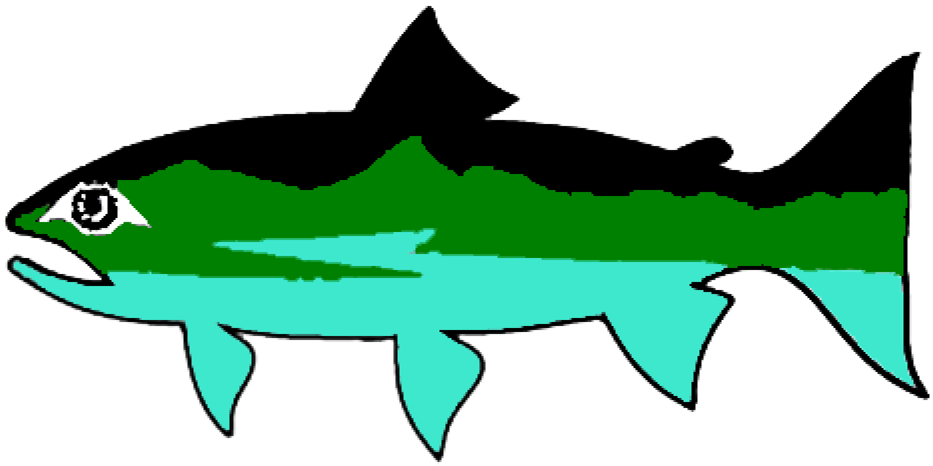
Aquatic and Riparian Effectiveness Monitoring Program
Interagency Monitoring Program – Northwest Forest Plan



2005 Annual Technical Report

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A copy of this report is also available on our Watershed Monitoring Website:
http://www.reo.gov/monitoring/watershed/

Summary

Highlights of Aquatic and Riparian Effectiveness Monitoring Program (AREMP) personnel accomplishments during 2005:

- Completed a Preliminary Assessment of Aquatic and Riparian Resources under the Northwest Forest Plan, which was published in fall 2005 by the Pacific Northwest Research Station as General Technical Report 646.
- Provided support to local units on the use of decision support models.
- Summer field crews sampled 27 sixth-field watersheds to measure physical, biological, and chemical attributes used to assess watershed condition.
- Refined the standardized core set of field protocols used by this program and the PacFish/InFish program (also known as PIBO).
- Initiated the use of data recorders to enter all field data at streamside. Crew leaders downloaded the data each evening onto a field laptop for storage and additional error checks. The use of data recorders included developing a set of data entry tables, in Pocket Excel, to enter and store all field data.
- Extended the utility of our quality control (QC) program by resurveying 20 QC sites first surveyed in 2004 to enable us to use this data for detecting watershed condition trends.
- Developing a landslide model to determine which topographic features are associated with landslides. A key component is assessing how to extend the landslide models used by the Coastal Landscape Analysis and Modeling Study to the extent of the Forest Plan.
- The program team leader continued to lead the Pacific Northwest Aquatic Monitoring Partnership watershed workgroup. The workgroup sponsored a side-by-side protocol comparison test for in-channel physical attributes in the John Day Basin, OR during summer 2005. Eleven different tribal, state, and federal agencies - including AREMP field crews - participated. The goal of the proposed side-by-side protocol comparison test is to determine the best protocols for assessing a common set of in-channel stream attributes.
- The cost of sampling 27 watersheds (and associated trend sites and quality control sites) was $49,600 per watershed, or $8,265 per sample site. This is based on sampling an average of 6 sites in each watershed.
- Student Conservation Association interns were utilized as a successful component of the summer field staff. Compared to hiring GS-0404-05 Biological Science Technicians, there was a $57,000 cost savings to the program.

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Introduction

Background

The Northwest Forest Plan (hereafter referred to as the Plan), a management strategy applied to 24 million acres of federal land in the Pacific Northwest, was approved in 1994. The Plan includes an Aquatic Conservation Strategy that requires the protection, rehabilitation, and monitoring of aquatic ecosystems under the Plan's jurisdiction (USDA-USDI 1994). The Aquatic and Riparian Effectiveness Monitoring Program (hereafter referred to as the monitoring program) was developed to fulfill the monitoring component of the strategy. The objectives of the monitoring plan include assessment of the condition of aquatic, riparian, and upslope ecosystems at the watershed scale; development of ecosystem management decision support models to refine indicator interpretation; development of predictive models to improve the use of monitoring data; providing information for adaptive management by analyzing trends in watershed condition and identifying elements that result in poor watershed condition; and providing a framework for adaptive monitoring at the regional scale (Reeves et al. 2004). Monitoring is conducted at the subwatershed scale (US Geologic Survey 6^{th}-field hydrologic unit code [HUC]). These subwatersheds (hereafter referred to as "watersheds") are approximately 10,000-40,000 acres in size.

