCD, Siuslaw SWCD, Umpqua SWCD, Douglas SWCD, Coos SWCD, Curry SWCD, Josephine SWCD, Illinois Valley SWCD, and Jackson SWCD.

The following tables summarize OWEB grant funded projects completed in the North Coast, South Coast, Umpqua and Rogue Basins between 1998 and 2012, and SWCD activities in the 6217 management area between 2003 and 2012.

OWEB Project Summary on Agricultural Lands in the 6217 Management Area (1998-2012)

Year	*Total Cash*	*Total In-kind*	*Count of Projects*
1998	$815,974	$214,528	49
1999	$787,903	$296,009	123
2000	$1,052,799	$490,524	77
2001	$1,050,381	$308,113	74
2002	$1,055,844	$310,982	57
2003	$1,466,920	$235,090	53
2004	$1,251,117	$593,867	181
2005	$280,416	$102,056	28

2006	$605,513	$161,774	47
2007	$1,142,538	$172,222	55
2008	$1,714,020	$331,239	63
2009	$1,215,665	$349,852	50
2010	$640,368	$251,075	49
2011	$1,634,059	$404,017	41
2012	$3,104,113	$1,149,079	46
TOTALS	$17,817,630	$5,370,427	993

OWEB Project Type on Agricultural Lands in the 6217 Management Area (1998-2012)

Riparian activities	***Miles***	***Acres***	***Livestock Crossings***
Livestock stream access/crossing created or improved			66
Nurse log placement		45	
Other riparian activity	5.4	14.02	
Riparian fencing	306.84	2180.94	
Riparian invasive plant control	112.96	677.66	
Riparian tree planting	683.93	3387.77	
Riparian vegetation management	77.25	352.43	
Riparian vegetation planting	55.55	288.59	
Upland activities	***Miles***	***Acres***	***Watering Developments***
Off-channel livestock or wildlife watering			383
Conservation buffers	4.1	47.5	
Grazing management		838	
Irrigation system improvement		1236.24	
Nutrient/manure management		43.7	
Other upland activity		20	
Upland erosion control		131	
Upland fencing		646.5	
Upland invasive plant control		276.55	
Upland tree planting		63.28	
Upland vegetation management		261.6	
Upland vegetation planting		160.9	

These State investments through OWEB-funded projects resulted in riparian restoration activities, listed in the table above, on 956 linear stream miles and treatment of 2759 upland acres in the 6217 management area.

Oregon's substantial investments have combined with technical assistance and capital funds from local, state, federal, and nonprofit partners, thus making substantial resources available to protect and improve water quality in the 6217 management area and throughout Oregon.

SWCD Activities in the 6217 management area (2003 – 2012)												
SWCD	Landowner contacts	Workshops & Presentations	Workshop & Presentation Attendees	Tours	Tour Participants	Displays	Display visitors	Demon-strations	Demonstration Participants	Site Visits	Funding Applications	WQ Projects
Clatsop	1,106	42	3,987	3	183	24	3,740	-	-	323	64	35
Columbia	7,856	56	1,289	26	168	34	3,616	136	3,200	422	70	78
Coos	3,540	32	909	6	60	47	3,100	2	55	296	75	54
Curry Co.	3,307	20	386	14	105	5	622	4	115	289	35	107
Douglas	3,611	30	1,287	13	236	38	14,445	4	390	794	186	309
Illinois Valley	765	11	324	40	255	22	11,989	-	-	48	33	21
Jackson	22,388	115	3,107	46	565	21	4,815	9	509	658	65	29
Josephine	769	33	842	4	63	22	60,038	-	-	170	49	36
Lincoln	2,275	39	894	11	218	18	3,280	23	21,970	572	88	129
Siuslaw	931	10	157	16	208	8	1,247	12	162	377	83	53
Tillamook Co.	1,012	31	746	14	153	12	7,608	7	3,340	373	38	137
Umpqua	1,727	26	683	6	82	22	85,782	5	660	223	38	42
TOTAL	49,287	445	14,611	199	2,296	273	200,282	202	30,401	4,545	824	1,030
Total # of contacts with landowners: 102,170												
Total # of activities: 1,670												

Response to Agricultural Concerns Identified in Federal Notice

Concern #1: Enforcement is limited and largely complaint-driven; it is unclear what enforcement actions have been taken in the coastal nonpoint management area and what improvements resulted from those actions.

ODA has the authority to enforce AWQMA Rules under ORS 568.912. Oregon Law states that "… the department may require any landowner…to perform those actions…necessary to prevent and control water pollution from agricultural activities and soil erosion" (ORS 568.912(2)). Apart from these provisions, DEQ retains full enforcement authority of its regulations. ORS 568.930(1) requires landowners "to conduct all agricultural activities on agricultural lands within the boundaries of an area subject to a water quality management plan in full compliance with the rules implementing the plan and with all the rules and standards of the Environmental Quality Commission relating to water pollution control. In addition, to any other remedy provided by law, any violation of those rules or standards shall be subject to all remedies and sanctions available to the Department of Environmental Quality or the Environmental Quality Commission."

The state has provided a legal opinion from its Attorney General pursuant to NOAA and EPA's 1998 *Final Administrative Changes to the Coastal Nonpoint Pollution Control Program Guidance*, demonstrating that Oregon has adequate regulatory authority to ensure implementation of the AWQMA rules. The legal opinion asserts that DEQ and the Environmental Quality Commission (EQC), in conjunction with ODA, has statutory authority to prevent nonpoint source pollution and require implementation of the 6217(g) management measures for agriculture as necessary under ORS 468B and ORS 568.900 to ORS 568.933. ODA must consult with DEQ and the EQC in the adoption and review of AWQMA Plans and the adoption of rules to implement the plans, providing a clear link between implementing and enforcing agencies (ORS 568.930). In addition, ODA's regulatory authority for nonpoint source water pollution from agricultural activities mirrors DEQs by including ORS 468B.025 by reference in the rules for each of the AWQM areas.

ODA and Local Advisory Committees (LACs) completed AWQM Plans and associated enforceable AWQMA Rules along the Oregon coast from the Columbia River to the California border in 2004. Since that time, ODA's compliance program has expanded from a complaint-based program to include actions initiated from observations by ODA staff. Further, Oregon initiated Strategic Implementation Areas in 2013 that assess streamside vegetation and address all observed agricultural conditions. ODA will begin to add new areas after learning from pilot areas. ODA has completed 55 compliance cases within the 6217 management area since the AWQMP rules were adopted. Compliance actions have resulted in improved streamside vegetation that provides shade, stabilizes banks, reduces soil erosion, and enhances filtration of

runoff.

For example, in one compliance case in the 6217 management area involving a livestock operation not required to register to the CAFO NPDES permit, ODA investigators documented that a significant volume of manure had been placed where it had the potential to cause pollution to surface and ground water, a violation of OAR 603-095-2240(3)(4) for application of nutrients and waste that cause water pollution. In response to ODA's warning of a AWQMA rule violation, the landowner constructed a 24' x 96' covered manure storage facility. This allows the landowner to safely store and compost manure until environmental conditions are appropriate to apply the compost to the pastures. This solution will prevent significant amounts of manure from contact with surface and ground water and improve the landowner's management options to better utilize his nutrient resource and prevent pollution.

In another compliance example in the 6217 management area, ODA investigators documented a streamside area degraded by livestock access. The banks along the stream were degraded and sloughing, resulting in erosion into the stream. Livestock use and grazing prevented site capable vegetation (vegetation that the site is capable of growing) from establishing and maturing. These conditions were in violation of OAR 603-095-2240(2). In response to ODA's warning of a violation of water quality regulations, the landowner constructed a livestock exclusion fence and planted riparian vegetation between the stream and the fence. This solution resulted in the protection and restoration of approximately 7,000 feet of stream.

As part of ODA's on-going review of program effectiveness and associated discussions with the State Board of Agriculture, in May 2012, the Board adopted an action item recommending that ODA develop additional alternatives to a complaint-based compliance program. The Board further recommended that the AWQM Program devote more resources to further building cooperative relationships with agricultural partners, expanding plan implementation, and improving compliance.

In response, ODA designed and began implementation of Strategic Implementation Areas (SIAs). SIAs are small geographic areas, represented by 6th Field Hydrologic Unit Codes (HUCs), selected by ODA for additional compliance attention. ODA conducts a pre-assessment to evaluate compliance with agricultural water quality regulations in the watershed, performs outreach to affected landowners, makes contacts and visits locations that still may violate regulations, and then performs a post-assessment compliance evaluation. ODA is currently testing the SIA process in two 6th Field watersheds in Oregon. After these test SIAs are completed in approximately two years, ODA will adjust the program based on what it learns, and then expand the effort throughout the state including into the 6217 management area.

In March 2013, the Board of Agriculture passed a resolution supporting the implementation of SIAs. The resolution states, in part:

> Be it further resolved: The Board of Agriculture supports the Agricultural Water Quality Management Program establishing and piloting a strategic program implementation process that prioritizes and targets resources to achieve compliance with the local area rules. The effort should be founded on the basic conservation principles of erosion control, nutrient management, stream bank stabilization, and moderation of solar heating of streams, promoted by aligning resources with local, state and federal natural resource partners.
>
> Be it further resolved: The Board of Agriculture supports identifying key geographic areas to focus the department's resources on accelerating landscape assessments, accounting for conservation efforts, and measuring results and outcomes.

This resolution along with ODA's strategic implementation actions demonstrates Oregon's commitment to create a more active AWQM Program compliance effort.

The State through ODA's Confined Animal Feeding Operations (CAFO) program has specific program responsibilities for nutrient management on CAFOs that provide additional support for meeting 6217(g) guidance. Nutrient management plans, consistent with the 6217(g) guidance, are required under all new or expanded CAFO permits in compliance with ORS 468B, OAR 603-74, and the Federal Water Pollution Control Act (33 U.S.C., Section 1251 et seq.). All CAFOs registered to the Oregon 2009 CAFO NPDES General Permit have developed and are implementing Waste Management Plans to insure that nutrients and animal nutrient waste are applied at agronomic rates for the crop being produced and so runoff doesn't occur. Applications inconsistent with the Animal Waste Management Plans are violations of the permit, subject to enforcement action and have resulted in the issuance of civil penalties to the operators. Requirements of the Animal Waste Management Plans can be found at http://www.oregon.gov/ODA/NRD/docs/pdf/awmp_minreq.pdf

Concern #2: The Agricultural Water Quality Management Area (AWQMA) plan rules are general and do not include specific requirements for implementing the plan recommendations, such as specific buffer requirements to adequately protect water quality and fish habitat.

As acknowledged by the federal agencies, all AWQMA Plans within the 6217 management area include the 6217(g) management measures as well as emerging technologies and alternative measures to allow landowners flexibility in meeting the required agricultural conditions and functions to protect water quality. Specific required conditions and functions include a healthy

riparian area that provides stream shade, bank stability, and filtration of contaminated runoff. Local SWCDs and watershed councils utilize all available tools to fulfill the goal of Oregon's AWQMA Plans and objectives of the federal agencies, that is, to prevent and control water pollution and soil erosion. Oregon's AWQM Program protects water quality through dedicated State funding, ongoing outreach to landowners and a robust monitoring strategy. Supporting this foundation of Oregon's program is State authority to enforce legally required functions and conditions under area rules (ORS 568.900 – 568.933). If an inspector finds that agricultural activities prevent the required functions, ODA will issue a violation and require the landowner to change or remove the applicable activities.

ODA follows a strategy of adaptive management when evaluating whether additional measures are necessary to achieve the objectives of 6217(g) measures. This is accomplished by determining whether agricultural activities are minimizing erosion, preventing the movement of nutrients, bacteria and pesticides into water bodies, and assessing whether riparian areas are established and growing in order to provide stream shade, runoff filtration and stream bank stabilization. The AWQM Program approach is supported by the 125 studies referenced in ODA's white paper "*Scientific Basis for an Outcome-based Water Quality Management Program*" and "*Agricultural Conservation and Environmental Programs: the Challenge of Measuring Performance*", Sarah Bates and Lynn Scarlett, University of Montana, April 2013.

