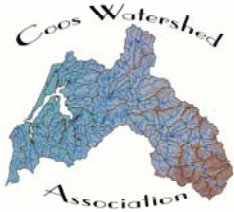


Coos Watershed Association

Model Watershed Program



Approved by the Board of Directors
April 9, 2008



The **Coos Watershed Association** (CoosWA), founded in 1994, is a 501(c)(3) non-profit organization whose mission is “to provide a framework to coordinate and implement proven management practices, and test promising new management practices, designed to support environmental integrity and economic stability for communities of the Coos watershed.” The Association works through a unanimous consensus process to support the goals of the Oregon Plan for the Restoration of Salmon and Watersheds. Our 20 member Board of Directors includes representatives from agricultural, small woodland, waterfront industries, fisheries and aquaculture, local government, environmental, industrial timberland and state and Federal land managers.

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1. INTRODUCTION TO THE COOS WATERSHED ASSOCIATION

Early History. The Coos Watershed Association (CoosWA) was incorporated in 1994 after discussions among land managers began in the fall of 1993. Land managers were concerned that coho salmon would be listed under the Endangered Species Act, leading to the type of impacts they had seen with the listing of the northern spotted owl. The idea behind forming the Association was that land managers in the watershed could create a conservation plan for coho that would preclude the need for their listing in the Coos basin. The parties involved in these discussions—Mike Graybill, manager of the South Slough National Estuarine Research Reserve; Bob Laport, Coos County Forester; Jim Clarke, Weyerhaeuser Timber Company; Tom Hoesly, Menasha Forest Products; Allan Rumbaugh, Director of the Oregon International Port of Coos Bay; Joan Mahaffey, Dan Brelage and John Brands, agriculture; Ken Messerle and Robert Mahaffey, small woodlands; Timm Slater, North Bend mayor; Mel Chase, BLM; and Clark Seeley, Oregon Department of Forestry—became the first members of the Executive Council (as the Board of Directors was named at that time). Two years of discussions ensued as the Coos Watershed Association evolved into a non-profit organization, with IRS 501(c)(3) status being received in August, 1996.

Mission

The mission of the Coos Watershed Association is to provide a framework to coordinate and implement proven management practices, and test promising new management practices, designed to support environmental integrity and economic stability for communities of the Coos Watershed.

As the Executive Council was discussing the larger issues of coho salmon conservation, their first Executive Director, Anne Donnelly, was identifying opportunities to create watershed restoration projects. The CoosWA applied for, and received, grants under the state's Watershed Health Program beginning in July, 1994 (SC-09) to initiate its watershed restoration program. These initial restoration grants went for a plethora of different types of activities: fish passage improvements at culverts, large wood placement, and riparian restoration through planting and installation of willow walls, as well as creating off-channel rearing ponds. Two larger policy events happened during this period made additional funding available: the U.S. Forest Service and Bureau of Land Management approved the Northwest Forest Plan (NWFP) in 1994 that resulted in substantial reductions in timber harvest from Federal lands. As a part of the NWFP, the Federal government instituted the Northwest Economic Adjustment Initiative (NEAI) that provided funds to utilize displaced woods workers for watershed restoration projects. At the same time, restrictions on the commercial fishing for coho (and other) salmon lead to a "Hire-the-Fisherman" (HTF) program administered by the Natural Resources Conservation Service (NRCS) using Federal funds. As with the NEAI, the HTF program was oriented towards employing displaced workers for labor-intensive watershed restoration projects. The CoosWA used these funds to conduct road-and-landing surveys, aquatic habitat inventories, and spawning surveys in addition to other on-the-ground restoration activities.

A second series of natural effects combined with an election provided the catalyst for the CoosWA to further expand its restoration program. In the winter of 1996 – 1997 a series of high intensity rain storms hit the Oregon coast. The after effects of these storms provided a vivid demonstration to land managers that much of the previous infrastructure in the watershed was insufficient to withstand storm flows, including a high number of landslides, road fill failures, and culvert washouts in the Elliott State Forest. The storm created an immediate increase in the

demand for watershed restoration actions, particularly those involving forest roads (e.g., culvert replacements and road “storm proofing”). The CoosWA used existing grant funds to begin restoration projects at some sites, but other locations had to wait for additional funding. As the watershed was digging out from these events, an initiative petition referred Measure 66 to the voters in November, 1998 that required 7.5% of the net proceeds of the Oregon Lottery go towards watershed restoration, of which 65% of these funds had to be spent for capital (on-the-ground) restoration projects.

These early Watershed Health grants and employment programs provided the bulk of CoosWA’s program effect until the late 1990’s. With the increased availability of Lottery funds, the Association’s restoration program continued to expand in its traditional areas of fish passage, road improvements, and instream complexity. In 2000, the Association successfully prepared a \$1.2 million Coastal Wetlands Program grant with the U.S. Fish & Wildlife Service and the Oregon Watershed Enhancement Board (OWEB). With this large grant, Anne Donnelly requested the CoosWA Executive Council to sub-contract with the South Coast Land Conservancy (SCLC) to administer the grant and she resigned as Executive Director to go to work for the SCLC. Jon Souder was hired by the Executive Council in June, 2000 as the new Executive Director. With the new Executive Director, the CoosWA’s programs evolved to meet the Executive Council’s desire for a more scientifically-oriented organization. In addition, the large number and amounts of grants administered by CoosWA necessitated changes to effectively manage the organization.

Organizational Development. During its initial two years, the Executive Council developed a *Statement of Shared Values* that represented their commitment to working together to attain the mission of the Coos Watershed Association (see side box at right). From its earliest days, the CoosWA Executive Council has always worked using a consensus process where a decision is not made until there are no further objections to it. This process has served the CoosWA well in that it requires Council members to actively listen to their colleagues and anticipate their concerns. This consensus process worked well until the CoosWA stumbled in its implementation of the Coastal Wetlands grant. The Executive Council decision to purchase at sheriff’s auction a defunct dairy was—it is now generally acknowledged—made in haste without an adequate determination of potential political liabilities. Fallout from this action in 2000 caused considerable turmoil in the Executive Council which was remedied only after a facilitated retreat in 2002 that created a *Vision and Goals* plan renewing the original shared values.

Statement of Shared Values

- *It is possible to achieve both environmental integrity and economic stability within the Coos watershed;*
- *Natural products and processes of the watershed are indicators of watershed health, and are important to the economy and vitality of the community;*
- *Human activities have a legitimate place in the watershed;*
- *Our actions can affect the stability of the watershed and related economy;*
- *Deliberate planning and action for watershed health are important and effectively achieved by the people who live and work within the watershed;*
- *A watershed-scale perspective improves our ability to sustain the health of the watershed and related economic activities; and*
- *The coordination of our individual efforts can achieve a synergistic, beneficial effect on the watershed.*

Once calm was restored, the Executive Council was prepared to strengthen the organization. In 2004, the CoosWA was approached by Shorebank (Enterprise) Pacific to partner with them to

develop a strategic plan for the Association. Shorebank would use this as a pilot project to develop their capacity to work with watershed councils, and the CoosWA would accomplish one of its organizational development goals. As part of the strategic planning process, Shorebank conducted an Internal Audit of CoosWA's operations in June, 2004 that identified a series of recommended procedural improvements. The Executive Council created a Strategic Planning Committee to act on these recommendations. In September, 2004 the draft *Strategic Framework 2005 – 2015* was presented to the Executive Council. This draft was re-worked by the Strategic Planning Committee and approved by the Executive Council in November, 2004. At this time the Executive Council established the Strategic Plan Implementation Committee to take an active role in addressing the organizational needs in the *Strategic Framework*. The Bylaws, committee structures and duties, and staffing plans were substantially revised during 2005 as a result of the Strategic Plan Implementation Committee's work.

State budget crises during the 2003 – 2005 and 2005 – 2007 bienniums resulted in limited OWEB Council Support grant funding. In light of this problem, the Board of Directors (renamed from Executive Council in the Bylaw Amendments of February, 2005), decided to focus on the Strategic Plan Implementation Committee's efforts on building a sustainable funding basis for CoosWA. The *Strategic Framework* identified diversifying funding by developing "fee for service" contracts, obtaining foundation support, and increasing local community support for the Association. Using an Effective Organizations grant through the Ford Institute For Community Building of the Ford Family Foundation, the CoosWA hired two consultants in November, 2007 to assist it with the preparation of a *Fund Development Plan* as part of implementing the *Strategic Framework*. Working with the Board of Directors, the consultants presented a draft *Resource Development Plan* in August, 2007. The Board is presently working through this draft to finalize the Plan and begin its implementation. As part of implementation, the Board revised their Statement of Expectations to explicitly include a requirement for Board members to involve themselves in fundraising for the organization, and established a "Friends of the Coos Watershed" group to provide opportunities for local people to become involved with the CoosWA. A "Friends" membership drive and Annual Campaign for donations are scheduled for November and December, 2007.

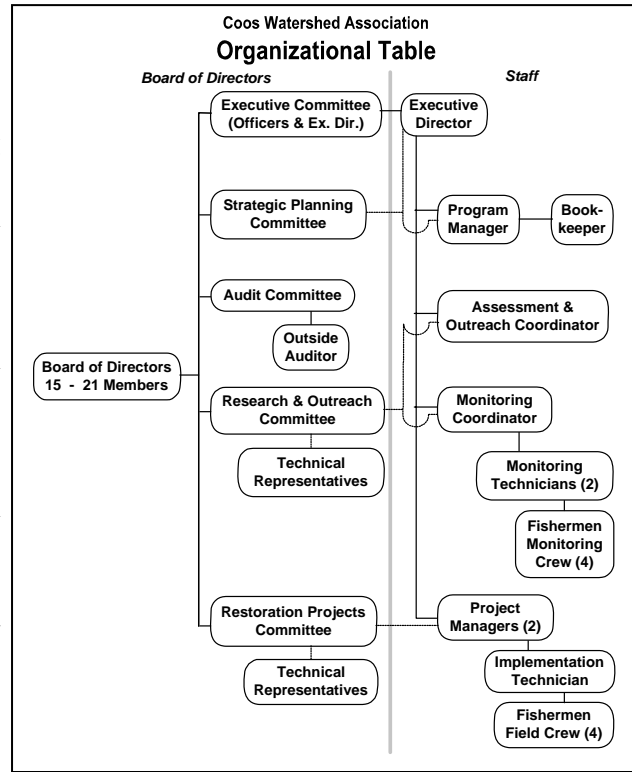
Organizational Structure. The Coos Watershed Association is governed by a 16 – 21 member Board of Directors representing a diverse group of stakeholders. While our Bylaw revisions in 2005 allowed for a range in membership, and removed any explicit requirement for identified stakeholder categories, the culture of diverse representation continues. By our Articles of Incorporation, the Association's Board is self-elected, with outgoing Directors having the prerogative to nominate their successor. There are ten stakeholder categories for Board members:

- Industrial Timber (2)
- Small Woodlands (2)
- Agriculture and Ranching (2)
- County and Local Government (2)
- State Land Managers (2)
- Federal Land Managers (1)
- Waterfront Industries (1)
- Fisheries & Aquaculture (1)
- Tribes (1)
- Public-at-Large (inc. Environmental) (4)

The numbers in parentheses after the stakeholder category represent the present makeup of the Board of Directors.

The 2005 Bylaw amendments formally established the committee structure shown in the box at right. All standing committees are expected to have Annual Workplans. Voting members of the Committees consist of the Board members; the Education and Outreach and Restoration Projects Committees have external technical advisory members.