The purpose of this report is two-fold. First, this report provides an overview of monitoring efforts in 2005. Second, this report serves as a track record for the program as well as indicating future direction of the program at the time of the report.

2005 Monitoring Program Objectives

During 2005, the program worked toward or accomplished several objectives:

- Conduct a 10-year preliminary assessment of the condition of watersheds under the Northwest Forest Plan.
- Refine decision support models and indicator evaluation curves developed during 2003 to provide support to local units on the use of decision support models.
- Complete in-channel surveys to measure physical, biological, and chemical attributes used to assess watershed condition in 27 watersheds.
- Refine the standardized core set of field protocols between this program and the PacFish/InFish program (also known as PIBO).
- Implement data recorders to collect field attribute data.
- Continue the Quality Assessment Program.
- Continue an assessment of landslides with data collection and a model development effort.
- Continue participation in the Pacific Northwest Aquatic Monitoring Partnership.
- Use Student Conservation Association interns on field crews.

A complete discussion of each of these objectives is provided in subsequent sections. Included for each topic is a brief overview and any pertinent progress or results. Updates are also provided for budget and personnel required to accomplish the tasks assigned to the module.

2005 Monitoring Program Accomplishments

Ten-Year Assessment of the Northwest Forest Plan

Ten years have passed since the Northwest Forest Plan (the Plan), a management strategy applied to 24 million acres of federal lands in the Pacific Northwest, was implemented. In 2004, we conducted the first qualitative assessment of the effectiveness of the Plan's aquatic conservation strategy at maintaining or improving the condition of watersheds in the Plan area. We aggregated road, vegetation, and in-channel data to assess the condition of sixth-field watersheds and describe the distribution of the condition of watersheds in the Plan area. The assessment was based on 250 watersheds selected at random within the

Plan area. The distributions of conditions were presented for watersheds and for many of the attributes that contribute to the condition of watersheds by land use allocation. Under the Plan, management activities were implemented in a way to promote positive changes in the condition of watersheds. This assessment revealed that the growth rate of trees (2 to 4 percent) exceeded losses (1.6 percent owing to stand-replacing fire and harvest), and nine times more roads were decommissioned than were constructed. Fifty-seven percent of the watersheds had higher condition scores in time 2 (1998-2003) than in time 1 (1990-96) across the entire Plan area. Only 3 percent of the watersheds had lower condition scores in time 2, and the scores did not change in the remainder of the watersheds. More key watersheds, which were given the highest priority for restoration activities, increased in condition than non-key watersheds. The greatest positive change in watershed condition occurred in late-successional reserves.

The resulting report (Gallo et al., 2005) was published in fall 2005 by the Pacific Northwest Research Station as General Technical Report 646. A copy of the report is available online at: http://www.fs.fed.us/pnw/publications/pnw_gtr647/.

Decision Support Models

This year we have assisted other programs in using the decision support models developed by the monitoring program, including:

- The Mt. Hood National Forest (NF) and Oregon Trout collaborated to build a model to identify anchor habitat for four species of anadromous salmon in the Sandy River Basin.
- The Okanagon, Wenatchee, and Colville NFs are using a simplified version of the monitoring program's decision support model in their upcoming Forest Plan revision.
- The Tongass NF used the monitoring program's decision support model as a starting point for developing a model for watershed condition assessments.

In each case, one of our team members led a workshop attended by the interested parties. During the workshop, we covered proper uses of decision support models, designed and constructed a model, and provided instruction how to use the software required to run models, so that each group could build and run their own model by the end of the workshop.

2005 Field Sampling Accomplishments

Twenty-seven watersheds spread throughout the Plan area were sampled during 2005 (Figure 1, Table 1). These watersheds were sequentially sampled from the subset of the two hundred fifty watersheds originally selected for monitoring the Northwest Forest Plan. The 250 watersheds were selected at random using Generalized Random Tessellation Sampling (GRTS) design, which guarantees a spatially balanced sample (Stevens and Olsen 2003, 2004). Watersheds had to contain a minimum of 25 percent federal ownership (USDA Forest Service, USDI Bureau of Land Management, or USDI National Park Service) along the total length of the stream (1:100,000 National Hydrography Dataset stream layer) to be considered for sampling in the monitoring plan. Twenty sites from 2004 were also surveyed for trend purposes (Table 2).