<u>Concern #3:</u> AWQMA planning has focused primarily on impaired areas when the focus should be on both protection and restoration.

AWQMA plans and associated regulations define conditions and functions that agricultural activities must provide or avoid. These conditions apply equally to impaired areas as well as to healthy areas. This is especially true for requirements to provide shade and to prevent pollution; administrative rule language protects areas currently in compliance.

> OAR 603-090-0000(3) Agricultural water quality management area plans are plans that comprehensively outline measures that will be taken to prevent and control water pollution from agricultural activities and soil erosion on agricultural and rural lands located in a management area which requires such a plan and for which boundaries have been established by the department.

In addition to the ODA initiation of priority Strategic Implementation Areas (SIAs), ODA has partnered with the State's 45 SWCDs to implement 45 Focus Areas (FAs) around the state. FAs concentrate limited resources and measure effectiveness in smaller geographic areas where change may be measured faster. While these efforts are focused on impaired areas since they are seen as the best, most effective way to prioritize staff and funding to improve water quality,

AWQMA Plans and rules require all agricultural landowners to take the steps necessary to both protect landscape conditions and water bodies currently meeting water quality standards as well as to improve land conditions that result in improving water quality where standards are not being achieved.

Concern #4: The State does not administer a formalized process to track implementation and effectiveness of AWQMA Plans.

A formalized process to track implementation and effectiveness of AWQMA Plans is set in Oregon Administrative Rule (OAR). OAR 603-090-0020(4)(c) requires the biennial review of each AWQMA Plan in the state by ODA and a Local Advisory Committee (LAC). These reviews must include progress made as well as impediments, and recommendations for any changes that ODA should make to prevent and control water pollution. ODA and LACs conduct approximately 18 biennial reviews every year as part of Oregon's efforts to continually improve our planning and regulatory efforts.

As part of ODA's on-going review of program effectiveness, the program has sought input from the State Board of Agriculture, interested parties in the state, and DEQ. Input from these activities resulted in an update to the ODA-DEQ MOA in 2012. One of the updates involved specifying that AWQMA Plans should include measurable objectives, timelines, and milestones. ODA is working with LACs and each AWQMA Plan's Local Management Agency (LMA) to insert specific and measurable objectives, timelines, and milestones in each Plan to better gauge and communicate numeric progress and effectiveness rather than anecdotal improvements.

Following is an example of measurable objectives, timelines, and milestones from the Mid Coast AWQMA Plan, located at the center of the 6217 management area. Progress is moving according to scheduled timelines with the first three action steps completed to date.

Identify, and focus outreach and technical assistance work in, a small geographic area to implement the Area Plan in a more measurable way:

- By January 2014, an assessment of streamside vegetation conditions along agricultural lands in the entire Management Area will be complete. This assessment will be used to track and report progress in streamside vegetation improvements over time and to identify areas to focus work.
- By July 2013, small geographic areas will be identified within the Management Area for the Lincoln and Siuslaw SWCDs, where outreach and technical assistance work will be focused over a two-year period, starting in July 2013.
- By July 2013, ODA and/or the SWCD will complete an assessment in the area that identifies:
    - the amount of streamside areas meeting water quality goals,

- streamside areas that are improving,
- and streamside areas that need work.

Objectives and timelines will be established for the areas needing work. ODA and the SWCD will report back to the LAC on the status of land conditions, and outreach and technical assistance efforts in the area, at the 2015 biennial review.

- By the 2015 biennial review, an increase of 10 percent of streamside areas along agricultural lands where the assessment identifies agricultural activities as likely preventing riparian vegetation establishment will be in a condition where agricultural activities no longer prevent streamside vegetation from establishing.
- By 2020, an increase 25 percent of streamside areas along agricultural lands where the assessment identifies agricultural areas as likely preventing riparian vegetation establishment will be in a condition where agricultural activities no longer prevent streamside vegetation from establishing.
- By the 2015 biennial review, the SWCD will have offered technical assistance to all landowners in the area with lands where agricultural activities appear to prevent streamside vegetation from establishing. By the 2015 biennial review, the SWCD will report back to the LAC and ODA on the amount of lands where landowners accept voluntary assistance to allow streamside vegetation to establish and develop.
- By the 2015 biennial review, ODA and/or the SWCD will complete a follow-up assessment in the area and evaluate land condition changes over the two-year period.
- By the 2015 biennial review, areas where visible pasture and cropland erosion is occurring will be identified. Goals and timelines will be established to eliminate erosion or have structures in place to capture sediment, and ODA and the SWCD will report back to the LAC on the status and conditions in the area at the 2015 biennial review.

Since 2012, ODA has worked with the Oregon Association of Conservation Districts (OACD) and the state's 45 SWCDs to implement Focus Areas (FAs), including eight in the 6217 management area. Each AWQMA has at least one FA. In each FA the local SWCD works with partners to prioritize a watershed (normally a 6th Field HUC, but could be smaller or larger) in the AWQMA to focus education, outreach, technical assistance, assessment, monitoring, tracking, and reporting. The SWCD, serving as the AWQMA Local Management Agency, will report FA progress and accomplishments to ODA and the plan's LAC at each biennial review. In this way Oregon will see improved tracking of the progress of each FA and the changes made on agricultural lands. ODA will work with each SWCD so that as significant change is made in a FA, the SWCD will move on to another watershed in the AWQMA until, over time, the entire AWQMA where agriculture is prevalent has received prioritized attention, assessment, and tracking.

<u>Concern #5</u>: AWQMA planning and enforcement does not address "legacy" issues created by agriculture activities that are no longer occurring.

Local, state, and federal government entities have worked with landowners since European settlement of Oregon to make the coastal area more amenable to human living and production. Human settlement resulted in the construction of significant infrastructure along our streams, including roads, bridges, and dams. In the process of construction and alteration, we straightened and channelized streams, often with state and federal funding. Together, these activities resulted in altered water flows, degraded streambeds, loss of fish habitat, and other legacies.

Oregon's agricultural producers are unable to remedy these natural resource and infrastructure issues on their own—it will take a coordinated and prioritized effort utilizing private, local, state, and federal resources.

Oregon actively funds and coordinates with multiple partners to address legacy issues that agricultural activities can improve. Oregon strategically prioritizes technical assistance and funding through the ODA-SWCD partnership to improve agricultural activities and water quality functions over-time. Since 1998, multiple local, state, federal, and other partners have invested over $50 million dollars to address legacy issues such as lack of woody vegetation and shade along streams, degraded banks, and streamside dominance of invasive species such as reed canary grass and Himalayan blackberry.

Further, the OWEB has partnered with multiple watershed councils and the Bonneville Environmental Foundation to create the Model Watershed Program that invests funds and resources in priority watersheds. The Coos Watershed Association is a coastal partner, based in Coos Bay, Oregon.

Today multiple entities and programs are better coordinated through improved communication and cooperation at the state level to bring together program goals and resources to help address legacy and other water quality issues. Some of these entities include OWEB, NRCS, FSA, DEQ and its 319 Program, Meyer Memorial Trust, SWCDs and Water Conservation Districts, watershed councils, and others.

Agricultural Questions

Question #1: Has the State satisfied the <u>agriculture conditions</u> placed on its coastal nonpoint program?

Oregon has met all conditions placed on agricultural measures that led to EPA and NOAA approval of Oregon's Coastal Nonpoint Pollution Control Program as follows.

Measure: Confined Animal Facilities

Condition 1: Oregon will include management measures for facilities where animals are confined for less than four months and that do not have prepared surfaces or waste water control facilities. Condition met through the adoption of AWQMA plans and rules for the 6217 management area.

Condition 2: Oregon will provide a strategy for use of the State's water quality law as a backup enforceable mechanism. Condition met through the adoption of AWQMA plans and rules for the 6217 management area.

Measure: Erosion and Sediment Control, Nutrient, Pesticide, Grazing and Irrigation Water Management

Condition 1: Oregon will designate agricultural water quality management areas that encompass agricultural lands. Condition met in 2004 when all AWQMA plans were complete.

Condition 2: Oregon will complete the wording of the alternative management measure for grazing. Condition met with Oregon adopting alternative management measure language approved by EPA and NOAA.

Condition 3: AWQMA Plans will include management measures. Condition met with all management measures incorporated into AWQMA plans as options to meet requirements to protect and maintain water quality.

Condition 4: AWQMA Plans will include a process for identifying practices that will be used to achieve the pesticide management measure. Condition met with development of the State Pesticide Management Plan that has been incorporated as guidance into AWQMA Plans as well as through the Pesticide Stewardship Partnership, a multi-agency effort working cooperatively with landowners applying pesticides in priority areas where pesticides have been detected in surface water and/or groundwater.

Condition 5: Oregon will develop a process to incorporate the irrigation water management measure into the overall AWQMA Plans. Condition met with all AWQMA Plans containing guidance irrigation water measures.

Condition 6: Establish AWQMA Plans for all coastal watersheds. Condition met with completion of all AWQMA Plans statewide in 2004.

Question #2: Does the State have programs and policies in place that provide for the implementation of the 6217(g) agriculture management measures to achieve

and maintain water quality standards and protect designated uses?

The AWQM Program, in conjunction with the various statewide coordination efforts described below, provide an effective framework to satisfy federal Coastal Nonpoint Pollution Control Program goals for 6217(g) management measures. All AWQMA Plans include the 6217(g) management measures as well as emerging technologies and alternative measures as tools for achieving the required agricultural conditions to protect water quality. Oregon's framework includes dedicated State funding, ongoing outreach to landowners, and a robust monitoring strategy. Supporting this foundation of Oregon's program is State authority to enforce legally required functions and conditions under area rules (ORS 568.900 – 568.933). ODA compliance investigators do not determine if a *practice* has been implemented – the output – but considers whether the producer has achieved the required *function* – the outcome. The AWQM Program approach is supported by the 125 studies referenced in ODA's white paper "*Scientific Basis for an Outcome-based Water Quality Management Program*" and "*Agricultural Conservation and Environmental Programs: the Challenge of Measuring Performance*", Sarah Bates and Lynn Scarlett, University of Montana, April 2013.

ODA follows a strategy of adaptive management when determining whether additional management measures are necessary to achieve the objectives of 6217(g) guidance measures. This is accomplished by determining whether agricultural activities are minimizing erosion; preventing the movement of nutrients, bacteria and pesticides into water bodies; and assessing whether riparian areas are established and growing in order to provide stream shade, runoff filtration and stream bank stabilization. If an inspector finds that agricultural activities prevent the required functions, ODA will issue a violation and require the landowner to change or remove the applicable activities. ODA promotes the use of 6217(g) management measures, as well as other equally or more effective options, to achieve compliance and protect water quality.

ODA has MOAs with several partner agencies for statewide coordination of efforts to improve water quality, including:

<u>The ODA-DEQ MOA</u> is an MOA first signed by ODA and the DEQ in 1998, describing how the agencies work together during the development of Total Maximum Daily Loads (TMDLs) and AWQMA Plans and Rules. In 2012, the agencies updated the MOA after soliciting feedback from stakeholders. The updates define how the agencies work together to implement TMDLs, review water quality standards, and implement and review Area Plans and Area Rules.

<u>The CAFO Agreement</u> is an MOA between ODA and DEQ authorizing ODA to perform any function of the EQC or DEQ related to the control and prevention of water pollution from a

confined animal feeding operation ORS 468B.217(a). The MOA further authorizes ODA CAFO staff to "enter onto and inspect, at any reasonable time, a confined animal feeding operation or appurtenant land for the purpose of investigating a source of water pollution or to ascertain compliance with a statute, rule, standard or permit condition relating to the control or prevention of water pollution from the operation" (ORS 468B.217(b).