Staff employed by the CoosWA consists of an Executive Director who is responsible to the Board of Directors for implementing their policies. The Executive Director, Dr. Jon A. Souder, has over 30 years of experience in natural resources management, including 10 years as a fisheries biologist with the Federal government; 10 years as a policy analyst (and author) evaluating state trust lands management; 7 years as a faculty member in the College of Forestry at Northern Arizona University; and 7 years as Executive Director for the Association.



Dr. Souder's bachelor's degree was in limnology from Marlboro College, his M.S. in Wildland Resource Science emphasizing forest management and economics, and Ph.D. in Wildland Resource Science emphasizing law, policy and economics were from the University of California, Berkeley.

Depending upon personnel turnover and grant funding, the Association employs a Program Manager who is responsible for grants management and day-to-day operations; two project managers who implement the restoration program, and a monitoring coordinator. These professional positions are filled with people who have either a Masters degree, or a Bachelor's degree with significant experience. The Internal Audit identified staff turnover as a significant impediment to sustaining the organization's effectiveness; the Board is committed to raising salaries and providing benefits as identified in the *Strategic Framework* to lower turnover rates. The CoosWA benefits from a coterie of three experienced monitoring technicians (including one having 11 years employment with the Association) who are responsible for conducting aquatic habitat inventories, riparian and shade analyses, spawning surveys, road and landing surveys, and operation of the stream gaging station network. As these technicians gained experience they have increasingly provided higher-level technical support for the assessment and monitoring program, as well as assisted in the development of restoration grant proposals. The Association also benefits from a very talented office manager/bookkeeper who handles the CoosWA's accounting and general office management tasks.

Need For the Model Watershed Program. From our first experiences with effectiveness monitoring in 2001, it became apparent that we needed greater scientific rigor in our approaches

if we were going to be successful in identifying responses of fish and habitat to our restoration actions. As long as four years ago, we identified the potential to use the U.S.E.P.A.'s EMAP-based sample frame as one means to measure the "signal" from the restoration actions and filter out the "noise" of natural variations. The attractiveness of this strategy is based on the long time series of EMAP-based status and trend monitoring of spawning populations, aquatic habitat, salmonid juveniles, and water quality indices conducted by the Oregon Department of Fish and Wildlife (ODFW) and the Oregon Department of Environmental Quality (DEQ). This existing dataset is known to be precise for estimates at the HUC 4th Field scale. Our desire is to link our monitoring program with the EMAP-based sample strategy so that we can evaluate changes in fish populations, aquatic habitat, and water quality at larger spatial scales, i.e., from the HUC 5th Field to as detailed as the HUC 7th Field. However, up to this point, we have not had the organizational capacity to attain this goal.

We see three principle benefits from participating in the Bonneville Environmental Foundations Model Watershed Program (MWP):

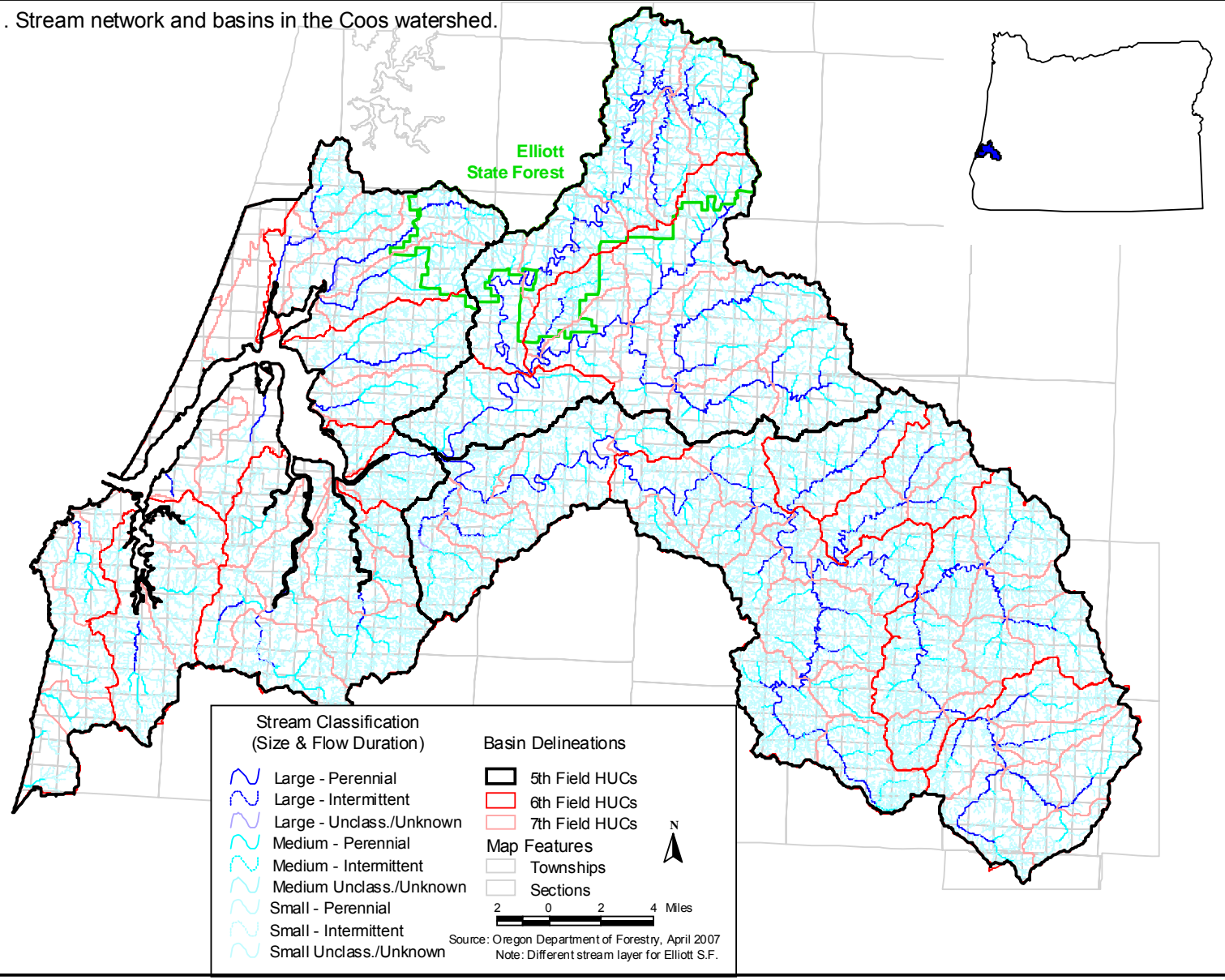
1. Participating in the MWP will focus intellectual resources that we need to attain higher levels of scientific rigor in our restoration, assessment, and monitoring programs.
2. Participating in the MWP will require us to plan long-term for our program evaluations, and to think strategically about where to invest our efforts in restoration, assessments, and monitoring; and
3. Participating in the MWP will build organizational capacity to carry out the tasks identified in our Workplan, draw significant external funding, and provide the stability and certainty needed to lure and retain highly qualified staff.

Furthermore, CoosWA seeks to move beyond project-scale effectiveness monitoring to measurements of changes in natural functions and ecosystem health. Many of the goals of climate change adaptation are to increase the resilience of river ecosystems in the face of drastic changes. These concepts of health, integrity, and resilience are often extremely vague and difficult to quantify. However, a grant from BEF to develop this proposal has enabled CoosWA to explore these concepts further and identify promising protocols and statistical techniques.

2. PROPOSED MODEL WATERSHEDS DESCRIPTION

Description of the Coos Watershed. The Coos Watershed is one of the most diverse watersheds on the Oregon Coast, covering approximately 390,000 acres, or 610 square miles, of estuary, uplands, and urban areas (see Map 1). It is nestled in the coastal temperate rainforest, one of the most productive biological landscapes on the planet. The Coos watershed is unique on the Oregon coast for its high proportion (greater than 75%) of private land. Three Hydrologic Unit Codes (HUC) fifth field watersheds drain into the Coos Bay estuary: the Millicoma River, South Fork Coos River, and Coos Bay Lowland tributaries. The Coos Bay estuary is the largest on the Oregon Coast (with the exception of the Columbia River), is one of the most productive and important habitats for coastal coho salmon on the Oregon coast, and has a broad range of land uses and ownership. The combined cities of Coos Bay and North Bend have a population of 25,000 (the largest urban population center on the Oregon coast), with approximately another 5,000 people living outside the cities in both unincorporated towns and rural areas.

MAP 1. Stream network and basins in the Coos watershed.



The Coos watershed is in the Mid-South Coast gene conservation area (GCA) for Oregon coast coho salmon. According to ODFW surveys, this GCA is the strongest on the coast (23% -39% of the total coastal coho population), with the Coos River providing anywhere from half to three-quarters of the wild coho salmon in the GCA. Based on an assessment of juvenile coho, 29% of pools in the Mid-South Coast GCA met full seeding levels (≥ 0.7 fish/m²), statistically significantly higher than other GCAs on the coast. Of the eight sites snorkeled in the Coos watershed in 2000, only 2 (25%) were considered fully seeded with juvenile coho. While this statistic shows the value of the Coos watershed for salmon restoration, it indicates how far we have yet to go before we successfully achieve our goals.

One of the unique features of the Coos watershed, and one of the major challenges in our efforts, is that the Coos watershed has the highest percentage of private lands on the Oregon coast of any watershed of its size. Taken as a whole, private lands comprise 81% of the watershed, with Federal lands being only 11%, state lands 9%. Table 1 shows the breakdown by HUC 5th fields.

Table 1. Land ownership in the Coos watershed.

5 th Field HUC	Name	Acreage	Private	State	Federal
1710030404	Coos Bay	132,060	88.1%	4.9%	7.0%
1710030403	Millicoma R.	96,685	70.0%	30.0%	0.0%
1710030401	S.F. Coos R.	160,445	79.6%	0.05%	20.3%
Totals		389,190	80.7%	8.8%	10.5%

In addition to high percentages of private lands, the Coos watershed also has significant amounts of urban and rural residential lands in critical lowland areas, including the largest urban area on the Oregon coast (Coos Bay 5th field). Table 2 shows the land use categories by HUC 5th fields.

Table 2. Land uses in the Coos watershed.

5th Field	Agriculture	Forestry	Rural Residential	Coastal	Urban, Industrial & Rural Centers	Parks
Coos Bay	6.2%	66.1%	7.2%	7.0%	8.5%	5.1%
Millicoma R.	0.2%	98.1%	0.3%	1.2%	0.03%	0.2%
S.F. Coos R.	0.4%	98.8%	0.2%	0.7%	0.0%	0.0%
Totals	2.3%	87.5%	2.6%	3.0%	2.9%	1.8%

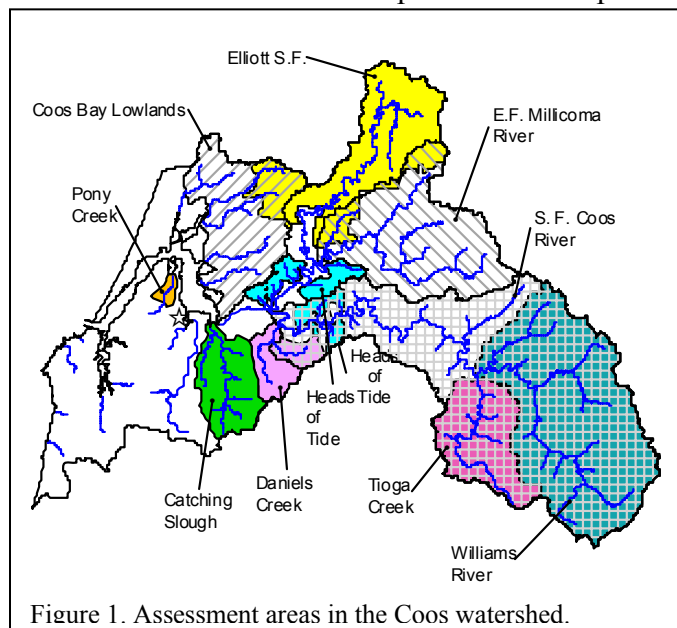
The Role of Science. The CoosWA prioritizes science and community support as the foundation of our watershed restoration program. We have completed limiting factors analyses, assessments, and action plans to guide our work. We have sought peer review, creatively funded an extensive monitoring and assessment program, and are committed to an accountable, watershed-scale restoration approach. We work with educational institutions and agencies to develop “best available science” tools for our key watershed restoration programs. This involves obtaining or preparing scientific literature syntheses, identifying and utilizing standardized survey protocols, and developing QA/QC plans for monitoring.