During the 2005 field season, 17 watersheds were dropped from the sample list for various reasons:

- Seven were dropped because most if not all stream channel sites on federal lands were dry;
- Six were dropped due to inaccessibility (crews were unable get into the watershed);
- Three were dropped because there was too much water to sample safely; *and*
- One was dropped due to marijuana growing operations in the watershed (crew safety).

Inter-Program Standardization of Field Protocols & Calculations

The monitoring program and the PacFish/InFish program (also known as PIBO; a large-scale federal monitoring program that focuses on managed and unmanaged lands in the upper Columbia basin; more information can be found at http://www.fs.fed.us/biology/fishecology/emp/index.html) were able to agree upon a common set of field protocols for a core set of attributes (Moyer et al., 2004). Discussions were reopened during the winter of 2004 and spring of 2005 to further refine these protocols. The majority of the revisions were clarification of interpretation and subsequent refinement of details in the protocols. For example, with respect to pool tail crest fines, the inclusion or exclusion of boulders in the wetted width was clarified for boulders that extend above the wetted channel as part of the total channel width.

We anticipate further standardization efforts in 2006. After using the protocols during the 2005 field season, there was a need for each program to revert to their original protocols in some instances (primarily for issues associated with the survey environment and also ties to historic datasets). For example, the two programs were unable to agree on the number of width measurements and location of those measurements for determining site length.

A detailed document (with clear graphic illustrations) outlining the 2004 agreed to protocols is available at http://www.reo.gov/monitoring/watershed/docs/2004-Final-AREMP-PIBO-Core-Attributes-Stream-Sampling-Protocol.pdf. An updated version of this document, reflecting changes discussed and agreed to in 2005 is available by contacting Kristina Fausti (541.750.7081). Each program then worked from the revised document to develop their final field protocol.

Implementation of Field Data Recorders

The monitoring program continued to increase the efficiency and quality control of the data collection/data entry component of the program. During the spring of 2005 we developed a set of data entry tables, in Pocket Excel, to enter and store all field data using a personal data recorder (hereafter, PDA). Crews entered all field data into the PDA and crew leaders downloaded the information each evening onto a field laptop for storage and additional error checks. The use of the PDA and Pocket Excel replaces the need for waterproof paper, mechanical pencils, and tatums used in previous years. As 2005 was the inaugural year, there is considerable room for improvement. Many of the ideas for improvement to the data entry interface came from crewmembers that spent many hours using the PDAs.

General advantages for using PDAs:

- Reduced the "end of season" data entry time from several weeks to a few days, i.e., no entering information from written data sheets.
- Quality Control of the entered data was less time consuming and errors were easily corrected after crew and data manager verification of data values.
- No loss of data due to misplaced datasheets and ineligible writing. It also greatly reduced the chance for missing data values.
- The overall amount of data entry was less than previous years because known values such as watershed name or HUC number was entered for field crews before they began field data collection.
- More overall security against data loss because copies of the original field data were saved into several locations, such as main memory of the PDA and compact flash, after the data was collected by the field crew.

Areas for improvement of the PDA program:

- Environmental stability of the PDAs is a concern. For example, even though the monitoring program uses environmental cases for each PDA, a leak or severe impact could cause the PDA to malfunction. (This did not happen this year, but the potential always exists.)
- The display on a PDA is small, so it requires the user to navigate frequently to different areas for data entry which is time consuming and points to the need for a user friendly interface.
- A risk of losing battery power in the field if the crew does not charge the unit on a daily basis while in the field. Loss of battery power renders the unit useless until it is charged again.
- There is a steep learning curve with new crewmembers. This, in turn, leads to the potential to loose data while they are still learning the "in's and out's" of the system.

Quality Assessment Program and Trend Detection

The underlying sample design that the monitoring program utilizes (both in the selection of watersheds and sites within watersheds) allows for repeat in-channel surveys in the same location. Initially this was used for blind checks of crew measurements, i.e., between crew comparisons of attribute measurements at the same site. However, as a function of the design, we were able to extend the utility by resurveying a subset of sites in the following year for trend detection. Due to the timing of this report, these analyses as well as the annual analyses of the QAQC data have not yet been conducted. (Addressing questions such as: How consistent are the crews amongst each other last year and with previous years?) The results will be posted on the monitoring programs website when they are completed this fiscal year (http://www.reo.gov/monitoring/report_show.php?show=watershed).