Conservation Effectiveness Partnership (CEP) is an agreement in place since 2010 between ODA, DEQ, OWEB and NRCS, to share information with the purpose of fulfilling mutual agency needs for monitoring and evaluating the effectiveness of conservation and restoration activities from their collective technical and financial assistance programs. The resulting cumulative effectiveness monitoring plays a key role in demonstrating the accountability, success and value of restoration investments both to advance state and federal missions of protecting water quality and to be more strategic with implementation of programs and resources.

Pesticide Stewardship Partnership (PSP) includes an agreement between ODA, DEQ, ODF, and DHS initiated in 2009. Participating agencies serve on the Water Quality Pesticide Management Team formed to coordinate, communicate, support and facilitate cooperative water quality protection programs related to pesticides. The purpose of ODA's statutory authority (ORS 634) as well as delegated federal authority by EPA under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), is the enforcement of pesticide regulations as well as to protect people and the environment from possible adverse effects of pesticide use. Oregon's PSP program is now a model nationwide.

Enterprise Monitoring is part of a commitment in Governor Kitzhaber's 10-Year Plan for Oregon to continue to reduce the percentage of streams with declining water quality and to assure that water quality is improving throughout the state by 2022. Oregon's 2013-15 biennial budget appropriates nearly $5 million to build upon a cross-agency enterprise approach to monitoring water quality and watershed health. Under this enterprise approach, state agencies have invested in a number of cooperative monitoring efforts that inform investment decisions including: tracking changes in riparian conditions, providing pesticide outreach and compliance monitoring, and funding additional ambient water quality monitoring. Based on enterprise monitoring data, the first project prioritized by the CEP was the Wilson River basin restoration project located within the 6217 management area. The Wilson River project (combination of many basin projects) led to dramatic improvements in water quality over the past ten years. Local citizens, dairy farmers, Tillamook Estuary Partnership, OWEB, Oregon State University, NRCS, FSA, DEQ, ODA and the Tillamook SWCD spent millions of dollars on projects that included riparian plantings, fencing, covering manure-storage areas, improving irrigation systems and fertilization rates to prevent runoff, invasive species removal, purchase of three wetland parcels and improvements to the Tillamook County Creamery Association wastewater

treatment system. The Governor's budget commitments are scaling up this enterprise approach to other basins in the state.

Conclusion

Oregon ensures agricultural implementation of nonpoint source pollution controls in the 6217 management area through the ODA AWQM Program and CAFO Program. ODA has authority to enforce AWQMA regulations under ORS 568.912(2). Under ORS 568.930(1), DEQ retains full enforcement authority of its regulations. An MOA between ODA and DEQ, updated in 2012, defines how the agencies work together to implement TMDLs, review water quality standards, and implement and review AWQMA Plans and Rules.

The state has provided a legal opinion from its Attorney General demonstrating the state has adequate back-up authority to ensure implementation of the AWQMA rules. The legal opinion asserts that DEQ and the EQC, in conjunction with ODA, has statutory authority to prevent nonpoint source pollution and require implementation of the 6217(g) management measures for agriculture as necessary under ORS 468B and ORS 568.900 to ORS 568.933.

Initially, enforcement activities for the AWQM Program were solely in response to complaints received by the department. Beginning in 2009 ODA expanded its enforcement activity to include compliance issues observed by ODA staff. In 2012 the department initiated development of its strategic implementation initiative – a systematic approach to assess water quality conditions associated with agricultural lands and strategically focus resources and compliance actions to improve conditions where needed. The strategic implementation effort was initiated in two pilot areas and entails pre-assessments (of riparian area conditions and other potential pollution sources), landowner outreach, site visits and post-assessments. ODA works with landowners and coordinates financial and technical assistance to achieve compliance with AWQMA regulations with enforcement action pursued when identified corrective action is not forthcoming. If an inspector finds that agricultural activities prevent the required functions, ODA will issue a violation and require the landowner to change or remove the applicable activities.

In addition to the ODA initiation of priority Strategic Implementation Areas (SIAs), CAFOs are regulated separately (ORS 468B.025, 468B.050, 468B.200-.217) and require NPDES permits. Oregon CAFO NPDES permits include careful tracking of nutrients entering onto and leaving the operation, resulting in careful nutrient management in the 6217 management area. CAFOs must also comply with riparian function regulations.

Further, the Conservation Effectiveness Partnership tracks water quality monitoring results which helps to prioritize projects. This effort began in 2010 and is supported by substantial

legislative financial commitments authorized in response to the Governor's Enterprise Monitoring initiative. The monitoring results are used to prioritize projects to focus investments and staff resources in the 6217 management area aimed at gaining the most water quality improvement through investments from all sources.

ODA has partnered with the State's 45 SWCDs to implement 45 Focus Areas (FAs) around the state. Focus Areas concentrate limited resources and measure effectiveness in smaller geographic areas where change may be measured faster. Focus Areas are considered an effective way to prioritize staff and funding to improve water quality.

Oregon's commitment to water quality in the 6217 management area is further demonstrated by substantial State investments in programs and on-the-ground projects. Over the last 15 years, the Oregon Legislature, OWEB, and agricultural landowners have contributed nearly $30 million for technical assistance, education and outreach, and project implementation in the 6217 management area. These State investments funded projects that resulted in restoration of a total of nearly 1,000 linear stream miles, and investments in the multiple upland activities treated over 2,700 upland acres.

Additionally, ODA has worked with the NRCS and FSA to fund water quality improvement projects within the 6217 management area. Federal investments in the coastal zone counties from 1995-2012 topped $20 million under the CRP and EQUIP programs. In 2011, the CRP had 6,572 acres enrolled in coastal counties with payments to those counties of $1.3 million. More recent 2013 county data is available for CREP that reports $4.2 million invested in coastal counties with 3009 acres enrolled.

Through the combination of Oregon's AWQM Program, CAFO Program, Conservation Effectiveness Partnership, Pesticide Stewardship Partnership, MOAs between ODA and DEQ, substantial private and public investments as well as recently expanded monitoring, assessments and enforcement through ODA's AWQM Program's Strategic Implementation initiative, Oregon has met the agriculture category condition.

Appendix A

Oregon's Submittal for Remaining Forestry Management Measures

For Approval of Oregon's Coastal Nonpoint Pollution Control Program

Originally submitted July 1, 2013 – Revised March 20, 2014

Background

In July 1995, Oregon submitted its Coastal Nonpoint Pollution Control Program to EPA and NOAA for review. At that time, forestry management measures were perceived by EPA and NOAA to be inadequate to protect and maintain water quality. Specifically, forest practices on non-federal land with regards to riparian area protections for small and medium fish bearing streams, small non-fish bearing streams, protections for landslide prone areas, management and maintenance of forest roads, and ensuring adequacy of stream buffers for application of certain chemicals were topics that needed to be further addressed in order to grant full approval of Oregon's Coastal Nonpoint Pollution Control Program.

In a May 29, 2013 email to Greg Aldrich (DEQ) and Patty Snow (DLCD), Christine Psyk (EPA) stated that "Oregon needs to explain how it intends to implement specific BMPs, backed by enforceable authority, to:

- protect medium, small, and non-fish bearing streams
- protect high-risk landslide areas
- effectively address the impacts of road operation and maintenance, particularly legacy roads; and
- ensure the adequacy of stream buffers for the application of certain chemicals."

Oregon's Response

Oregon will meet the objectives of these measures through a comprehensive, science-based program of regulatory and voluntary measures with an adaptive management loop that includes ongoing evaluation and course correction to ensure environmental outcomes can be achieved. The approach includes specific BMPs, but it is the overall approach that ensures that Oregon actions will achieve CZARA's objectives of reducing the pollution of coastal waters from nonpoint sources.

This submittal begins with a description of Oregon's regulatory and policy framework for

managing private forestlands to ensure the protection of water quality and associated beneficial uses. The submittal then describes, for each measure listed above, how the objectives for these measures are achieved through Oregon's comprehensive, adaptive management approach. Each section will describe the background on the issue; relevant monitoring data and scientific; current management measures, both regulatory and voluntary, and how those measures have changed over time in response to data on what is necessary to ensure water quality protection; the adequacy of the measures; and additional management measures to be implemented.

Oregon's Policy and Regulatory Framework for Protecting Water Quality on Nonfederal Forestland

Oregon's policy and regulatory framework for protecting water quality on nonfederal forestland relies on two main regulatory approaches augmented by voluntary measures and incentives. Oregon's strong land use laws, that maintain forestland in forest use, provide water quality protection by avoiding the negative impacts to natural resources from development. Statewide Planning Goal 4 – Forest Lands – keeps forestland from being divided into parcels too small to manage effectively for timber, habitat, recreation, watershed protection, and other purposes. Oregon's set of forest protection laws, the Forest Practices Act works in concert with land use laws to ensure economically efficient forest practices that ensure the continuous growing and harvesting of forest tree species and the maintenance of *forestland* for such purposes as the leading use on privately owned land, consistent with sound management of soil, air, water, fish and wildlife resources. The Oregon Plan for Salmon and Watersheds provides a framework for additional voluntary approaches to improve water quality outcomes on forestland. This three-tiered approach results in forestland having the highest water quality in Oregon.

Oregon's Land Use Program

Oregon's Land Use Program is fundamental to the protection of natural resources in Oregon. For more than three decades, Oregon has maintained strong protections for forestland as a primary land use. Statewide Planning Goal 4 – Forest Lands – calls for forestland to be conserved primarily for commercial timber production but also for other forest uses. Oregon's land use program places major emphasis on maintaining commercial forestland. Forestland zoning limits development that could conflict with forestry practices. It keeps forestland from being divided into parcels which are too small to manage effectively for timber, habitat, recreation, watershed protection, and other purposes. Lands in these zones may be eligible for forest tax assessment through the local county.

The main tool for carrying out the land use policy is the Statewide Planning Program. Oregon's Land Conservation and Development Commission (LCDC) sets standards for such planning. The cities and counties then apply the standards through local comprehensive plans and land use ordinances. Under this system, all counties in Oregon with forestland have adopted planning and zoning measures to protect forestland as a primary use. Oregon's program, first adopted in 1973, provides resource protection through the adoption of enforceable local comprehensive land use plans.

The Statewide Planning Program provides resource and water quality protection by slowing the largest threat to sustainable forestry, the conversion and fragmentation of forestland. As timber harvests have declined over the last two decades, forestland owners are increasingly under pressure to sell and/or develop their properties. The resulting fragmentation of the forestland base and introduction of dwellings into forestland settings creates challenges and risks for the management of adjacent forestlands for both timber and other forest uses and values. The presence of dwellings also increases the risk of fire danger both to forests as well as to other dwellings in the forest.

When forestlands are developed into urban and rural residential uses, it is accompanied by a decline in ecosystem services as compared to undeveloped or wildland forests (Smail and Lewis 2009). Increased housing density in forested areas and decreased parcel sizes can be associated with long-term modifications to, and reductions in, water quality and aquatic diversity when forests can no longer regulate the movement of storm water across the landscape, leading to changes in streamflows, increases in sediment, reshaped stream bottoms and banks, and impacts on water quality and aquatic species such as fish (Stein et al. 2005). A recent report by the US Geological Survey documents the decline in water quality associated with urban development on forestland (Coles et al. 2012).

Oregon's Forest Practices Act (FPA)

Oregon's public policy for forest practices regulation is to encourage economically efficient forest practices that ensure the continuous growing and harvesting of forest tree species and the maintenance of forestland for such purposes as the leading use on privately owned land, consistent with sound management of soil, air, water, fish and wildlife resources and scenic resources within visually sensitive corridors as provided in ORS 527.755 and to ensure the continuous benefits of those resources for future generations of Oregonians. Oregon's policy additionally recognizes that it is essential to avoid uncertainty and confusion in enforcement and implementation of forest laws and regulations and to provide a stable regulatory environment to encourage investment in private forestlands. To encourage practices that implement the FPA policy, Oregon has declared that it is in the public interest to vest in the State Board of Forestry (Board) exclusive authority to develop and enforce statewide and regional rules and to coordinate with other state agencies and local governments which are concerned with the forest environment (ORS 527.630).