In 2000, the CoosWA identified four areas where additional science and tools were needed to effectively implement and evaluate watershed restoration programs. These areas were: (1) silviculture techniques to improve the success of our riparian restoration projects; (2) the effects of tide gates on formerly estuarine wetlands and sloughs; (3) sources of bacterial contamination adversely affecting oyster cultivation in Coos Bay; and (4) how to evaluate estuarine wetland conditions and trends. Through partnerships with other watershed councils, Oregon State

University Sea Grant, local schools, consultants, and state and federal agencies, we have successfully addressed all four areas. With other south coast watershed councils, and with funding provided by OWEB, we worked with a consultant to publish the *Coastal Oregon Riparian Silviculture Guide* in December, 2003. This *Guide* included monitoring protocols that we've incorporated into our riparian restoration program. Partnering with Dr. Guillermo Giannico at Oregon Sea Grant we published a general brochure, *The Effects of Tide Gates on Estuarine Habitats and Migratory Fish* (2004) and the first-ever literature synthesis, *Tide Gates in the Pacific Northwest: Operation, Types, and Environmental Effects* (2005). Through a DEQ §319 grant, we worked with the South Slough National Estuarine Research Reserve, Marshfield (Coos Bay) High School, and the University of Washington to conduct a microbial source tracking study in three characteristic land uses (urban, rural residential, and natural) surrounding Coos Bay. This was the first successful study in Oregon that used DNA markers to identify the sources of bacterial contamination. Finally, with funding from the U.S. Environmental Protection Agency, we worked with the Oregon Department of State Lands and Dr. Paul Adamus, a renowned wetland scientist, to create the *Hydrogeomorphic (HGM) Assessment Guidebook for Tidal Wetlands of the Oregon Coast* (2006).

Watershed Assessments. In conjunction with our tool development and effectiveness monitoring, the CoosWA embarked on a rigorous watershed assessment program in 2001 using an OWEB grant (see Figure 1). Our program is intended to complete watershed assessments for those areas of the Coos basin that do not have completed plans. At initiation, the only areas in the Coos basin with watershed assessments were the East Fork Millicoma River (Weyerhaeuser); the South Fork Coos River (BLM and Weyerhaeuser); Tioga Creek (BLM), and the Williams River (Weyerhaeuser) (see Figure 1). Since 2001, the CoosWA has worked with partners to complete a watershed analysis for the Elliott State Forest (Oregon Department of Forestry); Lower Pony Creek (Lower Pony Creek Watershed Committee), and the Coos Bay Lowlands. Draft watershed assessments have been completed for the Heads-of-Tide area of the Millicoma and S. Fork Coos River; Catching Slough; and Daniels Creek. These latter three assessments will be completed during 2008 using DEQ §319 funding. We are applying for funding to complete the Isthmus Slough watershed (just to the east of Catching Slough).

Information in the watershed assessments is used to develop restoration action plans using a process we developed as part of a National Sea Grant Pilot Project in conjunction with Oregon Sea Grant. For the restoration action plans, each sub-basin (equivalent to a 7th field HUC) is divided into 2 to 4 sub-areas representing geomorphic forms (i.e., tidal, lower valley, mid-valley, upper forested). This process also includes hosting a series of three “coffee klatches” with residents in each of the assessment areas. The first meeting introduces the CoosWA and asks residents for their views for the future of the sub-basin and elicits their



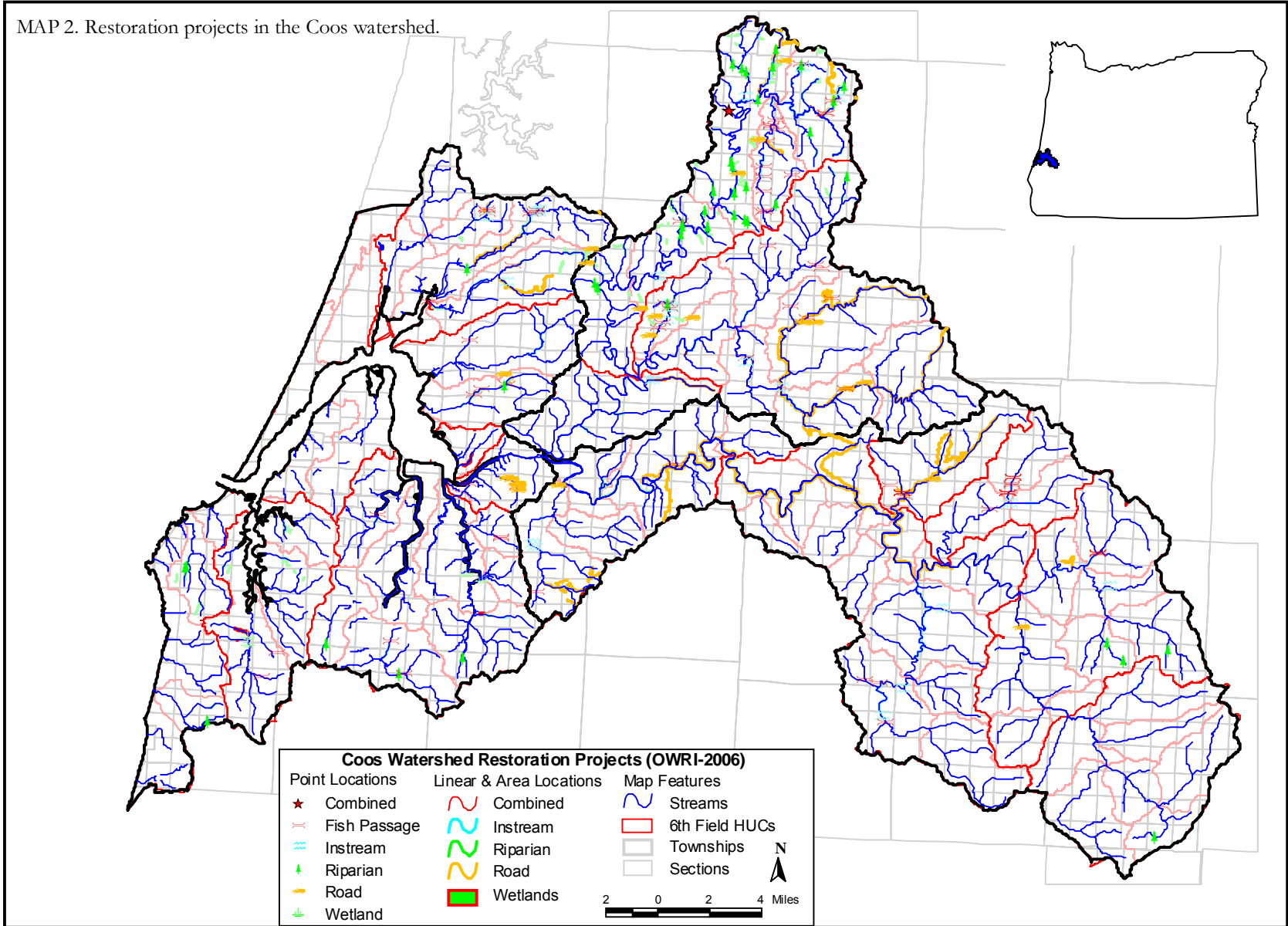
management concerns. The second meeting describes various restoration actions and includes a field trip to view existing projects. The third meeting presents the results of our assessment and asks residents for their scoring for the acceptability of various types of potential restoration actions for each of the sub-areas in the sub-basin. The results from the residents input are used to verify CoosWA scoring of the social and political acceptability of various types of restoration actions. These scores are then incorporated into a larger prioritization scheme that will be described in greater detail in the next section of this proposal.

Restoration Program Priorities. Since its inception in 1994, the Coos Watershed Association has implemented about 300 on-the-ground projects designed to improve salmon habitat and water quality. These projects range from fish passage improvements (culvert and tide gate replacements), sediment reduction (ditch-relief culverts, road upgrades, and bio-engineered stream bank protection), aquatic habitat improvement (large wood and boulder placements), and riparian improvements (planting and fencing). Map 2 shows the locations and types of these projects. Early projects focused on fixing fish passage barriers and riparian restoration on a mostly opportunistic basis. Once road and landing surveys were conducted as part of the Hire-the-Fisherman program, fish passage upgrades became more systematic. The 1996 floods added to restoration opportunities due to the large number of culvert and fill failures. Riparian restoration projects also benefited from the availability of work crews.

However, passage of S.B. 1010 in 1993 required Agricultural Water Quality Management Plans (AWQMP) be developed by a local advisory group (LAC) of stakeholders under the auspices of the Oregon Department of Agriculture. The LAC for the Coos-Coquille AWQMP was convened in 1998 and completed their plan in February, 2002. This process was very polarizing for the agricultural community in the watershed, and because of this the CoosWA essentially withdrew from restoration activities in lowland areas during this period. Our strategy began to change in 2001 when the CoosWA became engaged with a local drainage district working to install an improved tide gate on Larson Creek. At about the same time, the CoosWA responded to a request from a local rancher, Jim Jaberg, to provide assistance in implementing a Conservation Reserve Enhancement (CREP) project on his property. Paralleling these events, our watershed assessments in the Coos Bay Lowlands were highlighting the values of these habitats for coho salmon. In combination with the tools that we were developing—the *Riparian Silviculture Guide* and our work on tide gates—provided the stimulus we needed to move back into the lowlands. The completion of the Coos draft Bay Lowlands Watershed Assessment in 2005 provided the impetus to rebuild our restoration program in the lowlands.

During this same period (2002 – 2006), we developed and applied a restoration prioritization process to identify limiting factors for salmon restoration and water quality improvement. The Restoration Projects Committee identified a set of spatially-explicit strategies to sustain and restore conditions in the Coos watershed as part of their 2006 and 2007 Workplans (see detailed discussion in the next section). These strategies compliment our present practice of identifying the entire suite of restoration projects needed in a HUC 7th Field sub-basin and implementing those in a coordinated fashion. This targeted strategy is a change from our previous “opportunistic” restoration approach.

MAP 2. Restoration projects in the Coos watershed.