Statisticians with the Designs and Models for Aquatic Surveys program (http://oregonstate.edu/dept/statistics/epa_program/) put forth the idea of detecting trend in watershed condition by letting the trend in attribute values or decision support model scores at each site be a random variable. While this idea has yet to be explored, it has merit in that the program has surveyed 100 watersheds to date, but only 45 have been surveyed for trend and therefore can be used to detect trend. However, there are 70 sites (within those 45 watersheds) that could be used for trend. Further this idea harnesses both the power of the sample design (utilizing the sample selction probabilities rather than predictions from a modeling approach) and allows the monitoring program to evaluate the trend as a distribution rather than a single value.

Landslide Analyses

The monitoring program launched a project to expand the Coastal Landscape Analysis and Modeling Study (CLAMS) debris flow model developed by Dan Miller (http://www.earthsystems.net) to the geographic area encompassed by the Plan. Our intent is to incorporate landslides (rates, size, etc.) into the decision support models used to asses watershed condition. The model uses topography, land cover, geology, and roads to predict potential landslide density. Landslides in 14 watersheds spread throughout the Plan area (the first 14 watersheds surveyed in 2002 from the GRTS design; see above) are in the process of being mapped from aerial photos to develop and calibrate the landslide model. Two of the watersheds are in the CLAMS study area and have aerial photos for multiple years, which allow the calculation of a landslide rate through time. (The current CLAMS model only has data input from the 1996 winter storm event, therefore the new information will refine the model calibration and address landslide frequency.)

To date all the landslides are mapped from the aerial photos and the corresponding GIS data is prepared for the model analysis. The next step is the development and calibration of the debris flow model by Dan Miller. Once the model is developed, the monitoring program will complete the process of deriving debris flow potential for all the Plan area provinces.

Pacific Northwest Aquatic Monitoring Partnership

Support for the cooperative monitoring efforts between state, federal, and tribal agencies within Washington, Oregon, California, and Idaho – known as the Pacific Northwest Aquatic Monitoring Partnership (PNAMP) continued. The monitoring program team leader continued as the leader of the Watershed Workgroup (a subgroup of PNAMP).

Inter-agency side-by-side protocol test - The Watershed Workgroup coordinated a side-by-side protocol comparison test for in-channel physical attributes. The protocol test, held during summer 2005 in the John Day basin (eastern-central Oregon), had the following objectives:

- Identify and recommend a core set of indicators (attributes) and their associated protocols that state, federal, and tribal monitoring programs use for assessing status and trends in watershed condition.
- Conduct a peer-reviewed experiment to determine which of the existing field protocols for each attribute distinguish the most different streams.
- Incorporate additional information into the recommendation of protocols, e.g., cost, precision, accuracy, sensitivity to trend, repeatability, and has undergone statistical review.
- In parallel with developing a unified set of protocols, we will also develop calibrations for older protocols (crosswalks) in order to preserve the value of legacy data where possible.
- Recommend which physical, chemical, and biological in-channel attributes and robust protocols should be used.

The following state, federal, and tribal agencies participated:

- Aquatic and Riparian Effectiveness Monitoring Program;
- California Department of Fish and Game
- Colville Tribe
- EPA Environmental Monitoring and Assessment Program;
- Oregon Department of Fish and Wildlife;
- Oregon Department of Environmental Quality;
- Northwest Indian Fisheries Commission
- PacFish/Infish Biological Opinion Monitoring Program (PIBO);
- Upper Columbia Monitoring Program;
- USDA Forest Service Region 6 Stream Survey Program; and
- Washington Department of Ecology.

In addition, the USDA Rocky Mt Research Station intensively surveyed the same segments of stream and established a baseline set of values with which to compare the results of the different protocols. Preliminary analyses are expected to be completed during spring, 2006. This effort was funded by the US Department of Commerce National Oceanic and Atmospheric Administration, the USDI Bureau of Land Management, the USDI Bureau of Reclamation, the Oregon Watershed Enhancement Board, Bonneville Power Authority, and the USDA Forest Service – Washington Office.

Master sample design - The Watershed Workgroup remained engaged with scientists and statisticians from the US Environmental Protection Agency's Environmental Resources Laboratory – Corvallis to develop a master sample design for in-channel sites throughout the Pacific Northwest.