The focus on economically efficient practices and stable regulatory environment support Goal 4 of the land use laws to maintain working forests. The focus on economically efficient practices is further sharpened in policy though the FPA rule process, which requires research or monitoring evidence that an actual problem exists, prior to the adoption of

additional restriction on forest practices (ORS 527.714). This prudent, rational approach to forest regulation directs the Board, when solving a problem, to consider a broad range of alternatives, including non-regulatory alternatives, and to select the least burdensome approach. The 2011 Forestry Program for Oregon reflects this policy and includes the following statement that the Board:

> *Supports an effective, science-based, and adaptive Oregon Forest Practices Act and a strong, but flexible, Land Use Planning Program as the cornerstones of forest resource protection on private lands in Oregon. The Board will use non-regulatory methods as much as feasible to achieve public-policy goals on private forestlands, and consider the use of additional regulatory methods only when non-regulatory methods are either not feasible or are not likely to achieve the desired outcome.*

This objective recognizes that regulatory approaches tend to be more costly than non-regulatory alternatives, and every increase in management cost increases pressure on economically marginal forestland to convert to non-forest uses.

The Board's economically efficient regulations require effectiveness monitoring to ensure rules and best management practices are adequate to protect resources. The Board oversees the FPA effectiveness-monitoring program to ensure data collection that informs the Board's adaptive management approach of establishing BMPs, monitoring effectiveness, and updating rules based on science. FPA rules specifically require monitoring in the areas of water quality, streamside forests (OAR 629-635-0110), pesticide use (OAR 629-620-0700) and landslides and public safety (OAR 629-623-0000). The Department of Forestry's (ODF) 2002 Monitoring Strategy prioritizes key questions as based on public input to promote efficiency in designing and implementing projects to assess the effectiveness of forest practices into the future.

ODF actively seeks to conduct monitoring and research in coordination with other agencies. These efforts include participation in the inter-agency Water Quality Pesticide Management Team. This team facilitates and coordinates monitoring, analysis and interpretation of pesticide data throughout the state and across all land uses, effective response measures, and management solutions. As the Designated Management Agency for maintaining water quality on forestland under the Clean Water Act, ODF coordinates monitoring and research projects with the DEQ to ensure success in meeting statewide environmental standards. ODF also participates in three paired watershed studies as part of the Watershed Research Cooperative (WRC). These efforts inform the adaptive management approach at multiple levels, challenging scientific assumptions via watershed- level research while simultaneously evaluating forest practices effectiveness at operational scales. The WRC creates and disseminates new knowledge about the

relationships between forest management and natural resources, particularly water-related resources, to address questions framed by policy makers and forest practitioners.

Effectiveness of Oregon's Approach of Maintaining Forestland to Protect Resources

While the nation as a whole is facing an alarming rate of loss of forestland, Oregon's integrated approach has been very successful at maintaining forestland. Nationwide, the total area of private forestland has been gradually declining since the mid 20th century. From 1982 to 1997, 10.3 million acres of nonfederal forestland, mostly private, were converted to developed uses and urban areas. This is the equivalent of 680,000 acres per year (Stein et al. 2005). The rate of conversion jumped to 1 million acres per year during 1992 to 1997, when 5 million acres of nonfederal forest land were permanently converted (Alig et al. 2003). In contrast, as of 2009, Oregon has maintained 98 percent of all nonfederal land and 98 percent of private land that was in forest, agricultural, and range land uses in 1974. While forestland conversion rates were stable overall, the change in the area in wildland forest use in Oregon varied by landowner class between 1974 and 2009. The area of land in wildland forest use owned by forest industry and by other public (non-Federal) owners remained nearly constant. However, land in wildland forest use owned by other private owners declined 6 percent in Oregon, specifically, 8 percent in western Oregon, and 3 percent in eastern Oregon (Lettman et al. 2011).In evaluating Oregon's forestry management measures, the EPA and NOAA refer to Washington state Forest and Fish Report rules as providing "substantial increases in fish stream protection, non-fish stream protection, protection for high risk landslide prone areas, and a comprehensive forest roads program." While the Forests and Fish rules provide in some cases buffer widths two to three times as wide as some of the widths under the FPA, the actual difference in the riparian protection function as compared to the FPA is limited, and is provided at much higher cost to landowners (Zobrist 2005). The caucus that drafted the recommendations recognized that the proposed rules would have significant economic impact, especially on small landowners (Zobrist and Lippke 2003). While Washington established a compensation program for small landowners, the program was vastly under-funded for anything but low participation rates. Furthermore, the compensation program did not mitigate the loss in bare forestland value, which is the ultimate motive for maintaining land as forestland (Lippke 2001). Washington's family forestlands represent over half of the total private forestland acres in the State, and are lower in elevation than industrial forestlands; these parcels are often found in the spawning regions of many of Washington State's salmon streams. The biggest losses in the Puget Sound area are caused by sprawling development and conversion of forestlands. Twenty-five percent of working forests in Puget Sound were converted out of forest to development and other uses between

1988 and 2004 (Goldmark 2010).

Oregon has been more successful in retaining forestland relative to Washington. In the western parts of the states, Oregon and Washington have been similarly successful in maintaining industrial forestland, 0% and 1% loss, respectively. However, western Washington has lost 23% of family forestland, compared to 8 % loss of family forestland in western Oregon. Figure 1 shows the percent of 1974 forestland in the coastal zone management areas (6217) part of the states remaining in forest for Oregon and Washington[2].

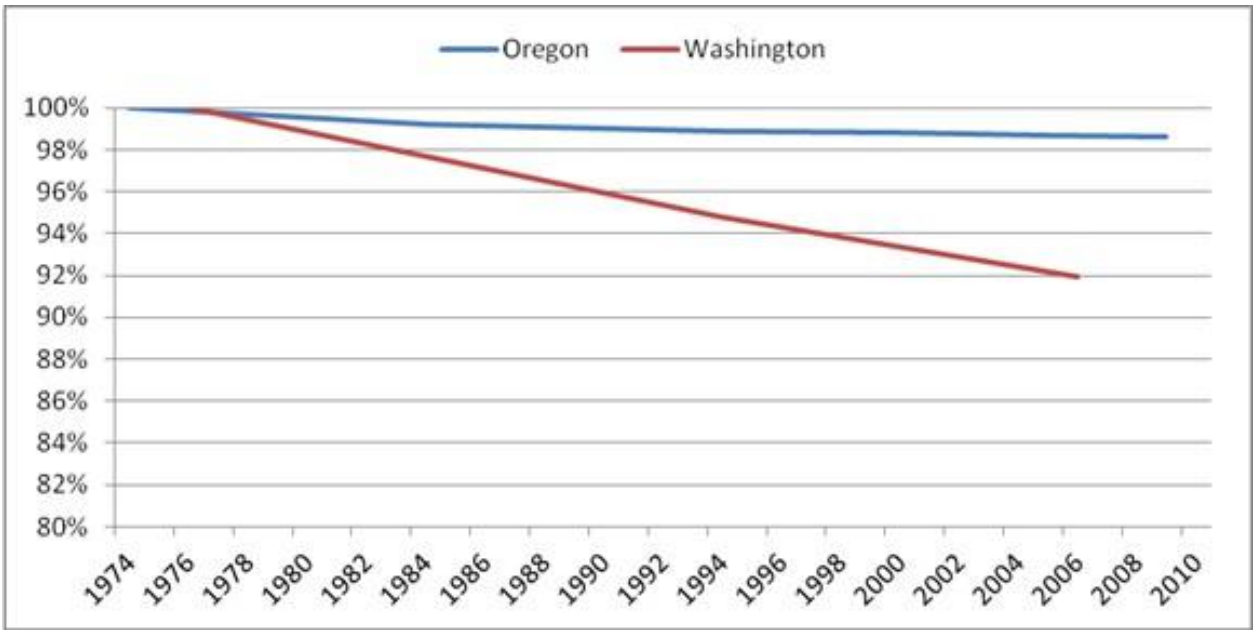

Figure 1: Percent of 1974 forestland in coastal zone management areas remaining in forest for Oregon and Washington

Table 1 shows the change in acres and percent of land use change by land use categories in the coastal zone management areas (6217) for Oregon and Washington. Oregon has been more successful in retaining all resource lands relative to Washington. In regards to forestland, Washington has lost over 400,000 acres compared to Oregon's 40,000 acres. The majority of the conversions in both states have been to Low-Density Residential and Urban land uses. However, Washington shows a much higher conversion to Urban. See Figure 2 for a spatial representation of the resource land conversion in Oregon and Washington coastal zones.

[2] Data, analysis, and figures prepared by Gary Lettman and Andy Herstrom, Oregon Department of Forestry, and Joel Thompson, USDA Forest Service, Pacific Northwest Forest Inventory and Analysis.

Table 1: Land Use Change in the Coastal Zone Management Areas (6217) for Oregon and Washington.

	Washington		Oregon	
	Change 1974-2006		Change 1974-2009	
Land Use	Acres	Percent	Acres	Percent
Wildland Forest	-424,028	-7%	-40,325	-1%
Mixed Forest/Ag	-72,040	-29%	-4,172	-4%
Intensive Ag	-132,206	-21%	-2,781	-2%
Low-Density Residential	415,168	53%	43,106	33%
Urban	212,624	63%	4,635	11%
Other	482	1%	-464	-2%
Total Resource Land	-628,274	-9%	-47,277	-1%

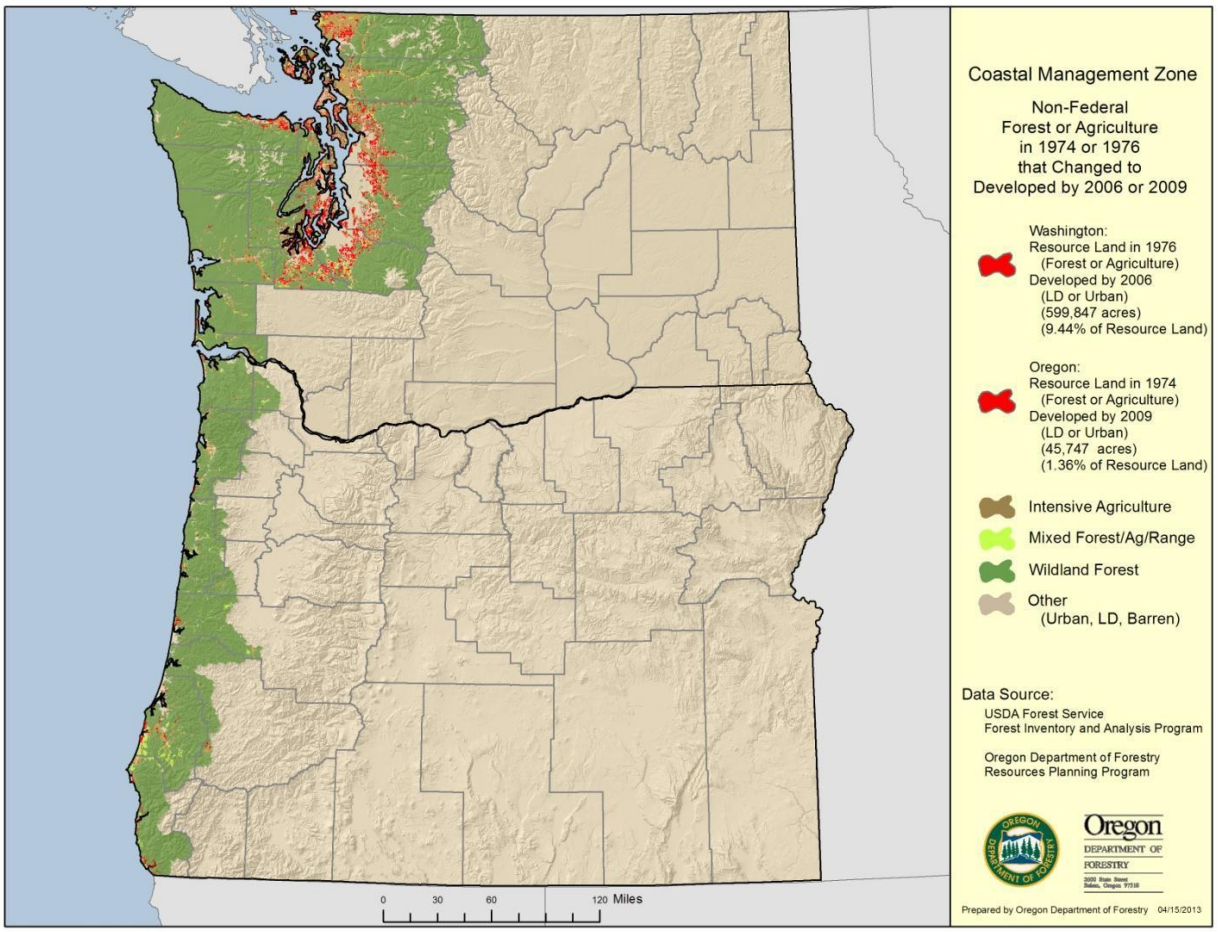

Figure 2: Resource land conversion in Oregon and Washington Coastal Zone Management Areas

While Oregon's land use laws have been effective, the Board has identified the current and future risks of forest fragmentation (i.e., increasing density of structures and parcelization) and the conversion of forests to non-forest use as the primary, overarching challenge to sustainable forestry and keeping working forests working. Oregon's private forests at risk of parcelization and/or conversion have significantly expanded in recent years. As development pressures, population growth, and real estate values increase, more forestland will be at-risk of conversion. An estimated 330,000 acres of Oregon's forestland—about 5 percent of the state's private forestland—exist inside urban growth boundaries or other development zones. Another 1.8 million acres of private forestland exist within one mile of developable areas. The majority of these acres are in family forestlands.