Effectiveness Monitoring. Beginning in 2000, CoosWA intensified its science-based management by initiating a project effectiveness evaluation of its fish passage and instream complexity restoration program using an OWEB integrated monitoring grant. Copies of our effectiveness monitoring reports can be found on our website, www.cooswatershed.org. In 2001, we published our first evaluation, *Effectiveness Monitoring of Large Wood, Boulder Weirs, and Culvert Replacement Projects in Selected Streams of the Coos Watershed*. Funding for project effectiveness monitoring was subsequently built into most of our grant applications, which allowed us to begin supporting full-time monitoring technicians. Since that time, we have focused on intensive monitoring of our riparian plantings, which has involved developing a Microsoft Access database template to manage and analyze the monitoring results. Developing this tool—and evaluating 5 years of planting and monitoring results—has led to preparing a second addition of the *Coastal Oregon Riparian Silviculture Guide*, as well as the *Riparian Restoration Planting and Establishment: Program Effectiveness Monitoring Report* (draft, 2005). A second focus area for our effectiveness monitoring is our sediment reduction program focusing on storm proofing forest roads. Our initial efforts resulted in a second draft report in 2005, *Road Drainage Improvement For Sediment Reduction: Program Effectiveness Monitoring Report*. This effort was expanded to include a three-year Before-After-Control-Impact (BACI) study that combines effectiveness and validation monitoring to test models of road sediment generation. This study, in partnership with the Weyerhaeuser Timber Company, will be completed in 2008.

Description of the Case Study Areas. We propose to approach the question of whether the watershed restoration efforts of the Coos Watershed Association are successful using a tiered strategy to evaluate different spatial scales. The smallest spatial scale involves evaluating status and trends of indices at the entire watershed level, i.e., the three HUC 5th fields. The characteristics of this area—as far as fish presence—are displayed in Map 1 and were discussed previously. Analyses of status and trends at this scale will allow us to evaluate general conditions in the watershed. However, for the purposes of evaluating the program effectiveness of the Coos Watershed Association's actions, we propose to focus on four larger scale HUC 6th field watersheds because they have been the site for concentrated restoration actions over the past 15 years. These four areas are shown in Figure 2, and include the Coos Bay Lowlands, the Heads-of-Tide region at the confluence of the Millicoma and South Fork Coos Rivers, the upper West Fork Millicoma River, and Bottom Creek:

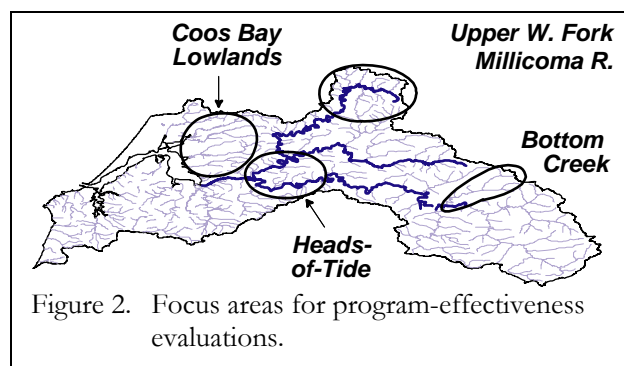


Figure 2. Focus areas for program-effectiveness evaluations.

Coos Bay Lowlands. The Coos Bay Lowlands is an area of low gradient streams with tide gates at their mouths. These sub-basins have lower valleys in agricultural use, often with rural residential lots interspersed on the valley floor and on hillsides. Ridges and slopes in the upper valleys are used for forestry, and the Elliott State Forest extends into the upper Palouse and Larson sub-basins. Even under intense land use pressures, the streams in the Coos Bay Lowlands are some of the most productive for coho salmon on the Oregon coast. The first intensive watershed assessments conducted by CoosWA as part of a National Sea Grant Pilot Project covered these basins,

and the resulting datasets are considered by Dr. Guillermo Giannico to be the most complete for the Oregon coast. Larson and Palouse Creeks are also the site of the two life cycle monitoring stations, consisting of adult salmon traps and rotary screw traps for juveniles and smolts. A multitude of restoration actions have occurred over the years in these sub-basins, with intensities and types varying among the different basins. Project-effectiveness monitoring has evaluated tide gate replacements for fish passage and the effects of riparian planting on stream temperatures and sediment reduction. We are also just starting an OWEB-funded research grant with Dr. Giannico at O.S.U. to evaluate juvenile coho passage through tide gates and movement within tide gated stream networks.

Heads of Tide. The Heads of Tide region consists of the upper tidal (saline and fresh) portions of the Millicoma River and the South Fork Coos Rivers, tributary stream sub-basins entering into the rivers, and smaller valleys draining directly into the mainstems. The lower Coos River, Millicoma River, and South Fork Coos Rivers are broad, with widths of between 15m and 50m with tidal ranges of up to 2m in the lower area. Head of tide on the S. Fork Coos River is at River Mile (RM) 20.5 above Coos Bay, while on the Millicoma River it is at RM 17 on its E. Fork tributary. There are no tide gates on tributary streams in the Heads of Tide focus area. Tributary streams enter the mainstems after cutting through broad benches adjacent to the active river channels. Valleys are typically narrow, and stream gradients are steeper as they climb out of the bench. Anadromous fish passage is usually between 0.5km and 3km before barriers are reached, with coho spawning habitat present in the upper passable areas. The valleys and tributary streams provide valuable thermal refugia in the summer, and rearing habitat during winter high flows. We have completed an intensive watershed assessment for this area and will be finalizing the restoration action plan in 2008. This area has been the focus of our riparian restoration projects, both on the mainstems and on smaller tributaries. By the end of 2008, we will have completed restoring fish passage to all reasonably feasible sites in the assessment area. We have existing projects and proposals to reduce road-related sediment in the area. Monitoring in this area is focused on evaluating the use of the mainstem and tributary stream areas for juvenile coho rearing.

Upper West Fork Millicoma River. This HUC 6th field sub-basin is entirely located within the Elliott State Forest managed by the Oregon Department of Forestry. The upper West Fork Millicoma River is approximately 15m in Active Channel Width (ACW) at its lower portion in the focus area, narrowing to about 5m at the upper extent of anadromous fish use. Major tributary streams include Elk, Cougar, Deer, Fish, and Knife Creeks. Elk Creek has a number of named, smaller tributaries. Many forest stands adjacent to stream are in marbled murrelet management areas (MMMA), and the existing Riparian Conservation Strategy provides for extensive buffers. Restoration projects since 1996 have completely replaced all fish passage impediments at culverts, and large wood placements have occurred at high densities in the upper West Fork above Deer Creek and in most of the tributaries. Several roads have been decommissioned, and other sediment-reduction road upgrades have been undertaken. Current restoration plans include moving downstream below Deer Creek to place engineered boulder-wood structures to re-establish historic log jams. The CoosWA participated in the consulting team that prepared the Elliott State Forest Watershed Analysis (2004), and continues to work closely with the Forest to implement its recommendations. We have an intensive project-effectiveness monitoring effort in this focus area to evaluate the large wood placements.

Bottom Creek. Bottom Creek is an upper watershed HUC 6th field entirely within the Weyerhaeuser Millicoma Tree Farm. The mainstem Bottom Creek and its major tributary, North Fork

Bottom Creek are low gradient streams, with 3m to 10m ACW. There are no impediments to fish passage below Bottom Creek's confluence with the South Fork Coos River. However, many of the larger channels have bedrock substrate due to historic steam cleaning activities. This area is in industrial timber production, with the hillslopes growing short-rotation (35 – 45 year) Douglas fir plantations. Riparian buffers meet the Oregon Forest Practice Act minimums, but because roads parallel much of one side of Bottom Creek the riparian buffer width is constrained. Collaborative restoration projects between Weyerhaeuser Timber Company and CoosWA began in North Fork Bottom Creek in 1995 with the placement of boulder weirs. A significant number of fish passage culvert improvements have been installed, existing funding is available for three of the remaining sites, and a final road improvement grant was submitted to OWEB in October, 2007. Our intent with Weyerhaeuser is to proceed to improve stream complexity through large wood placement. This focus area was the site of one of our first project-effectiveness monitoring studies in 2001 that evaluated the fish passage and boulder weir placements. We have requested OWEB funding for additional aquatic habitat surveys, juvenile snorkel surveys, and spawning surveys as part of project-effectiveness monitoring for this focus area.

3. PROPOSED RESTORATION AND EVALUATION ACTIVITIES

This section of our Model Watershed Program proposal outlines the activities needed to meet the three goals of the project. There are specific goals for assessment and monitoring, watershed restoration, and socio-economics, all inter-related within our overarching goal to improve the health of the Coos watershed. We have identified, and will discuss, project objectives that need to be fulfilled for each of the three goals to be achieved. The discussion of the goals and objectives is related to the monitoring matrix presented in Section 4 of this proposal.

Assessment and Monitoring Goal. The goal of the assessment and monitoring program is to gain an understanding of the status and trends of watershed characteristics and the cumulative effects of restoration projects and programs. To achieve this goal, we have identified five objectives that need to be completed. These objectives provide for the statistical study designs and analyses methods, the assessments and action plans that identify baseline conditions and target needed restoration actions, and a certification system to provide a widely-recognized structure to evaluate progress.

Objective 1: Understand the Status and Trend of Coho Salmon Spawners, Coho Juveniles, and Aquatic Habitat in the Coos Basin.

The existing EMAP status and trend monitoring (spawning, rearing, and habitat) conducted by ODFW for the Coastal Salmon Inventory Project (CSIP) provides reasonable precision down to the Coos Basin + Big Creek level (more-or-less a HUC 4th field). Status and Trend information can use the existing sampling effort at smaller scales (i.e., HUC 5th & 6th fields), but the precision of the estimates will be lower. How much loss of precision going to finer scales is unknown until the analyses are completed.

Understanding the status and trend of important indicators of watershed restoration effects—such as coho spawners, coho juveniles, and aquatic habitat—at multiple spatial scales provides information needed for a variety of analyses. It provides an indication about the effects of ocean conditions on fish populations, can be used in the identification of limiting factors, and is useful to “control” for natural variation in larger-scale effectiveness monitoring.

It will be possible to get better precision by supplementing the existing surveys using the same sample frame developed for ODFW. Generally, this would involve “densifying” the number of samples taken in the areas desired; and the resulting level of precision would be dependent upon the number of additional samples. We would need to identify a desired level of precision of the estimates prior to the sample draws. Presumably the sampling scheme would be similar to the matrix presently used by ODFW, with some additional sites sampled each year, others on a rotating basis, and the yearly addition of some random sites. The 1:24,000 sample frame drawn in 2007 would be adequate to establish this increased sampling effort.

- Strategy 1. The Coos Watershed Association (CoosWA), with the BEF, will obtain and install sufficient equipment and software, and train personnel, to create an archive, and analyze, data on status and trend conditions in the Coos basin.
- Strategy 2. The CoosWA will work with Don Stevens and associates at the OSU Statistics For Natural Resources program to determine the precision of estimates of coho spawning, juvenile rearing, and aquatic habitat in the current CSIP program at the Coos basin, the three HUC 5th Field watersheds in the basin, and four HUC6th Field focal basins.
- Strategy 3. After completion of Strategy 1, and with consultation with BEF and other advisers, CoosWA will work with OSU to develop estimates of the additional sampling needed at the three spatial levels to provide reasonable and useful status and trend information on spawning, juvenile rearing, and aquatic habitat.
- Strategy 4. Based on the availability of adequate resources, CoosWA in cooperation with ODFW and other partners will conduct the supplementary sampling needed to achieve an adequate precision in an EMAP-based status and trend monitoring at the three spatial scales identified in Strategy 2.

Objective 2. Determine the Cumulative Effects of the Watershed Restoration Program on Critical Indicators of Watershed Health

Determining cause-and-effect relationships between watershed restoration projects—either singularly or in aggregate—will be difficult without an experimental design that includes tightly-controlled treatments and controls. A general consensus is that establishing “strong evidence of association” or “weight of evidence” between treatments and response is a more realistic goal given the situation in the Coos basin. There are three different approaches to meet this objective that are worth examining:

- Strategy 1. Use a dose-response gradient in 7th field watersheds (within the four 6th field focal basins) to evaluate the aggregate effects of different levels and kinds of restoration treatments.
- Strategy 2. Identify the “Variability Structure” of the target watersheds (HUC 7th Fields). These variability structures contain measurement, seasonality, and local effects. To create these variability structures, we first need to classify the HUC 7th fields by natural features (geomorphology), ownership, current condition, management practices, and restoration treatments.
- Strategy 3. Determine a response variable(s) that is (are) indicative of “watershed health.” This will be the key to successful cumulative effects determination. Salmon,

given their cycles and difficulty in “controlling” for ocean cycles and natural variability, present the most difficult response variable to accurately support, yet they are what most of the public and funders are interested in knowing about. Bob Hughes (USEPA-WED) has developed a Fish-IBI (index of biological integrity) for the Oregon Coast that may be promising.

Strategy 4. Based on the availability of adequate resources, CoosWA in cooperation with ODFW and other partners will conduct project-effectiveness monitoring needed to develop the dose-response gradient information identified in Strategy 1. This strategy will be coordinated with the Watershed Restoration Goals and Objectives to insure that various levels of restoration treatments within HUC 7th Field sub-basins are available for incorporation into the treatment gradients.

Objective 2 is fundamental to being able to determine the cumulative effect of restoration programs at various spatial scales. However, the analyses needed to fulfill its Strategies can be undertaken concurrently with Objective 1’s Strategies.

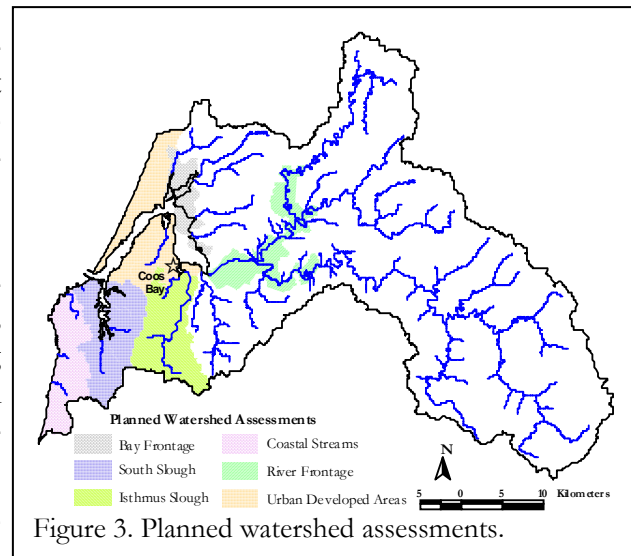
Objective 3. Complete and Update Watershed Assessments.

As discussed in Section 2 of this proposal, watershed assessments have been completed for the vast majority of the Coos basin. However, some of these assessments are now over 10 years old, and their level of detail and the attributes emphasized are not necessarily consistent with those currently used. Because these assessment provide crucial baseline data—as well as identify restoration opportunities—it is essential that they be completed and consistent across the entire watershed.

Strategy 1. Complete watershed assessments using CoosWA’s current process for those areas identified in Figure 3 that do not presently have them.

Strategy 2. Update watershed assessments on a 10 year interval incorporating current methodologies while at the same time insuring that important data reported in previous editions remains consistent in subsequent ones.

Strategy 3. Where it is infeasible to completely revise an older watershed assessment, data important for identifying restoration opportunities (such as road surveys and aquatic habitat inventories) should be collected and analyzed.



Objective 4. Create Action Plans To Identify and Prioritize Watershed Restoration Needs.

This Objective uses information from the watershed assessments (Objective 3), as well as intensive coordination with landowners in the various sub-basins and other partners, to identify and prioritize potential restoration actions. Restoration plans will include limiting factor analyses for

coho salmon, involvement of stakeholders to identify the political and social acceptability of various potential restoration project types, and use the prioritization process developed for the Coos Bay Lowlands Watershed Assessment and Action Plan to rank restoration needs in a spatially-explicit form for each HUC 7th Field sub-basin. The resulting Action Plans will form the basis of future restoration program actions (see next Goal).

Objective 5. Obtain ISO 14001 Environmental Certification For the Coos Watershed.

The International Standards Organization (ISO) has a certification process to ensure that manufacturers meet quality assurance/quality control (QA/QC) practices. ISO 14001 is an internationally accepted specification for an environmental management system, and is generic and flexible enough to apply to any organization producing any product or service anywhere in the world. It specifies requirements for establishing an environmental policy, determining environmental aspects and impacts of products/activities/services, planning environmental objectives and measurable targets, implementation and operation of programs to meet objectives and targets, checking and corrective action, and management review. While we are not familiar with use of the ISO 14001 certification for an entire watershed, the Weyerhaeuser Timber Company has ISO 14001 certification for the Millicoma Tree Farm, and we anticipate using their program as a model to assist in designing ours.

- Strategy 1. Make contact with potential ISO 14001 collaborators, including the forest industry's National Council For Clean Air and Water, to determine interest in supporting certification for the Coos watershed.
- Strategy 2. Compile our existing assessments, action plans, and this monitoring program into a format needed for the certification process.
- Strategy 3. Identify an external auditor and obtain funding to have the audit conducted.

Use of the ISO 14001 certification process is strongly encouraged by the U.S. Environmental Protection Agency for their regulatory programs. Because of its unique application to watershed management, we anticipate significant interest and support for our pilot project.

Watershed Restoration Goal. The goal of the watershed restoration program is to restore sustainable, fishable populations of coho and other native species by improving freshwater and estuarine watershed conditions. Three objectives to achieve this goal are (1) to improve access to juvenile rearing and adult spawning habitat, (2) improve stream, estuarine and riparian habitats, and (3) restore food webs. The matrix in Section 4 of this proposal provides details on how these objectives will be fulfilled. For this discussion, we will focus on how the CoosWA's Restoration Projects Committee has identified strategies to meet restoration priorities throughout the watershed. These strategies, described in Table 3, center on four different regions with the watershed as shown in Figure 4: the Estuarine, the Lowlands, the Head-of-Tide, and the Forest areas.

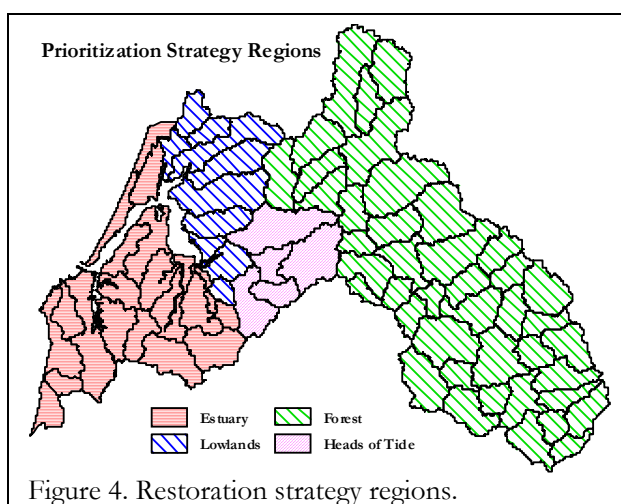


Figure 4. Restoration strategy regions.

Table 3. Strategies to sustain and restore conditions in the Coos watershed.

STRATEGY	APPROACH	BENEFITS	DRAWBACKS
<i>Protect and restore the best habitat</i>	Fully restoring and protecting the most productive areas first to maximize biological integrity.	Often more successful to protect / enhance functioning systems than to work on severely damaged areas. More cost-effective if long-term protection insured. Serves as anchor habitat to seed other areas. Preserves key habitats. Can be used as a reference condition.	May be little improvement to already functional areas. Owners of quality habitat may not see the need for conservation efforts. Future owners could drastically change management practices without adequate habitat protection.
<i>Address coho habitat bottlenecks</i>	Identify bottlenecks to production of coho salmon.	Most likely approach to increase coho populations. Programmatically cost-effective. Attractive to funders. Has clear goals and objectives.	Based on models that have some uncertainty. Data intensive. May be limited by landowner willingness to participate. May have secondary bottlenecks.
<i>Fix the worst habitat</i>	Rehabilitate the most highly impaired habitat.	Working in areas that have a lot to gain. Alleviate damage to down-stream reaches. Raises the local 'standard' among landowners. May be the last chance to 'save' an area.	Even with large expenditures, system may, as a result of chronic or residual problems, be able to reach only moderate productivity. High risk of failure.
<i>Fill in the gaps</i>	Concentrate on areas with previous projects and aim to entirely restore or rehabilitate an area.	Bolsters previous projects. Enhances community pride, and may encourage neighbors to work together. Habitat connectivity enhances monitoring opportunities.	Lower individually-valued projects may take priority over higher individually-valued projects in other areas.
<i>Best biological response for the cost</i>	Concentrate efforts on projects and sites estimated to have the lowest expense for the greatest gain in productivity.	More projects accomplished with increasingly scarce funds. Highly efficient at the site-specific project scale. May be easier to secure funding.	Concentrates on economics rather than watershed processes. May ignore important, but expensive projects. May not make the most sense at the landscape level.
<i>Focus on partnerships</i>	Build and maintain relationships so that over time trust and partner self-sufficiency increases.	Familiarity may smooth the process. Known track record. Continuity of people and projects. Partner may be more likely to provide match. Focuses outreach. Partner may graduate from need for cost-share and assistance.	May appear as favoritism. May pass by others that need help more. May stray from focus on biological need and systematic approach.
<i>Opportunistic</i>	Pursue projects as the opportunity with landowners arises. Also known as "Picking the low hanging fruit" or "shotgun approach".	Landowner-friendly. Quick response to projects with low planning costs. Higher potential for fee-for-services opportunities. May help build partnerships	Projects don't build on one another and may not follow a natural sequence. Less favorable with grantors. Oriented towards project-specific goals.
<i>Greatest potential gain</i>	Concentrate on areas that have the largest disparity between the current smolt productivity and the intrinsic potential of coho and steelhead.	Has a high likelihood of resulting in efforts that will increase the population of target species.	Knowledge of stream-specific smolt production is data intensive. Approach is species specific and would de-emphasize less commercially important species.

The CoosWA Restoration Projects Committee’s preferred primary and secondary restoration strategies for the four regions in the watershed are shown in Table 4. These preferred strategies are based on an analysis of the restoration priorities in each region that address limiting factors, recognize the likelihood of success based on land ownership and land management patterns in the region, and explicitly weigh the potential benefits from restoration actions against their financial costs.

Table 4. Preferred restoration strategies by watershed region.

Region	Primary Strategy (ies)	Secondary Strategy (ies)
<i>Estuary</i>	Focus on Partnerships Opportunistic	Fix the Worst Best Biological Response for the Cost
<i>Lowlands</i>	Greatest Potential Gain Focus on Partnerships	Opportunistic Protect and Restore the Best Habitat
<i>Heads-of-Tide</i>	Greatest Potential Gain Focus on Partnerships	Protect and Restore the Best Habitat Address Coho Habitat Bottlenecks Fill in the Gaps Opportunistic
<i>Forest</i>	Greatest Potential Gain	Protect and Restore the Best Habitat Address Coho Habitat Bottlenecks Fill in the Gaps Best Biological Response for the Cost

The CoosWA’s intent over the ten year period of the BEF program is to continue its watershed restoration program using the strategies identified in Tables 3 and 4. We expect that we will annually implement restoration projects with partners that have a value on the order of \$1 million. Our general approach is to attempt to restore all components of a stream system before moving on to other areas. Typically, this approach first fixes any fish passage barriers at culverts, then focuses on reducing chronic and catastrophic sediment inputs from roads, and finally restores instream complexity through large wood placement and other channel modifications. For the estuarine and lowland areas, we will increasingly focus on wetland restoration, both estuarine fringe as well as freshwater wetlands.