Oregon's 4.7 million acres of family forestlands (44 % of private forestlands) provide key functions for rural landscapes, societies and economies. These lands dominate the urban

and wildland-urban interfaces areas, comprising 80% (1.7 million acres) of the private forests in these areas. Family forestland ownership acreages are generally smaller in size, their objectives and land uses are varied, and their forestland is diverse. There are 87,000 family forests in the 1-9 acre size and another 69,000 family forests in the 10-500 acre size class. As forestland value often exceeds timberland values, family forestland owners are under economic pressure to convert their forestland to non-forest use. Many family forestlands are also shifting ownership to the next generation of family members.

Much of Oregon's family forestland occupies ecologically important, lower elevation settings, often near residential areas. In the coastal zone, 81 percent of the area adjacent to high-intrinsic-potential stream reaches (areas with potential high quality fish habitat) for coastal coho salmon is privately owned, with the majority being in family forestland ownership (Burnett 2007). Past management appears to have concentrated family forestland ownership, agriculture, and developed uses adjacent to these reaches. By the late 1800s, extensive alteration of stream channels, floodplains, and forests along most major Pacific coastal rivers may have particularly impacted coastal coho salmon habitat on family forestlands, reflected in the smaller volumes and fewer pieces of large wood compared to streams on other ownerships

As in Washington State, smaller landowners experience larger economic impacts from new forest practice regulations. Because of their geographic location near streams, the differential impacts are even more pronounced with current and additional water quality regulations. Given their critical location in the coastal zone, additional management measures, particularly measures that come with a high economic impact for a marginal change in water quality, may be counterproductive. These social and economic impacts will strain Oregon's land use program, and will result in significant conversion of forestlands to developed uses.

Oregon Plan for Salmon and Watersheds

Executive order 99-01 established the Oregon Plan for Salmon and Watersheds (OPSW, implemented as ORS 541.985). This uniquely Oregon approach to improving water quality, salmon habitat, and watershed health is an overarching plan that prioritizes necessary actions throughout Oregon for restoring and protecting watershed health and function thus providing for a resilient ecosystem. The Oregon Plan is meant to achieve healthy salmon populations and water quality with a major goal of not only removing salmonids from threatened and endangered status but recovering populations to an historic abundance. The Oregon Plan allows limited resources to be invested in locations with the highest potential for habitat improvement. With the Oregon Plan, landowners and land management agencies now have a tool to describe necessary actions to be accomplished and locations where those actions will provide the highest benefit to the resource to achieve the greatest economic

efficiency. Oregon would like to better capture and evaluate the implementation and effectiveness of voluntary measures to demonstrate their effectiveness for resource protection and restoration.

The Oregon Plan achieves environmental outcomes by using a flexible approach to implementation. As is often the case, a regulatory approach as compared to a voluntary approach such as the Oregon Plan, will often result in additional rules and processes for land management. Additional rules and processes result in additional restrictions for land management and landowners. In the best case, additional restrictions may cause some landowners to forgo voluntary restoration efforts for fear of additional regulation and in the worst case additional restrictions may cause some landowners to sell and develop property into other, less beneficial, land use with respect to water quality, salmon habitat, and watershed health. By allowing flexible approaches to implementation, landowners can take diverse paths to achieve the desired outcomes. Some landowners may choose to implement in-stream large wood placement actions to improve stream complexity in a highly degraded stream reach. Meanwhile, a neighboring landowner may choose to inventory a road system and invest in improving fish passage at undersized culverts to increase access to existing high quality fish habitat. It should be noted that the Oregon Plan helps achieve this vision by engaging landowners and land management agencies with voluntary restoration funding that might not be available if additional regulations were placed on these activities.

The executive order also directed Oregon to complete a comprehensive review of current forest practices in regard to state water quality standards and the protection and restoration of salmonids. This comprehensive review, the Sufficiency Analysis (ODF and DEQ 2002), coupled with recommendations of from the Independent Multidisciplinary Science Team (IMST 1999) and Forest Practice Advisory Committee (ODF 2000) identified additional forestry measures to address gaps in current FPA rules and BMPs that may lead to potential negative impacts from forest activities near streams.

The Board formally completed addressing all rule concepts identified in the FPAC report on April 2009[3] with the inclusion of the remaining two rule concepts in and endorsement of the Oregon Plan for Salmon and Watersheds voluntary measures (Morgan 2012). While the April meeting closed the FPAC process, the Board's ongoing adaptive management process, including policy analysis, rules and BMPs review, research, and monitoring frameworks, continues with ongoing review and improvement of forest practices resources protection

[3] See Board of Forestry archives and meeting materials for agenda topics C and 2, available at http://www.oregon.gov/ODF/Pages/board/BOF_042409_Meeting.aspx (last accessed June, 13, 2013).

issues. Key examples include the ongoing Watershed Research Cooperative[4] paired-watershed studies at Hinkle Creek, Trask River, and Alsea Revisited, the ODF RipStream study, and the Board's rule analysis on small and medium fish streams.

[4] See Watershed Research Cooperative website for more details, http://www.watershedsresearch.org/ (last accessed June, 13, 2013).

ISSUE: Protect Medium, Small, and Non-Fish Bearing Streams

Background

As described above, executive order 99-01 directed Oregon to complete a comprehensive review of current forest practices in regard to state water quality standards and the protection and restoration of salmonids. The Statewide Evaluation of Forest Practices Act Effectiveness in Protecting Water Quality (ODF and DEQ 2002) identified additional forestry measures to address gaps in current FPA rules and BMPs that may lead to potential negative impacts from forest management activities near streams. The analysis concluded that, with respect to all applicable standards (temperature, sedimentation, turbidity, aquatic habitat modification, and bio-criteria):

> *Standards for some medium and small Type F streams in western Oregon may result in short term temperature increases at the site level. However, the significance and scope of this increase is uncertain, and it may be offset at the landscape scale by other factors. Relevant to the habitat modification standard and criteria, large wood potential for some of these streams are less than what was assumed under the 1994 rules.*
>
> *Standards for some small Type N streams may result in short-term temperature increases at the site level that may be transferred downstream (this may impact water temperature and cold-water refugia) to fish-bearing streams. The significance and scale of this change is uncertain, and it may be offset at the landscape scale. Relevant to the habitat modification standard and criteria, large wood potential delivered by debris torrents (typically in areas of very steep topography) along these streams may be less than optimal.*

Oregon's concerns were consistent with the 1998 Findings for the Oregon Coastal Nonpoint Program (NOAA and EPA 1998). Under Section X, "Critical Coastal Areas, Additional Management Measures and Technical Assistance" the NOAA and EPA found:

> *Under existing State forest practices, medium, small, and non-fish bearing streams may be subject to loss of sediment retention capacity, increases in delivery of fine sediments, and increases in temperature due to loss of riparian vegetation. Another concern is provision of adequate long-term supplies of large woody debris in medium, small, and non-fish bearing streams, a shortage of which can result in decreased sediment storage in upstream tributaries, increased transport and deposition downstream, and overall adverse impacts to beneficial uses.*

As described above, Oregon remains concerned regarding the adequacy of forest practices

for protecting streams and maintaining water quality. The Board has completed implementation of the sufficiency analysis recommendations, and has continued to address water quality as a high priority topic. Ongoing research and monitoring are informing a public process for adapting forest practices rules and BMPs.

Forestry Management Measures for Stream Protection

Non-Fish Bearing Stream Protections – The FPA contains language that prescribes management measures which protect small non-fish bearing streams from potential impacts during forest management activities (OAR 629-630-0700 (5), 629-630-0800 (2)), stream crossings (OAR 629-630-0800 (4)), and requires vegetation retention in certain instances (OAR 629-640-0200 (6)).

In addition, the FPA requires prompt reforestation after harvest along small non-fish bearing streams (OAR 629-610-0040 (2)). This requirement ensures rapid recovery of riparian protection provided by forest tree species. An exception to prompt reforestation does exist however when an approved land use change is filed. When forestland is converted to another land use incompatible with forest tree species a different set of land use laws and riparian protections would apply.

Riparian Management Areas (RMAs) Upstream of Artificial Barriers –In 2007, the Board adopted new rules that apply to streams classified as non-fish bearing as a result of an electrofishing survey upstream of a man-made barrier to fish migration. The new rule stated that the upstream portion of the stream should be correctly classified as fish-bearing (Type F), upstream to the first natural barrier. This rule change closely aligns with stream crossing improvements being completed as a result of voluntary or regulatory measures and preserves an intact RMA to benefit fish and water quality when upstream habitat access is restored. The Board also adopted a rule that allows fish presence/absence to be determined by the use of field-based physical habitat criteria surveys in addition to electrofishing field surveys. Use of the physical habitat criteria is likely to result in more conservative estimates, in terms of fish use miles, of the end of fish use.

Voluntary Management Measures for Stream Protection

High Aquatic Potential (HAP) Streams – The Board adopted a new voluntary measure in 2009 that clearly describes physical stream characteristics that have the highest potential to benefit fish habitat by the active placement of large wood or other in-stream structures. This voluntary measure compliments the 2003 Board decision to approve additional voluntary measures designed to increase stream complexity through active in-stream wood placement and voluntary tree retention in the RMA's of fish bearing streams. Additional voluntary measures include a 60% basal area cap for medium and small fish bearing streams, no harvest within ½ of the RMA width, and retaining the largest trees in the RMA. The Board also approved adoption of a voluntary measure to promote managing large and medium non-fish bearing stream buffers the same as large and medium fish bearing stream buffers.

Small and Medium Fish-bearing Rulemaking

Currently, the Board is conducting a rule analysis process for riparian protection standards for small and medium fish bearing streams. The rule objective is: "Establish riparian protection measures for small and medium fish-bearing streams that maintain and promote shade conditions that insure, to the maximum extent practicable, the achievement of the Protecting Cold Water criterion." The rule analysis was initiated in response to results from ODF's Riparian Function and Stream Temperature (RipStream) effectiveness monitoring project. RipStream is designed to monitor the effectiveness of stream protection rules as prescribed for State Forests and private forestlands. RipStream study sites are located throughout the Coast Range geographic region on small and medium sized fish-bearing streams. Currently, all 33 sites (18 Private and 15 State) have at least three years of post-harvest data and most sites have complete data sets (5-years post) for stream temperature, shade and channel data.