Socio-economic Goal. The goal of the social-economic program is to engage the local community to restore the Coos watershed. To achieve this goal we have identified four objectives: (1) garner landowner and project partner interest in restoration; (2) increase public awareness about issues related to watershed condition, processes, and health; (3) provide watershed stewardship tools and training; and (4) support sustainable natural resource based economies. The CoosWA Research and Outreach Committee drafted an Outreach Plan that is intended to provide the direction to achieve these objectives. Specific strategies, hypotheses, metrics, and benchmarks are found in the Monitoring Matrix provided in Section 4 of this proposal.

Objective 1. Garner Landowner and Project Partner Interest For Restoration.

This objective focuses on landowners and project partners as the key linkage in our ability to implement watershed restoration projects. Our approach to achieving this objective will be to continue to host “coffee klatches” in sub-basins where we’re conducting watershed assessments, offer tours so that people can see actual restoration projects, continue to publicize our efforts through signs and the local media, and establish a “Friends of the Coos Watershed” group that would include many landowners and project partners.

Objective 2. Increase Public Awareness About Issues Related to Watershed Condition, Processes, and Health.

Many of the strategies identified in Objective 1 are also targeted towards meeting Objective 2. The major difference between these Objectives is that the former targets landowners and partners directly related to watershed restoration efforts, while this Objective is focused on the general public. The types of activities to support this Objective include general publications on watershed health made available in public spaces (libraries, City planning offices, etc.), tours and workshops targeted to more general interests rather than specific restoration project types, and invitations to “coffee klatches” for those residents located in the assessment areas. The “Friends of the Coos Watershed” will be the avenue to involve the general public in the activities of the Association.

Objective 3. Provide Watershed Stewardship Tools and Training.

Consistent with our *Mission Statement* and *Strategic Framework, 2005 – 2015* we will develop innovative watershed management tools and techniques. We will continue to build our Riparian Silviculture Monitoring System, and given extramural support, intend to beta-test it with other watershed councils prior to its broader release. We intend to provide training during 2008 in the application of the *Coastal Oregon Tidal Fringe HGM Wetland Guidebook* to other watershed councils and interested parties. We anticipate that if successful, the Friends of the Coos Watershed will provide the volunteer resources to offer additional workshops and training, such as the Master Watershed Steward program of OSU-Extension.

Objective 4. Support Sustainable Natural Resource-based Economies.

The Association will continue to work with local fishermen and aquaculture groups to support their industries. For fishermen, the CoosWA will continue the “Hire the Fisherman” employment program as long as funds are available. The fishermen hired will work in our restoration and monitoring programs. The CoosWA will continue to emphasize the importance of clean water to sustain Coos Bay’s oyster industry, and will seek opportunities to extend its DNA microbial source tracking to other critical areas (i.e., agricultural lands). Finally, the CoosWA will partner with local sustainable industries to demonstrate low impact development.

4. MONITORING MATRIX

Assessment & Monitoring Goal: Gain an understanding of the status and trends of watershed characteristics and the cumulative effects of restoration projects and programs.						
OBJECTIVES	ASSESSMENT & MONITORING STRATEGIES	HYPOTHESES	METRICS +protocols	BENCHMARKS + model/analysis +quantitative goals + timeline	UNCERTAINTIES	PARTNERS
1. Understand the status and trend of coho salmon spaners, coho juveniles, and aquatic habitat in the Coos basin by developing tools and techniques that allow for the determination of changes at various spatial scales.	<ul style="list-style-type: none"> A) Develop partnerships with statisticians. B) Improve organizational capacity to collect and analyze data. C) Develop EMAP-based sample frames and analysis tools to determine the precision and power of estimates of adult spawners, juveniles, and aquatic habitat. D) Operate two life cycle monitoring sites and compliment ODFW EMAP sampling. 	<p>H₁: Tools can be developed for local subbasins that accurately track status and trends.</p> <p>H₁: The EMAP sample frames can be used to identify the precision and power of estimates of coho spawners, juvenile abundance, and aquatic habitat at various spatial scales.</p>	<ul style="list-style-type: none"> ▪ Statistical power of population and habitat estimates. ▪ ODFW Life Cycle Monitoring Protocol ▪ Precision and power of abundances estimates and habitat condition at various spatial scales and sampling intensities. ▪ The ability to display the relationships between precision of estimates and their statistical power at various spatial scales and sampling intensities. 	<ul style="list-style-type: none"> ▪ The precision and power of the estimates of abundances and habitat at various spatial scales and sampling intensities. ▪ The ability to display the relationships between precision of estimates and their statistical power at various spatial scales and sampling intensities completed by the end of two years. ▪ Benchmark for the sensitivity analysis will be determined by the end of the first year. 	<ul style="list-style-type: none"> ▪ Funding ▪ While the EMAP protocols are well-defined, and have been used for smaller-scale sample frame development, their application to this specific type of analysis is untested. ▪ Predetermined precision and power levels may not be appropriate. ▪ Ability to develop and retain qualified staff. 	<ul style="list-style-type: none"> ▪ OWEB (Greg Sieglitz) ▪ OSU Statistics (Don Stevens) ▪ USEPA (Phil Larsen) ▪ BEF
2. Develop and test treatment response modeling techniques to determine the cumulative effects of restoration projects at various spatial scales.	<ul style="list-style-type: none"> A) Develop and test "dose-response" statistical techniques. B) Determine variability structure of watershed attributes at different spatial scales. C) Determine response variables that are indicative of watershed health. D) Collect data to develop and test modeling techniques. 	<p>H₁: Treatment: Dose-response statistical techniques can be used to identify cumulative effects (and relative contributions) from multiple restoration activities at various spatial scales.</p>	<ul style="list-style-type: none"> ▪ Precision of population and habitat estimates ▪ Statistical power of population and habitat estimates. ▪ ODFW Life Cycle Monitoring Protocol 	<ul style="list-style-type: none"> ▪ Modeling techniques developed and tested by the end of 5 years. 	<ul style="list-style-type: none"> ▪ Funding ▪ Predetermined precision and power levels may not be appropriate. ▪ Ability to develop and retain qualified staff. 	<ul style="list-style-type: none"> ▪ USEPA (Phil Larsen) ▪ BEF
3. Complete Watershed Assessments where needed, and update existing watershed assessments as needed.	<ul style="list-style-type: none"> A) Complete current assessments. B) Obtain funding for areas needing new assessments. c) Update assessments ≥ 10 years old. D) Conduct additional data collection to supplement existing surveys. 	<p>H₁: Watershed assessments will identify restoration activities</p> <p>H₁: Updated watershed assessments will show changes in watershed condition resulting from restoration activities</p> <p>H₁: Watershed assessments provide baseline for subsequent evaluations.</p>	<ul style="list-style-type: none"> ▪ Oregon Watershed Assessment Manual. ▪ Techniques used in the CoosWA Coos Bay Lowlands Watershed Assessment 	<ul style="list-style-type: none"> ▪ Complete new watershed assessments within five years. ▪ Update existing watershed assessments within 10 years. 	<ul style="list-style-type: none"> ▪ Private landowner/project partner cooperation ▪ Funding for new assessments. ▪ Ability to develop and retain qualified staff. 	<ul style="list-style-type: none"> ▪ BEF ▪ Oregon Department of Forestry ▪ Weyerhaeuser ▪ Bureau of Land Management
4. Create action plans that identify and prioritize restoration actions at the sub-basin level.	<ul style="list-style-type: none"> A) Complete objective. B) Work with project partners. 	<p>H₁: Action plans will reduce restoration project costs.</p> <p>H₁: Restoration potential can be maximized by working with project partners.</p>	<ul style="list-style-type: none"> ▪ Prioritize OSU Sea Grant process used for Coos Bay Lowlands Watershed Assessment 	<ul style="list-style-type: none"> ▪ Create new CoosWA Action plan within three years. ▪ Complete action plans for new assessments within one year of their completion. 	<ul style="list-style-type: none"> ▪ Private landowner cooperation ▪ Ability to secure funding. 	<ul style="list-style-type: none"> ▪ BEF
5. Obtain ISO 14001 Environmental Certification for the watershed	<ul style="list-style-type: none"> A) Build partnership to support certification effort. A) Synthesize assessment prioritization action plans. B) External Audits under ISO14001 program. 	<p>H₁: ISO14001 Certification will provide a structure to track restoration progress.</p> <p>H₁: ISO14001 Certification will attract resources to the CoosWA Assessment and Monitoring program.</p>	<ul style="list-style-type: none"> ▪ ISO14001 Certification Criteria 	<ul style="list-style-type: none"> ▪ Attainment of Certification within four years of beginning project 	<ul style="list-style-type: none"> ▪ Costs ▪ Coordination requirements 	<ul style="list-style-type: none"> ▪ Weyerhaeuser ▪ National Council for Clean Air & Water

Watershed Restoration Goal: Restore sustainable, fishable populations of coho and other native species by improving freshwater and estuarine rearing conditions.

OBJECTIVES	RESTORATION STRATEGIES	HYPOTHESES	METRICS +protocols	BENCHMARKS + model/analysis +quantitative goals + timeline	UNCERTAINTIES	PARTNERS
<p>1. Improve access to juvenile rearing and adult spawning habitat.</p>	<p>A) Improve fish passage at culverts and tide gates. B) Reconnect floodplains, side channels, and wetlands to streams and estuaries.</p>	<p>H₁: Juvenile and adult Coho abundance will increase in response to restoration activities. H₁: Specific life stage survival rates and condition of Coho increase in response to restoration activities. H₁: Culvert replacement/removal will increase juvenile and adult coho use of restricted habitat. H₁: Tide gate replacement/removal/relocation will enhance estuarine juvenile and adult coho survival. H₁: There are quantitative differences among various tide gate designs in their efficacy for fish passage and water quality. H₁: Restoration of an estuary transition coho juvenile life history is a outcome of restoration actions.</p>	<ul style="list-style-type: none"> ▪ Coho spawner escapement (adult salmon trap and spawning surveys). ▪ Juvenile coho fry estimates (snorkel surveys and smolt trap). ▪ Adult coho distribution (spawning survey). ▪ Juvenile coho movement (PIT tag antennae on tide gates). ▪ Percentage of culverts meeting current ODFW passage guidelines. ▪ Tide gate operations (hours open, velocity at outlets) ▪ Tide gate reservoir effects (water elevation, temperature, salinity, and sediment movement). ▪ Juvenile coho distribution (snorkel surveys). ▪ Juvenile and adult coho distribution (snorkel surveys, spawning surveys, and electroshock surveys). 	<ul style="list-style-type: none"> ▪ Adult coho abundance will increase 30% relative to a coast wide baseline of 1995 after 10 years. ▪ Increases of 30% in coho egg, and fry survival rates (coho life cycle model) after 10 years. ▪ Coho population responses at the local (HUC 7) scale exceed regional trends (comparison with EMAP to control for natural variation and ocean cycles) after 10 years. ▪ ODFW velocity criteria for adults and juveniles are met at 75% of culverts and tide gates (<5 feet/sec velocity at outlet for adult salmonids in culvert or tide gate 60-100 feet long; <2 feet/sec for juvenile salmonids) at end of 10 years. <p>Tide Gate Changes:</p> <ul style="list-style-type: none"> ▪ 50% of stream mouth tide gates open for a minimum of 25% of the day during critical passage periods for adult and juvenile passage at the end of 10 years. ▪ Salinity wedges and mixing zones exist at 50% of stream mouth tide gate pools after 10 years. ▪ Backwater reservoir pool temperatures meet DEQ criteria in at least some stratifications in 50% of stream mouth tide gate pools after 10 years. 	<ul style="list-style-type: none"> ▪ Private landowner cooperation ▪ Ability to secure restoration funds. ▪ Ability to implement restoration strategies on private property. ▪ Ocean conditions, weather patterns, and changes in sea level. ▪ Global climate change. ▪ Ability to accurately measure coho abundances and survival rates. ▪ Ability to compare ecological condition at local and regional scales ▪ Ability to relocate/remove roads is limited ▪ Tide gates may be necessary to maintain agricultural land practices in some places. 	<ul style="list-style-type: none"> ▪ Oregon Department of Fish & Wildlife ▪ Oregon Department of Environmental Quality ▪ U.S. EPA (Phil Larsen) ▪ Oregon State University (Guillermo Giannico & graduate students, Don Stevens ▪ Coos County Road Department ▪ Local Drainage Districts ▪ NRCS; ▪ DEQ ▪ Local landowners
<p>2. Improve stream, estuarine, and riparian habitat</p>	<p>A) Increase instream habitat complexity (e.g., large wood and boulder placements) B) Reconnect floodplains, side channels, and wetlands to streams and estuaries (e.g., channel reconstruction; beaver encouragement). C) Re-establish riparian buffers</p>	<p>H₁: Wetland restoration and reconnection projects will attain high levels of HGM wetland functionality. H₁: Restoration activities will increase pool area, and residual depth. H₁: Restoration activities will increase area and quality of spawning gravels. H₁: Restoration activities will increase LWD volume. H₁: Restoration activities will increase juvenile coho densities in project areas.</p>	<ul style="list-style-type: none"> ▪ Habitat condition (ODFW Habitat Benchmarks for riffle gravel, pools, and large wood). ▪ Channel and floodplain morphology (cross-section, bankfull, sinuosity and flood prone width). ▪ Land cover type (aerial photography and GIS mapping by habitat type). ▪ Estuarine wetland condition (HGM, DSL). ▪ Regional habitat conditions (EMAP). ▪ Juvenile densities (snorkel surveys). 	<ul style="list-style-type: none"> ▪ Within the Coos Watershed, 50% of the streams in the Elliott S.F. and 25% of the streams in the Weyerhaeuser Tree Farm will achieve ODFW habitat benchmarks (Moore 1997) after 10 years. ▪ 100% of estuarine fringe wetlands available for access will have HGM functional assessments completed within three years. ▪ Annually restore 1.5 miles of stream with large wood. ▪ Annually cooperate in 20 acres of riparian restoration. ▪ Annually maintain riparian restoration projects for five years if landowners desire. 	<ul style="list-style-type: none"> ▪ Private landowner cooperation. ▪ Ability to secure funding. ▪ Existing infrastructure such as roads, homes, or agricultural fields may require flood protection. ▪ "No net gain" wetland sentiments. ▪ Large wood placements in populated areas or near tide gates may be contentious. ▪ Some instream habitat project design is experimental and may not function as expected. ▪ Ability to accurately measure juvenile densities. 	<ul style="list-style-type: none"> ▪ NRCS; ▪ DEQ; ▪ OWEB ▪ Local and private landowners ▪ Local drainage districts ▪ Oregon Department of Fish & Wildlife ▪ NRCS

Watershed Restoration Goal: Restore sustainable, fishable populations of coho and other native species by improving freshwater and estuarine rearing conditions.						
OBJECTIVES	RESTORATION STRATEGIES	HYPOTHESES	METRICS +protocols	BENCHMARKS + model/analysis +quantitative goals + timeline	UNCERTAINTIES	PARTNERS
3. Restore food webs	<p>A) Reduce sediment inputs to streams.</p> <ol style="list-style-type: none"> Road maintenance, upgrades, and decommission. Landslide area protection. Implement farm plans. <p>B) Improve riparian function.</p> <ol style="list-style-type: none"> Reduce prevalence of exotic/invasive plants in riparian buffers / Re-vegetate lowland areas with diverse species. Maintain riparian areas to preserve their functions. <p>C) Restore wetlands</p> <ol style="list-style-type: none"> Expand freshwater and estuarine wetlands. Improve functional condition of existing wetlands, especially at mitigation sites. 	<p>H₁: Sediment reduction projects will decrease sediment deposition in streams.</p> <p>H₁: A reduction in fine sedimentation will increase egg-to-fry survival.</p> <p>H₁: Riparian restoration will increase stream shading and reduce summer stream water temperatures.</p> <p>H₁: Removing impediments to bed load transport (e.g., undersized culverts) will improve natural bed load transport leading and improve hyporheic flows.</p> <p>H₁: Large wood placements will improve instream habitat complexity.</p> <p>H₁: Re-establishment of riparian zones can be enhanced by riparian forest re-establishment techniques (e.g. weed mats).</p> <p>H₁: Survival and growth of riparian plantings is related to the level and frequency of maintenance.</p> <p>H₁: Restoration strategies will result in a more diverse and distributed food web.</p> <p>H₁: Restoration activities will help achieve established water quality standards (ODEQ).</p>	<ul style="list-style-type: none"> ODFW Habitat benchmarks, Salmonid distribution (spawning and snorkel surveys) Streambank stability (USEPA). Road ditch lengths and connectivity to streams Number of culverts not sized to pass 100-year storm flows. Turbidity and TSS (ODEQ protocol). Landslide location, size, and frequency (Aerial photos; GIS; Stream temperature (OnSet data loggers deployed year-round). Weed cover and distribution (plant surveys). Riparian canopy cover (Solar pathfinder and vegetation categorization). Condition of riparian plantings (<i>Coastal Oregon Riparian Silviculture Guide – Intensive Monitoring Protocols</i>). Stream and estuarine water quality (ODEQ water quality standards). Washington SalmonWeb (http://www.cbr.washington.edu/salmonweb/) Karr, Benthic Index of Biological Integrity (B-IBI). 	<ul style="list-style-type: none"> In the Coos watershed, 50% of the Elliott S.F. and 25% of the Weyerhaeuser Tree Farm has <10-15% sand/silt/ organic, and >35% gravels in suitable habitat streams after 10 years. 50% of stream lengths in lowland areas have >90% stable banks after 10 years. 90% of road ditches delivering to streams are <200 feet long; 10% of ditches are within 25% of the BMP (ODF 2003 BMP guidelines), and <15% hydrological connectivity on all mainline and tie roads after 10 years. 50% decrease in 25 year recurrence storm interval road-related landslide frequency. 50% of streams <10m ACW meet ODEQ criteria of <64°F 7-day maximum after 10 years. 50% of CoosWA riparian plantings have an average of 75% survival after 5 years from establishment. 75% decrease in area/quantity of noxious weeds/exotic species in riparian restoration areas after 5 years from establishment. 50% of streams <10m ACW that are at <50% of their shade potential have riparian restoration projects after 10 years. At the Watershed Scale, Benthic IBI scores will show a 25% improvement in areas with average scores <35 after 10 years. 	<ul style="list-style-type: none"> Private landowner cooperation Ability to secure funding. Forest practices are governed by state law and CoosWA has very little opportunity to constrain harvests. Ability to relocate/remove roads is limited. Effects of Global Climate Change. Invasion by new exotic species. Unfiltered nutrient run-off (e.g., livestock, septic). Beaver removal/ introduction. Large storm events, accidents, or natural disasters. Wild sources of bacteria may confound E. Coli controls. 	<ul style="list-style-type: none"> Coos County Road Department Local landowners NRCS Coos SWCD Oregon Department of Forestry Weyerhaeuser Timber Company Menasha-Campbell Group Lone Rock Timber Company DEQ ODA Coos SB1010 Committee Oregon Department of Fish & Wildlife

Socioeconomic Goal: Engage the local community to restore the Coos Bay Watershed.						
OBJECTIVES	OUTREACH STRATEGIES	HYPOTHESES	METRICS +protocols	BENCHMARKS + model/analysis +quantitative goals + timeline	UNCERTAINTIES	PARTNERS
1. Garner landowner and project partner interest for restoration.	<ul style="list-style-type: none"> A) Use the "Coffee-Klatch" outreach process to prioritize restoration projects. B) Publish outreach materials and communicate with landowners. C) Aggressively seek continued local and in-kind financial support. D) Demonstrate successful and visible restoration projects. E) Organize "Friends of the Coos Watershed" group. 	<p>H₁: Community engagement and support will facilitate long-term restoration actions.</p> <p>H₁: Active community involvement will provide volunteers and financial resources to CoosWA.</p>	<ul style="list-style-type: none"> ▪ Participants in CoosWA meetings and educational activities. ▪ Volunteer hours. ▪ Landowners participating in programs. ▪ Businesses, NPO's, government agencies, and others in partnerships with CoosWA. ▪ \$ value of projects, % administrative cost, and \$ value of improvements paid by partners annually and per project. ▪ Length/acres of riparian, aquatic, and terrestrial habitats (e.g. wetland) restored or in conservation stewardship. 	<ul style="list-style-type: none"> ▪ Annually have ≥ 10 landowners participating in restoration projects. ▪ Friends of Coos Watershed group will have 150+ members after three years. 	<ul style="list-style-type: none"> ▪ Communication ▪ Differing values ▪ Fear ▪ Time ▪ Money ▪ Ability to develop and retain qualified staff 	<ul style="list-style-type: none"> ▪ OWEB ▪ Local and county governments ▪ UO-Planning (Michael Hibbard) ▪ BEF
2. Increase public awareness about issues related to watershed condition, processes, and health.	<ul style="list-style-type: none"> A) Use the "Coffee-Klatch" outreach process to build public relations. B) Publish outreach materials and communicate with landowners. D) Demonstrate successful and visible restoration projects. E) Organize "Friends of the Coos Watershed" group. F) Encourage responsible recreation 	<p>H₁: Improved public awareness will reduce the need for restoration actions.</p> <p>H₁: Improved public awareness will improve understanding about environmental impacts of future development in the watershed.</p>	<ul style="list-style-type: none"> ▪ Watershed resident surveys. ▪ Participants in CoosWA meetings and educational activities. ▪ Volunteer hours. ▪ Landowners participating in programs. ▪ Businesses, NPO's, government agencies, and others in partnerships with CoosWA. 	<ul style="list-style-type: none"> ▪ Offer at least two project tours annually. ▪ Provide quarterly newsletter and annual report. ▪ Offer at least four workshops per year. 	<ul style="list-style-type: none"> ▪ Communication ▪ Differing values ▪ Fear ▪ Time ▪ Money ▪ Ability to develop and retain qualified staff 	<ul style="list-style-type: none"> ▪ OWEB ▪ Local and county governments ▪ UO-Planning (Michael Hibbard) ▪ BEF
3. Provide watershed stewardship tools and training.	<ul style="list-style-type: none"> A) Offer public workshops. B) Communicate with landowners and provide access to and publish outreach materials. C) Organize "Friends of the Coos Watershed" group. 	<p>H₁: Improved stewardship tools and training for private landowners will reduce the need for restoration actions.</p> <p>H₁: Improved stewardship tools and training for private landowners will facilitate restoration actions voluntarily implemented by landowners.</p>	<ul style="list-style-type: none"> ▪ Watershed resident surveys. ▪ Participants in CoosWA meetings and educational activities. ▪ Landowners participating in programs. ▪ Length/acres of riparian, aquatic, and terrestrial habitats (e.g. wetland) restored by private landowners. 	<ul style="list-style-type: none"> ▪ Reach at least 120 people/year with training workshops. 	<ul style="list-style-type: none"> ▪ Communication. ▪ Time. ▪ Money. ▪ Ability to develop and retain qualified staff 	<ul style="list-style-type: none"> ▪ OWEB ▪ Local and county governments ▪ BEF
4. Support sustainable natural resource-based economies.	<ul style="list-style-type: none"> A) Improve and sustain good water quality. B) Restore healthy fish populations. C) Sustainable natural resource management. D) Encourage responsible recreation. 	<p>H₁: Businesses based on clean water, healthy forests, healthy fish populations, and other river-related environmental services will sustain or expand their profitability and/or employment opportunities.</p>	<ul style="list-style-type: none"> ▪ Profits and number of jobs in oyster farms, local fishing, forestry, agriculture, and recreation. ▪ Avg. Coos County per-capita personal income. 	<ul style="list-style-type: none"> ▪ >75% of restoration contracts will be awarded to local small businesses. ▪ Partner with at least two "Green" businesses per year for joint projects. 	<ul style="list-style-type: none"> ▪ Impacts of national and global economies. ▪ Global climate change and natural disasters. ▪ Individual business management. ▪ Ability to link economic changes to changes in watershed condition. 	<ul style="list-style-type: none"> ▪ OWEB ▪ Local and county governments ▪ UO-Planning (Michael Hibbard)