The first effectiveness analysis (Groom et al. 2011a) focused on a strict regulatory perspective of stream temperature and evaluated RipStream sites for effectiveness in meeting stream temperature standards. The analysis evaluated DEQ temperature standards, with respect to the Protecting Cold Water Standard (PCW). For the PCW standard, timber harvests on state forests did not exceed the PCW more frequently than expected under natural background conditions (5%).On private lands, Timber harvests designed to the meet the FPA riparian protection standards for Medium and Small Type F streams exceeded the PCW at a greater frequency than would be expected by chance (40 % vs. 5 % for all other stream reaches). Note: because of stream temperature complexity, this analysis estimated the probability of an exceedance of the PCW criterion across pre-harvest to post-harvest treatment reach year-pair comparisons, and cannot be used to estimate the percentage of sites that exceeded the PCW or the magnitude of temperature change. The analysis indicated that all study sites performed well in regard to the maximum temperature thresholds established by the Biological Numeric Criteria standard (16° C, 18° C) an additional peer-reviewed journal article regarding the Biological Numeric Criteria is pending.

A second analysis (Groom et al. 2011b) examined the magnitude of the expected change. At sites managed to FPA standards, maximum temperatures increased after harvest by an overall average of 0.7 °C. Sites exhibited variability in responses; some sites increased by 2.5 °C while other sites declined by 0.9 °C. The average change in maximum temperatures for state forest sites was 0.0 °C, and supported temperature models that considered state forest post-harvest years to resemble pre-harvest conditions. In turn, overall shade declined

post-harvest at private sites but not at state sites.

Based on these results, the Board determined that the there is monitoring or research evidence that documents the degradation of resources maintained (i.e., that there is evidence that forest practices conducted under existing regulations do not insure forest operations meet the state water quality standard for protecting cold water on small and medium fish streams). The Board directed the department to begin the rule analysis process that could lead to revision of the riparian protection standards to increase the maintenance and promotion of shade on small and medium fish streams. Currently, the process for potential increase in basal area and/or riparian management area widths is under discussion with the Board and will follow Oregon's public policy process under ORS 527.714. In November 2013, ODF staff presented the results of a systematic review of science related to the rule objective and the Board limited the number of alternatives to those supported by the science. The board will review preliminary model results for developing new prescriptions (BMPs). The rule analysis is expected to be completed by end of 2014. The Board of Forestry has the legal authority to regulate forest practices through administrative rule making for the protection of water quality.

Ongoing Monitoring Efforts Small and Medium Fish-bearing Streams

The main objective of the RipStream project is to evaluate the effectiveness of FPA forest practices rules and State Forests' management strategies at protecting stream temperatures and promoting desired riparian structure. Most of the focus to date, including the ongoing riparian rule analysis process, has been on the effectiveness of FPA and the State Forest Northwest Forest Management Plan (NWFMP) riparian protections for stream temperature. Further analyses are planned on the following topics:

- Analysis of stream temperature and shade response one to five years post-harvest.
    - Preliminary results were presented to the Board in November 2011. A draft manuscript describes the results but has not yet been finalized.

- Analyses of downstream temperature outcomes following forest harvest.
    - The RipStream study does not address effects of multiple harvest units but results can provide inferences about how far downstream a single harvest unit can influence stream temperature. The Department currently has a contract with two external scientists to complete analyses of the downstream data. The analyses focus on downstream temperature outcomes, the thermal dynamics of heat transfer processes, and potential biological impacts.

- Large wood recruitment.

- A conference proceedings on a case-study of a State Forests RipStream site using the OSU Streamwood model will be published soon. Future analysis on a broader scope of sites is planned with input on methodology from the RipStream external technical review team. ODF Private and State Forests staff are currently collaborating on how this analysis will take place.

- Riparian stand characteristics and functions.
  - Future analyses will examine RipStream data sets in relation to the purpose and goals of the riparian rules and strategies for riparian structure and function as laid out in the FPA and NWFMP. This work may take place in concert with the large wood recruitment analysis.

Ongoing Monitoring Efforts Non Fish-bearing Streams

"Small Type N" is an Oregon regulatory label for very small, non fish-bearing, headwater streams. While the body of information is growing on these very small streams, the definition for "headwater" streams varies, such that some of the available studies may actually be looking at the equivalent of "Medium" streams as defined by Oregon. Small Type N streams make up the majority of the stream network (estimates range from 70-90%) in most Oregon regions. Responses to harvest are highly variable in characteristics, functions, and relative influence on downstream reaches. Reasons cited in the literature for variable responses to harvest include:

- Even without harvest water quality, sediment, wood loading, nutrient (etc.) patterns tend to be highly variable which can make it difficult to detect a harvest response, especially if the harvest effect is small;
- Ground water (which tends to remain stable/water quality not influenced by harvest) comprises a larger percentage of their surface water than in larger streams which can moderate harvest responses;
- Spatially intermittent streams with coarse gravels tend to be thermally non-responsive;
- Narrow channels can be shaded by grasses, ferns, shrubs, channel banks which may reduce the importance of overstory shade.

The influence of Small Type N streams on downstream reaches has not been well documented. The WRC Paired Watershed Studies (Hinkle, Alsea, and Trask) are well situated to test hypotheses related to harvest effects on site as well as downstream. Results from the Hinkle Creek paired watershed study support the variable

temperature response of non-fish bearing stream to harvests under forest practices standards. This study also did not detect a significant change in temperature from the four harvests at the watershed outlet (Kibler 2007).

Oregon continues to participate in the Oregon Watersheds Research Cooperative (WRC) at the OSU College of Forestry. Housed and led by OSU, The WRC conducts multi-agency, adaptive management, watershed research projects, including the Hinkle Creek, Trask River and Alsea paired watershed studies. Cooperative members include state and federal agencies, forestland owners, and other organizations. The WRC specifically examines the effectiveness of State Forests Forest Management Plan (SFMP) strategies and FPA standards to maintain and protect headwater stream processes and conditions. The Trask River Watershed Study is evaluating how small streams respond to forest harvest and if responses are carried downstream. The research evaluates water quality effects in small non-fish and fish bearing streams, and determines the process-level links between harvest related water quality effects to the biological effects on fish and other biota. The study uses a whole-watershed, integrated design that links biological with physical studies in order to document responses and evaluate ecological tradeoffs. Information will help guide policy and management decisions in an adaptive management context for both state and private forests to determine if current management achieves goals for aquatic conservation. Oregon has committed annual fiscal and technical support to ensure completion of this study for the past eight years.

The paired watershed studies and other monitoring programs demonstrate the State's commitment to a continuous learning and adaptive management approach to forestry best management practices. The state will use this important research and other information to ensure a science-based analysis of the effectiveness of current measures on non-fish bearing streams.

ISSUE: Protect High-Risk Landslide Areas

Background

In the 1998 Findings for the Oregon Coastal Nonpoint Program, in Section X, "Critical Coastal Areas, Additional Management Measures and Technical Assistance," the NOAA and EPA found:

> *Regarding concerns with harvest activities in high risk landslide areas, evidence indicates that timber harvests on unstable, steep terrain can result in increases in landslide rates of approximately 200 to 400 percent. There are also indications that a relatively small proportion of potentially unstable ground in the Oregon Coast Range is responsible for the majority of landslides in Oregon.*

In 1996, Oregon experienced two very large storm events that produced hundreds of landslides throughout Western Oregon and parts of Northeast Oregon. The department engaged in a three year monitoring study designed to evaluate the accuracy and precision and remote-sensing data for landslide identification, determine landslide frequency and channel impacts, and determine the relationship between storm impacts and forest stand structure. The study (Robison 1999) focused on areas representing the most severe impacts from the 1996 storms. Therefore, results from "red zones" do not represent the average forestland responses to these 1996 storms. In addition, by only measuring landslides that resulted from the February and November 1996 storms, the study focuses on individual storm events and results cannot be extrapolated to predict long-term conditions.

The study reported key points that help explain the relationship between storm intensity, characterized by a "return interval" and the frequency of landslides. The majority of landslides were not associated with roads; slopes of over 70% to 80% (depending on landform and geology) had the highest hazard for shallow rapid landslides. Concave shaped slopes appear to be more susceptible to landslides than other landforms. The study used analysis of variance to test landslide density differences between the four age classes (0–9, 10–30, 31–100, and 100+-year-old forests) on the four multi-age red zone study areas. Partly because of the small number of study areas, there is no significant difference for the four study areas between the four age classes. In three out of four study areas in very steep terrain landslide density was greater in stands 0–9 years old (19.2/mi^2). On the other hand, stands between 10–30 and 31–100 years in age typically had lower landslide densities (9.0/mi^2 and 7.9/mi^2, respectively) as compared to forest stands older than 100 years (13.5/mi^2). The study also determined that landslides in clearcuts are not different in size than landslides in older forests.

Results from this work led to revisions in the FPA regarding identification of landslide prone

areas and implementing specific BMP's designed to mitigate the risk of forest harvest on landslides in regard to public safety (629-623-0000). The study results applied in this case, because the criterion was the change in public safety risk from current condition for a specific site, given the probability of a storm event.

For water quality concerns, the analysis needs to be applied at an appropriate landscape scale. While one could postulate that the 1999 study results imply that forest management lowers the landscape-scale risks because a greater proportion of the landscape is in the 10-30 age class compared to unmanaged forests, that conclusion extrapolates study results to predict long-term conditions and the study should not be extrapolated to predict long-term conditions

Montgomery et al. (2000), examined landslide rates in some of the steepest and least stable terrain in the Oregon Coast Range. They found that landslide sensitivity was dependent on a combination of slope steepness and topography and storms of less than a 4-year recurrence interval triggered landslides in the decades after timber harvest. They also developed a model to estimate regional landslide rates based on mapped landslides from 14 industrial forest watersheds assessed under the Washington State watershed analysis methodology. The distribution of mapped landslides indicated that rates of shallow landslides varied dramatically between the watersheds. The model estimated that the contemporary landslide rate was 3-9 times higher than the estimated background rate for the Oregon coast.

An unusually powerful storm in 2007 resulted in record flooding and thousands of landslides across southwest Washington and northwest Oregon. This event provided the opportunity to examine the effects of both natural factors and forest management practices on landslide density. The study (Turner et al. 2010), examined associations between landslide density, precipitation, topography, and forest stand age across a 152,000 ha forested landscape in Washington. The study found that very few landslides occurred in areas with less than or equal to the 100-year rainfall category, regardless of stand age or slope gradient class. At higher rainfall intensities, significantly higher landslide densities occurred on steep slopes (>70% gradient) compared to lower gradient slopes, as expected. Above 150% of 100-year rainfall, the density of landslides was 2–3 times larger in the 0–5 and 6–10 year stand age categories than in the 11–20, 21–30, 31–40, and 41+ categories. The effect of stand age was strongest at the highest rainfall intensities. The study noted that because it evaluated the distribution of landslide densities for a single storm in an area with highly variable terrain, landslide histories, and historic land use practices, the results cannot be extrapolated to estimate long-term landslide rates, including ''background'' rates for unmanaged forest lands, or the effects of specific current forest management practices relative to past practices, within or outside of the study area.

Oregon recognizes that landslides and debris flows are an important ecological disturbance agent and sediment transport process in coastal-zone forests. These processes deliver sediment and woody debris to downstream channels, often creating log jams where they deposit. While the effects of debris flows can adversely impact salmonids, debris-flow deposited log jams are also necessary habitat-forming agents for salmonids. The State will use existing and emerging research to further our understanding of the human-caused influence on the occurrence of landslides to inform further discussions.

Forestry Management Measures for High Risk Landslide Area

Protection along Debris Torrent-Prone Streams - Streams that occur on debris torrent-prone slopes are subject to additional management measures to ensure that effects from forest operations do not increase public safety risk and that, where appropriate and as directed by the state forester, to leave standing live trees along the channel to slow debris torrent movement downstream. Additional BMP's in effect with this rule are designed to decrease slash loading in the stream channel by felling trees in a manner to minimize slash and other debris accumulations in the channel and to remove logging slash piles and continuous logging slash deposits. Additional BMPs also apply where small Type N streams may be subject to rapidly moving landslides. The stream protection rules require that operators leave green trees and snags in these areas to provide a source of large wood for fish bearing streams.