5. MODEL WATERSHED BUDGET

We have outlined an extremely intensive and broad-ranging monitoring program in this proposal. As we developed 10 year budgets for the program it became apparent that the resources needed to create such a vigorous monitoring program, was beyond what could reasonably be requested from the Bonneville Environmental Foundation. Nonetheless, we feel that it is important to provide a complete program budget in this proposal, with the understanding that developing the resources to implement it will require the efforts of both parties. In this Section of the proposal, we will outline the steps taken to create a 10-year budget for the entire CoosWA monitoring program, including the portion identified in the BEF project as well as our on-going life cycle monitoring and project-effectiveness monitoring programs. We include these other two efforts because they will provide partial support for staff, as well as contribute data for incorporation into the BEF project. We do not include estimates of resources needed for the assessment, restoration, and outreach programs of the Association. However, we do expect that there will be resource support for partial FTE's for staff from these programs.

We began by determining the staff required to carry out the task identified in Section 3 and the Monitoring Matrix. For these staff, we identified the proportion of their FTE that would contribute directly to the BEF project, and what proportion would be allocated to the other CoosWA programs. Table 5 shows the results of this apportionment to the BEF program.

Staff Position	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Executive Director	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.2
Monitoring Coordinator	0.5	0.5	0.5	0.5	0.75	0.5	0.5	0.5	0.5	0.75
Monitoring Technicians										
GIS /Database	0.5	0.5	0.3	0.3	0.5	0.3	0.3	0.3	0.3	0.5
BEF Monitoring	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Project Effectiveness	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Life Cycle Monitoring	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Outreach (RARE Vol.)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2

Table 5 shows the results of this apportionment to the BEF program.

We anticipate designating a Monitoring Coordinator whose primary responsibility will be to execute the BEF Monitoring Program. Because of startup and periodic program reviews (see Schedule in Section 6 of this proposal), the CoosWA Executive Director will dedicate approximately 20% of his/her time to the BEF Program in Years 1, 2, 5, and 10. We expect that the CoosWA will have four monitoring technicians on staff during this project. These include a GIS/Database technician, whose efforts will mirror the startup and periodic program review needs. Two other technicians will be allocated approximately 40% to the BEF Program and will carry out the EMAP-based field work. The remainder of their FTEs will be employed in the OWEB project-effectiveness monitoring and potential fee-for-service monitoring activities (e.g. fish presence surveys). The Life Cycle Monitoring technician is anticipated to be fully funded outside the BEF Program, but in all cases, staffing will be flexible to meet monitoring requirements. We have requested funding for a RARE volunteer through an AmeriCorps/UOregon program; that volunteer is anticipated to dedicate 20% of their time to the BEF Program socio-economic goals.

BEF Program Funding Requirements. Table 6 provides our initial estimate of the BEF funding resources needed to staff the Model Watershed Program, while Table 7 shows the total

Table 6. Ten year budget requirements to fulfill the BEF Model Watershed Program monitoring objectives.

Budget Item	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
<i>Personnel Costs</i>										
Executive Director	19,636	20,421	10,619	11,044	22,971	11,945	12,423	12,920	13,436	27,948
Monitoring Coordinator	31,200	32,448	33,746	35,096	36,500	37,960	39,478	41,057	42,699	66,611
Monitoring Technicians										
GIS/Database	25,696	26,724	16,676	17,343	18,036	18,758	19,508	20,289	21,100	21,944
BEF Monitoring	19,456	20,234	21,044	21,885	22,761	23,671	24,618	25,603	26,627	27,692
Project Effectiveness	17,804	18,517	19,257	20,028	20,829	21,662	22,528	23,429	24,367	25,341
Life Cycle	0	0	0	0	0	0	0	0	0	0
Outreach Coordinator	<u>8,902</u>	<u>9,258</u>	<u>9,629</u>	<u>10,014</u>	<u>10,414</u>	<u>10,831</u>	<u>11,264</u>	<u>11,715</u>	<u>12,183</u>	<u>12,671</u>
Personel Sub-total	\$122,694	\$127,602	\$110,971	\$115,410	\$131,511	\$124,827	\$129,819	\$135,013	\$140,412	\$182,207
<i>Field Supplies</i>	2,050	2,050	2,050	2,050	2,050	2,050	2,050	2,050	2,050	2,050
<i>Field Equipment</i>	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
<i>Travel (miles)</i>	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500
<i>Computers/Software</i>	7,000	2,500	2,500	2,500	7,000	2,500	2,500	7,000	2,500	3,000
<i>Training/Conferences</i>	<u>5,000</u>	<u>5,000</u>	<u>5,000</u>	<u>5,000</u>	<u>5,000</u>	<u>5,000</u>	<u>5,000</u>	<u>5,000</u>	<u>5,000</u>	<u>5,000</u>
Direct Costs Sub-total	\$141,444	\$141,852	\$125,221	\$129,660	\$150,261	\$139,077	\$144,069	\$153,763	\$154,662	\$196,957
<i>In-Direct Cost (20%)</i>	<u>28,289</u>	<u>28,370</u>	<u>25,044</u>	<u>25,932</u>	<u>30,052</u>	<u>27,815</u>	<u>28,814</u>	<u>30,753</u>	<u>30,932</u>	<u>39,391</u>
GRAND TOTAL	\$169,733	\$170,222	\$150,265	\$155,592	\$180,313	\$166,892	\$172,883	\$184,516	\$185,594	\$236,348

Table 7. Anticipated ten year budget requirements for the entire CoosWA assessment, monitoring, and outreach programs.

Funding Souce	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Bonneville Environmental Foundation	169,733	170,222	150,265	155,592	180,313	166,892	172,883	184,516	185,594	236,348
Oregon Watershed Enhancement Board	167,224	173,589	180,209	187,094	194,255	201,702	209,446	217,501	225,877	234,589
Other Sources	<u>160,113</u>	<u>166,198</u>	<u>198,610</u>	<u>206,235</u>	<u>200,383</u>	<u>222,413</u>	<u>230,990</u>	<u>239,911</u>	<u>249,188</u>	<u>215,423</u>
GRAND TOTAL	\$497,070	\$510,009	\$529,084	\$548,921	\$574,957	\$591,007	\$613,319	\$641,928	\$660,659	\$686,360

program resource requirements, including assessment, monitoring, and outreach. Our expectation is that these funds would be acquired through the joint efforts of BEF and CoosWA.

Ability To Leverage Outside Funds. Table 7 shows the amount of funding necessary to operate the CoosWA assessment, monitoring and outreach programs over the next ten years. Our estimate of the funding available from the Oregon Watershed Enhancement Board (OWEB) is based on our past grants success with them. We anticipate continued funding over the next ten years for the operation of our life cycle monitoring sites on Larson and Palouse Creeks. We also anticipate additional funding for assessment, project-effectiveness, council support (Executive Director salary and expenses), and outreach. The required resources from “Other” sources represent the remainder of the FTE proportions not projected to be funded by OWEB (or DEQ in the case of the watershed assessments). These “Other” sources include our fee-for-service monitoring, contributions to the monitoring program by landowners and land managers within the watershed, and consulting income to support the Executive Director’s salary. Our existing OWEB-funded grants provide funding comparable to what we’ve identified in Table 7. Our fee-for-service and consulting programs are at their initial stages of development, but presently provide approximately 15% of the funding needed to operate the Association. The one major long term uncertainty in funding is the “sunset” of Measure 66 that designates 7.5% of the Oregon Lottery net proceeds for watershed restoration activities. Our expectation is that this Measure will be renewed in 2014.

6. TEN-YEAR MONITORING AND REPORTING TIMELINE

Table 8 shows our projected activities over the next ten years if the Coos Watershed Association is selected for the Model Watershed Program by the Bonneville Environmental Foundation. We anticipate that the first two years of the program will emphasize the development of GIS and databases needed to design the sampling strategy, consultation with statisticians to develop the sensitivity analyses needed to determine levels of precision and power for estimates of status and trend at various spatial scales, and begin to evaluate techniques to determine the cumulative effects of restoration activities. During this same period, the CoosWA’s assessment, life cycle monitoring, and project effectiveness monitoring will continue. We will use the first two annual evaluations of restoration project effectiveness to test the cumulative effects models.

During the remaining years of the project the sample designs will be implemented to supplement the standard EMAP ODFW Coastal Salmon Restoration Initiative surveys, continue CoosWA’s assessment and action planning, and carry out the project-effectiveness monitoring, needed for the cumulative effects analyses.

We anticipate periodic program reviews throughout the ten years of the project. These reviews will evaluate the study design in light of the results from the sampling and surveys, adjust the sampling as necessary, and provide an opportunity to compile and publish status reports. Periodic reviews are scheduled at the end of Year 2, Year 5, and a final review at Year 10. Each of these reviews will take approximately 6 months of staff time, and involve BEF, the Scientific Advisory Committee, and our project partners. Annual progress reports will be prepared for the intervening years. These annual reports—and the periodic reviews—will evaluate how well the project is addressing the watershed restoration and socio-economic goals in addition to the major monitoring objectives outlined in this proposal.

Table 8. Ten year monitoring and reporting timeline.

GOALS, OBJECTIVES, & ACTIVITIES	2008				2009				2010				2011				2012				2013				2014				2015				2016				2017							
	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4								
Assessment & Monitoring																																												
Study Design																																												
GIS & Database Development																																												
EMAP Sensitivity Analysis							®													®																				®				
EMAP Sampling Scheme							®													®																				®				
Dose-Response Model Test								®												®																				®				
Implement Monitoring Program																																												
Spawning Surveys																																												
Juvenile Surveys																																												
Macro-invertebrate Analysis																																												
Aquatic Habitat Inventory																																												
Live Cycle Monitoring																																												
Data Analysis																																												
Write Watershed Assessments																																												
Create Restoration Action Plans																																												
Obtain ISO 14001 Certification												®																																
Watershed Restoration																																												
Evaluate Fish Passage																																												
Evaluate Aquatic Habitat																																												
Evaluate Food Web Support																																												
Socio-Economic Impacts																																												
Evaluate Project Participation																																												
Evaluate Public Awareness																																												
Evaluate Watershed Training																																												
Evaluate Sustainable Industries																																												
Program Evaluation & Reporting																																												
Annual Progress Report				®								®				®								®				®				®				®								
Periodic Program Review								®												®																								
Final Project Report																																								®				

® indicates a report submitted during the quarter.