Voluntary Management Measures for High Risk Landslide Area

Leave Trees on Landslide Prone Slopes - In addition to the regulatory landslide and public safety rule is a voluntary measure under the OPSW. This voluntary measure is designed to give landowners credit for leaving standing live trees that otherwise meet the requirement for the mandatory leave tree requirement along landslide prone slopes. The intent of this measure is to provide a future source of large wood that will be deposited into a stream channel if a landslide does occur. Large wood in streams contributes to the formation of stream complexity, which is a key limiting factor for coastal coho salmon.

ISSUE: Effectively Address the Impacts of Road Operation and Maintenance, Particularly Legacy Roads

Background

The Forest Practices has three definitions for three types of roads: Active, Inactive and Vacated. Based on legal advice and department guidance, any road used for forest management access since the effective date of the Forest Practices Act in 1971 falls into one of these categories. Active and Inactive roads must be maintained as needed to protect water quality as per the BMPs described under OAR 629-625-0600. A vacated road must be stabilized for permanent drainage and slope stability. If it is not stabilized, it is not a vacated road, and falls under the maintenance requirement for an inactive road.

Sufficiency of Forest Road Management Measures

As described above, executive order 99-01 directed Oregon to complete a comprehensive review of current forest practices in regard to state water quality standards and the protection and restoration of salmonids. The Statewide Evaluation of Forest Practices Act Effectiveness in Protecting Water Quality (ODF and DEQ 2002) concluded that current (except for measures described below) road related BMPs are likely to maintain water quality standards if implemented in compliance with the FPA. Initial results from the Trask Watershed Study show little to no impact of road crossings on stream turbidity when roads are constructed and maintained according to FPA rules. Results from 2002 compliance monitoring showed high levels of compliance with road related rules.

The following four paragraphs provide a brief summary of the additional forestry measures developed in response to the recommendations in the sufficiency analysis. These enforceable administrative rules were adopted by the Board of Forestry through Oregon's current public policy process. Additional OPSW voluntary measures have also been recommended by the Department and approved by the Board (see below).

<u>Critical Locations Policy</u> – In 2002, the BOF approved management measures for avoiding roads in critical locations. Critical locations include high landslide hazard locations, slopes over 60 percent with decomposed granite-type soils, within RMAs or within 50 feet of stream channels or lakes, or within wetlands. These are locations where direct impacts to streams are likely even when the best forest road building techniques (the road design and construction rules) are used correctly. See "Avoiding Roads in Critical Locations," Forest Practices Technical Note Number 7, 2003 (ODF 2003).

<u>Wet-weather hauling</u> – Additional rules designed to prevent adverse impacts from road related sediment delivery occurring during wet periods associated with log hauling

activities were adopted by the BOF in 2003. This new rule requires landowners to provide durable road surfacing, or other measures to prevent sediment delivery to waters of the state. It also allows the state forester to require that a landowner cease hauling activities if sediment delivery from log hauling activities results in visible turbidity increases in an adjacent stream.

Ground based harvesting on steep slopes – A new rule, designed to reduce the potential of sediment delivery from steep, erosion prone slopes was adopted by the BOF in 2002. This rule applies to ground based harvesting operations and specifies conditions and BMP's that shall be followed to maintain water quality and beneficial uses.

Road drainage – The department evaluated and revised the existing rule on road drainage to provide clarity on the priority of corrective BMP's to reduce potential sediment delivery. An additional rule was added that allows the state forester to require installation of additional cross drains prior to hauling for prevention of sediment delivery to waters of the state. These rules were adopted in 2003.

With the addition of these regulatory management measures described above, Oregon has identified effective BMPs for road siting, construction, operation, maintenance, abandonment, and closure to ensure road stability; drainage of road runoff back to the forest floor rather than directly to streams and other water bodies; and adequate protection of all waters of the state.

Legacy Forest Roads

The Federal government has indicated that they remain concerned about the adequacy of forest road measures to effectively address the impacts of road operation and maintenance, *particularly legacy roads* (emphasis added). The NOAA and EPA (1998) define "Legacy forest roads" as, "roads constructed and used prior to adoption of the FPA and not used and maintained since then) were not required to be treated and stabilized before closure. In some locations, this has resulted in significantly altered surface drainage, diversion of water from natural channels, and serious erosion or landslides."

A former road that has not been used for forest management access since 1971 will likely be covered with trees and other vegetation, have fills which were washed out by the many high flows over the last 40 years, and based on ODF state forests road surveys actually be less connected to streams (less of a risk of chronic erosion) than active or inactive roads. Legacy roads may still have locations at risk of landslides. However, to access and repair these roads requires clear cutting the trees on the road prism, reconstruction of washed

out sections, and then removal of these reconstructed sections. All of these activities will increase chronic erosion for the sake of reducing potential episodic erosion.

In more recent communication, the EPA extended the definition of legacy roads to include "forest roads that do not meet current State requirements with respect to siting, construction, maintenance, and road drainage. Legacy roads could be temporarily (abandoned) or permanently (orphaned) not in use or include forest roads currently being used for active silvicultural operations. The definition of legacy road is less important to EPA than having a State CNPCP that ensures the subset of forest roads contributing to water quality or beneficial use impairment are identified and addressed within a reasonable timeframe" (June 4, 2013 email from David Powers, Regional Manager for Forests and Rangelands).

Roads with attributes that do not meet current State requirements for siting, construction, and road drainage are addressed through OPSW voluntary measures, backed by enforceable authority.

Voluntary Forest Road Management Measures

With the advent of OPSW, private and state forestland owners implemented efforts to improve water quality, including the road risk and remediation program (ODF-1 and 2). Under this effort, forestland owners surveyed roads to identify 11 risks that the roads may pose to salmonid habitat. Risks were identified and prioritized for remediation following an established protocol.

As of 2011, private forestland owners have invested over $93 million in OPSW voluntary measures, as documented by the Oregon Watershed Restoration Inventory. These voluntary efforts continue; between 2004 and 2011, inclusive, industrial forestland owners (accounting for 6.0 million acres) have invested over $24 million, and non-industrial (primarily family forestland owners with 4.7 million acres) have invested $2 million. Oregon recognizes the challenge with family forestland owners, who often do not have capital resources to address costly road remediation. As of 2010, forestland owners have surveyed over 16,000 miles of roads, and have completed significant improvements (see Table 1).

Table 1: Statewide Summary of Forestry Accomplishments on Private Forest Lands (1997-2010)

Activity	Reported Accomplishments
Road Miles Surveyed	16501
Road Miles Improved	3241
Road Miles Vacated, Closed or Relocated	547
Number of Peak Flow Improvements	7863
Number of Surface Drainage Improvements	18222
Number of Stream Crossings Improved for Fish	1696

Based on projects completed and reported to the Oregon Watershed Restoration Inventory

These OPSW voluntary measures are backed by enforceable authority under ORS 527.990 criminal penalties and ORS 527.992 civil penalties. Current rules allow for enforcement actions on active, inactive or improperly vacated roads that are at risk or currently deliver sediment to waters of the state (for example see above discussion of road drainage). EPA is concerned that only road construction or reconstruction activities will provide the trigger for improving road drainage (from 1998 and 2004 interim decision). However, as implemented by the Board of Forestry in Administrative Rules (OAR 625 Division 670), the State Forester may initiate enforcement action by issuing and serving a written statement of unsatisfactory condition to the landowner or operator when timely corrective action is needed to eliminate the potential for resource damage or other consequences from any active or inactive road. A written statement of unsatisfactory condition identifies the nature of the unsatisfactory condition (e.g., plugged culvert or log puncheon), the corrective action to be taken by a specific date, and a notice that a citation will be issued if damage results before corrective action is completed, or if corrective action is not completed by the specific date. While Oregon prefers to work collaboratively with forestland owners on road remediation, Oregon does issue statements of unsatisfactory conditions, and civil penalty violations if warranted.

Ongoing Evaluation of Forest Road Management Measures

In 2011, as directed by the legislature, Oregon undertook a third-party evaluation of administration of the Forest Practices Act. Oregon redesigned the notification and inspection process, which has increased the number of field inspections to ensure implementation and compliance with rules and BMPs. Oregon has instituted an annual audit to measure compliance with the FPA. This year's audit focuses on measuring compliance with rules that govern forest road construction/maintenance and timber harvesting regulations. The audit will also examine selected rules related to planning forest

operations, protecting water resources, and harvest operations near streams and waterways. Results of the audit will be used to help focus educational and training programs related to FPA implementation.

Voluntary reporting of OPSW voluntary measures has diminished in past years, however it is reasonable to assume that voluntary measure implementation has not. Additional effort is planned to increase knowledge of OPSW voluntary measures that currently exist and to encourage landowners to voluntarily report their activities to the Oregon Watershed Restoration Inventory (OWRI). Future training will help increase voluntary measures implemented and the number of reported projects. In addition, core business function improvements within ODF may lead to an opportunity to educate landowners on the menu of voluntary measures and to streamline the reporting process.

Additional Forest Road Management Measures for Inventory and Reporting

Many private landowners have been implementing the Road Hazard Identification and Risk Reduction Project since 1997. Thousands of miles of roads have been inspected and repaired as part of this project (OWEB 2005). However, there is no consistent monitoring of road conditions after these repairs. Current information indicates that conditions of roads vary by land manager, by landscape, and by relative position of roads in watersheds.

Oregon has entered into a cooperative agreement with the USDA Forest Service to update its statewide forest road geographic information system data layer. The updated data layer is needed to redevelop a sample for a statewide survey of forest roads for the Board of Forestry's indicator D.c., Forest roads risks to soil and water resources.

The survey design uses a stratified random sample by landowner class and geographic area. The objective of the rapid road survey is to efficiently and effectively evaluate road risks to soil and water resources. The survey is designed to consistently evaluate current conditions and also near-term future road conditions likely to be affected by major storms. This survey can identify road elements that pose the greatest risk to soil and water resources by quantifying stream crossing condition, washout risk, and hydrologic connection to streams. Oregon hopes to start the survey in 2014, depending on cooperation with federal partners.

Oregon also requires a management plan for all family forestland owners in order to receive federal cost-share dollars administered by ODF. The plan requires a description of the roads and their characteristics that lie within the family forest based upon an onsite review of the roads. Roads should be identified as to their purpose, surface, length, drainage type, and number and type of stream crossings. Problem areas – poor drainage, rutting, clogged ditches and culverts, culvert failures, and road failures – are called out and

flagged for taking action. The standards in the uniform management plan have been developed and adopted by many cooperators, including the USDA Forest Service and Natural Resource Conservation Service, Forest Stewardship Council, and American Tree Farm System. Currently, plans are in place on 18% of 4.7 million acres.

ISSUE: Ensure the Adequacy of Stream Buffers for the Application of Certain Chemicals

Background

In 1994, the Board of Forestry (Board) extended the fish-use designation to many smaller streams that previously had not received the setback protection. In 1997, the board adopted revised pesticide rules, which extended spray setbacks along fish use streams to 300 feet for application of fungicides and nonbiological insecticides, based on the relative higher toxicity of these materials to animals as compared to the toxicity of herbicides. This change was a response to results of ODF monitoring conducted in 1992 and 1993, which indicated that the earlier, narrower setbacks for use of these materials might not have adequately protected water quality. With the assistance of Oregon State University and Portland State University, the Board determined that, with these and other measures included, public health and the environment would be adequately protected by the chemical rules.

The Board designed the Chemical and Other Petroleum Product Rules to mesh with regulations administered by other agencies. The total intended effect is that all of the regulations apply to a given forest pesticide application, and where there is any difference, the more stringent requirement applies.

- Federal Pesticide Registration Requirements: The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) ensures that adequate product testing is done, and that label requirements will minimize harm to humans and the environment. The forest practice rules include a requirement for forest pesticide users to comply with product labels.

- Oregon Pesticide Control Law: In Oregon, pesticide sellers and users must also comply with the state Pesticide Control Law (ORS 634), which requires state product registration and applicator licensing, and prohibits faulty, careless, or negligent applications.

- Pesticide Spills and Hazardous Material Disposal: DEQ typically takes primary jurisdiction on requirements for spill reporting, control, and clean up, but ODF has some authority through the forest practice rules if spills result from forest operations.

- Worker Protection Standards: The Oregon Occupational Safety and Health Division (OR-OSHA) administers regulations for protection of workers when pesticides are

being used.

The Board provided specific purpose statements in the Chemical Rules, as follows:

- Operators are encouraged to use integrated pest management practices.
- When properly used as part of an integrated pest and vegetation management system, pesticides and other chemicals can be effective tools in the growing and harvesting of forest tree species.
- The purposes of the rules are to ensure that chemicals do not occur in soil, air, or waters in quantities injurious to water quality or the overall maintenance of terrestrial or aquatic life; and vegetation in riparian management areas and sensitive resource sites is protected as required by other forest practice rules.

The Board also specifically required effectiveness monitoring and evaluation of the chemical rules to determine the effectiveness of the rules to meet the goals of the Forest Practices Act and the purposes stated in the rules, as well as their workability and operability (OAR 629-620-0700).

At the time of the issuance of the 1998 findings, effectiveness monitoring results had not been published. Under Section X, "Critical Coastal Areas, Additional Management Measures and Technical Assistance" the NOAA and EPA (1998) found that,

> Forest practice rules in effect at the time the Oregon 6217 program was submitted for approval did not require buffers for aerial application of herbicides or fertilizers for type N (non- fishbearing) streams. Such streams comprise significant portions of total stream length in the coastal zone. In January 1997, the ODF revised its rules governing application of chemicals. The new rules require a 60 foot buffer on type N streams for direct aerial application of fungicides and nonbiological insecticides except as approved by the State forester. *The rules do not contain restrictions for aerial application of herbicides, which would appear to leave type N streams still at risk* (emphasis added).

Forestry Management Measures for Chemicals

The FPA affords waters protection through the Chemical and Other Petroleum Rules (OAR 629-620-0000 through 0800). There are five sets of BMP's that define protection measures waters of the state. The rules include standards and BMPs for mixing, transport, equipment leak prevention, disposal, and completion of daily spray records. The rules also provide for

protection of the waters of the state and other resources when applying chemicals (OAR 629-620-0400). The rules require that:

- When applying chemicals aerially or from the ground, operators shall protect waters of the state and other forest resources by following the requirements of the chemical product label and by meeting the additional protection measures listed in this rule.
- When applying herbicides near or within riparian management areas or waters of the state, operators shall maintain vegetation required to be protected by the water protection rules.
- Weather conditions such as temperature, relative humidity, wind speed, wind direction, atmospheric temperature inversions, and precipitation may strongly affect the deposition and drift of chemicals during aerial and pressurized, ground-based chemical applications. Operators shall apply chemicals only under weather conditions which will protect non-target forest resources and comply with the product label and the other sections of this rule.

In addition to the above management measures, forestry operators must not directly apply chemicals within specified distances of certain waters. The setbacks are outlined as follows:

- For herbicides and most other pesticides, no direct application is allowed within 60 feet (for aerial applications) or 10 feet (for ground-based applications) of streams with fish use or domestic use, lakes or wetlands greater than eight acres, estuaries, bogs, lakes with fish use, or areas of standing water exceeding ¼ acre.
- For fungicides or nonbiological insecticides, no direct application is allowed within 300 feet (for aerial applications) or 10 feet (for ground-based applications) of streams with fish use or domestic use, lakes or wetlands greater than eight acres, estuaries, bogs, lakes with fish use, or areas of standing water exceeding ¼ acre. Aerial application of these pesticides is also prohibited within 60 feet of any other streams with flowing water at the time of application.

Except for additional protections for fungicides or nonbiological insecticides, Oregon relies on BMPs set by the ODA and EPA (under FIFRA) for protection of small non-fish bearing streams during pesticide applications. In setting forest practice chemical rules, the Board of Forestry determined that forestry chemical rules should not be product-specific. Regulation of specific chemicals is best accomplished through clearly written, legally

binding product labeling enforcement by ODA and EPA.

Monitoring for Effectiveness of Pesticide Management Measures

Per Board direction, ODF conducted effectiveness of riparian buffers for protecting fish bearing streams (Dent and Robben 2000). At the time of the study, there were no regulatory aquatic benchmarks set for the forestry pesticides analyzed in the study. With assistance from scientists from Oregon State and Portland State Universities, ODF staff established "thresholds of concern" against which monitoring results were compared. Monitoring results determined that "No pesticide contamination levels at or above 1 ppb were found in any of the post-spray samples analyzed". By comparison, the study thresholds of concern ranged from 7 – 52,000 ppb. Seven of 25 post-spray samples (2 of 5 sites) were tested at levels lower than 1 ppb (mdl 0.5 to 0.04 ppb) contained trace levels of pesticides. Contamination levels ranged from 0.1 to 0.9 ppb. The contaminants included hexazinone at one site and 2, 4-D ester from one site. The study concluded that the rules are effective at protecting water quality on Type F and D streams. If the current scientific knowledge of hazard levels for human and aquatic biota does not change, no changes are recommended to the forest practice rules.

This study was not able to address the question impacts to water quality that might occur as a result of other mechanisms besides drift or direct applications (e.g., runoff, seepage, and leaching). The study also did not address water quality protection of streams that do not have an overstory riparian buffer (small Type N streams).

The WRC, Alsea Paired Watershed Study in central coastal Oregon included monitoring to address delayed impacts to water quality and impacts from streams that do not have an overstory riparian buffer (NCASI 2013). This study measured concentrations of dissolved glyphosate, aminomethylphosphonic acid (AMPA), imazapyr, sulfometuron methyl, and metsulfuron methyl in streamwater collected during and after application of herbicides to a harvested commercial forestry site in the Oregon Coast Range. Samples were collected at three sites, one representing a small non-fish bearing stream (Type N) with no overstory vegetation retention requirements (NBH). . The other two sampling sites were downstream; one (NBU) at the bottom of the harvest unit and the other (NBL) well downstream. Samples were collected during the application, multiple days after treatment, and during storm events. No detections were found for any herbicide except glyphosate. Minimum detection levels ranged from .015 to 1 μg/L. The study did detect dissolved glyphosate at NBH during the application (baseflow conditions). This pulse maximized at 40 to 60 ng/L and persisted for two to three hours. An associated pulse was not detected (<20 ng/L) at the farthest downstream sampling site (NBL). Subsequent baseflow samples collected three days after treatment showed ≈25 ng/L dissolved glyphosate at all three sites and less than 20 ng/L at 19 days after treatment. Samples

collected during the first storm event (8 days after treatment) detected dissolved glyphosate at NBU, but not at NBH or NBL. The maximum concentration observed during this pulse at NBU was 115 ng/L, and the pulse persisted for about six hours. During the next storm event (10 days after treatment) dissolved glyphosate was detected at NBH, but not at NBU or NBL. The maximum concentration observed was 42 ng/L, and this pulse persisted for about ten hours. Results from all subsequent storm events showed dissolved glyphosate at <20 ng/L in all samples. A limited number of analyses on suspended sediment showed *de minimis* masses of glyphosate and AMPA.

The Alsea study results are supported by reconnaissance monitoring of land-use sources of pesticides in the McKenzie River Basin conducted the US Geological Service (USGS) in cooperation with the Eugene Water and Electric Board (EWEB). Kelly and others (2012) conducted the study from 2002 through 2010 to investigate different land use activities in the watershed for potential sources of pesticides. The analysis included more than 175 compounds, of which 43 were detected at least once across the range of 28 sites upstream of EWEB's Hayden Bridge Water Filtration facility. The study focused on three land use categories – urban, forestry and agricultural. A total of nine pesticides were detected out of 14 samples from the intake of the utility's drinking-water treatment plant from 2002 through 2010, seven of them only once, and two of them twice. Concentrations were quite low, less than one part per billion, indicating that the potential threat from these compounds to human health was negligible. The largest number of pesticide detections occurred during spring storm events and primarily were associated with urban stormwater drains in Springfield that feed into the lower McKenzie. In contrast to urban runoff, compounds associated with commercial forestry pesticide use were rarely detectable in the McKenzie River, even though forest land accounts for the majority of property in the basin (Kelly et al. 2012).

Additional Monitoring and Management Measures

In addition to regulations described above, DEQ and ODF have additional programs that address pesticide use. These programs include the formation of the Water Quality Pesticide Management Team in 2007 by DEQ, ODF, the Department of Agriculture and the Oregon Health Authority. One of the team's primary tasks was to develop and implement an inter-agency Water Quality Pesticide Management Plan (WQPMP)[5] to guide statewide and watershed-level actions intended to protect surface and groundwater from the potential impacts of current use pesticides. Although the plan was not developed in direct response to Coastal Zone Act Reauthorization Amendments or Biological Opinions, it addresses protecting water quality and beneficial uses, including threatened and endangered species, from pesticide use.

EPA approved the WQPMP in 2011. The plan focuses on the use of water monitoring data,

[5] Available at http://www.oregon.gov/ODA/PEST/docs/pdf/wqpmtpmp.pdf (last accessed June 13, 2013).

primarily through local Pesticide Stewardship Partnerships (PSPs), as the driver for management actions. A continuum of management responses is outlined in the plan based on the monitoring data, with an emphasis on collaborative solutions in the short-run to address areas of concern highlighted by the data. Current monitoring on forestland under the PSP program has been limited to one watershed where there are monitoring locations directly downstream of managed forest lands. The data collected in this watershed indicate that pesticides in water adjacent to forestland are a low priority concern based on the multi- agency approved matrix in the WQPMP. Pesticide concentrations observed on forestland are well below any of the lowest benchmarks provided by EPA. Regulatory actions are to be used with existing agency authorities under federal law, such as Fungicide, Insecticide and Rodenticide Act and the Clean Water Act, or state law, if the water quality concerns are not resolved through collaborative efforts.

Sufficiency of Forest Chemical Management Measures

While there is a lack of aquatic benchmarks for most forestry pesticides, recent studies and collaborative monitoring efforts indicate that current forestry measures are effective at ensuring that chemicals do not occur in waters in quantities injurious to water quality or the overall maintenance of terrestrial or aquatic life. Current studies indicate that concentrations from forestry applications occur at levels below 1 μg/L (1 ppb) which are much lower than currently available thresholds of concern for aquatic life (e.g., NMFS 2011 Biological Opinion set value of 100 μg/L for the maximum concentration limit on 2,4-D).

ISSUE: Back-up Enforcement Authority for Forestry Measures

Under ORS 468B.110(2), ORS 527.765, and ORS 527.770, the Board of Forestry establishes BMPs or other control measures by rule that, to the maximum extent practicable, will ensure attainment and maintenance of water quality standards. If the Environmental Quality Commission (EQC) does not believe that the FPA rules will accomplish this result, the EQC is authorized to petition the Board for more protective rules. If the EQC petitions the Board for review of BMPs, the Board has two options: terminate review with the EQC concurrence, or begin rulemaking. If the Board determines that BMPs should be reviewed, rules specifying the revised best management practices must be adopted not later than two years from the filing date of the petition for review, unless the Board, with concurrence of the [EQC], finds that special circumstances require additional time. Upon EQC's request, the Board is required to take interim action "to prevent significant damage to beneficial uses" while the BMPs are being reviewed. In addition, the "BMP shield" in ORS 527.770 is lost if the Board fails to complete BMP revisions, or makes a finding that revisions are not required, within the statutory deadline. (The BMP shield prevents DEQ from taking enforcement action against operators for failure to comply with water quality standards if the operator is complying with the FPA.)

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