A master sample design will allow agencies to tier to a probabilistic sampling design. A random sample design is one of the requirements for data sharing among agencies (using common data collection protocols is the second requirement for sharing data). A master sample design opens the door to ideas such as creation of annual data summaries and annual reports on the condition of riverine, riparian, and watershed resources at multiple spatial scales. Further, this will allow tracking changes and trends over time at broad regional scales (e.g., statewide; ecoregion wide; federal lands; Interior Columbia).

Currently, a draft of a proposed master sample design based on using GRTS strategy is being developed. This design accounts for differences in scale (from local restoration projects to multi-state monitoring programs), density of sample points (from one sample point per 1000 m of stream to one sample point per 4th field HUC), and differences in objectives (changes in a stream channel on a sub-reach basis to changes across the Plan area). The state of Washington is in the process of developing a status and trend monitoring program and this program is proposed as a "case study" of how to integrate state and federal monitoring programs using the master sample design.

Program Updates

Fiscal Year 2005 Budget

During the 2005 field season, the program employed 37 persons directly tied to the summer fieldwork, five of which represent core staff. The balance represents temporary employees and SCA interns.

It cost $49,600 to sample each one of the 27 watersheds, or $8,265 per sample site. This is based on sampling an average of 6 sites in each watershed. These figures were derived from taking our total budget and dividing by the number of watersheds sampled, therefore the figures include sampling the trend sites and QA/QC sites, as well as overhead and other non-field related costs. We experienced a substantial increase in costs due to increases in renting vehicles from a private vendor, and increased costs associated with processing periphyton and macro-invertebrate samples.

Student Conservation Association Interns

Six student Conservation Association (SCA) interns were hired as crewmembers during the 2005 field season. Compared to hiring GS-0404-05 Biological Science Technicians, there was a $57,000 cost savings to the program. We also continued to collect high quality data, and provided valuable work experience to the interns. One of the GS grade employees we hired in 2005 was an SCA intern in 2004. Overall, this was a very successful partnership and one we hope to continue in 2006. We addressed concerns from the prior year by increasing intern per diem rates (to match the corresponding federal rates), and streamlined the process for getting interns their stipends and per diem checks from the SCA headquarters.

Written Products

Annual Watershed Reports and Data Available on Program Website

In order to better facilitate the use of field and GIS data by local area managers, the program continues to place the annual Watershed Reports and the associated data onto the monitoring program's website. Data from 2002 to 2004, as well as the 2005 field data are now available on the website. The current web page will be updated to show links to the reports and data. At the writing of this document, the reports will be posted at http://www.reo.gov/monitoring/reports.htm#watershed while the data will be posted under http://www.reo.gov/monitoring/maps.htm (this is subject to change depending on constraints of the website). Individual measurement data will not be posted on the web, however it is available by contacting the data manager, Jake Chambers (541.750.7067), who will provide individuals with requested information.

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Acknowledgements

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The program benefited greatly from contributions from Gordie Reeves, Phil Larsen, Brett Roper, Rick Henderson, Jeff Kershner, David Hohler, and Mike Furniss. Jon Grunbaum of the Klamath National Forest, John Sanchez of the Siuslaw National Forest, and Leo Poole of the Eugene district of the Bureau of Land Management provided support and guidance for the logistics of field crews.

Peter Eldred conducted analyses on upslope and riparian vegetation and roads, and constructed the map for this report. Jake Chambers oversaw data processing and database management. Sarah Hippenstiel provided valuable assistance with data processing. Andrea Norris handled travel and timesheets for the program during the field season. Steve Wilcox developed the field maps for the crews. Kris Fausti, and Ted Sedell handled field crew coordination. Mark Isley led, Brian Dwyer assisted, Brett Lyon and Ryan Lunt supported the continued development of the Field Recon component of the summer field effort. Summer field staff included: Pete Gruendike, Jennifer Kauffman, Mark Jessop, Chris Wall, Eugene Wier, Holly Truemper, Greg Huchko, Kathy Gwecke, Miko Nadel, Anson Friar, Zack Reeves, Scott Venables, Will Fargo, Morgan Garay, Jeff O'Leary, Jon Nott, John Speece, Abraham Karam, Rachel Chambers, Dave Brandt, Mark Breunig, Elysia Brunet, Polly Gibson, Lindsay Godfrey, T.J. Krug, and Jeff Metzger.

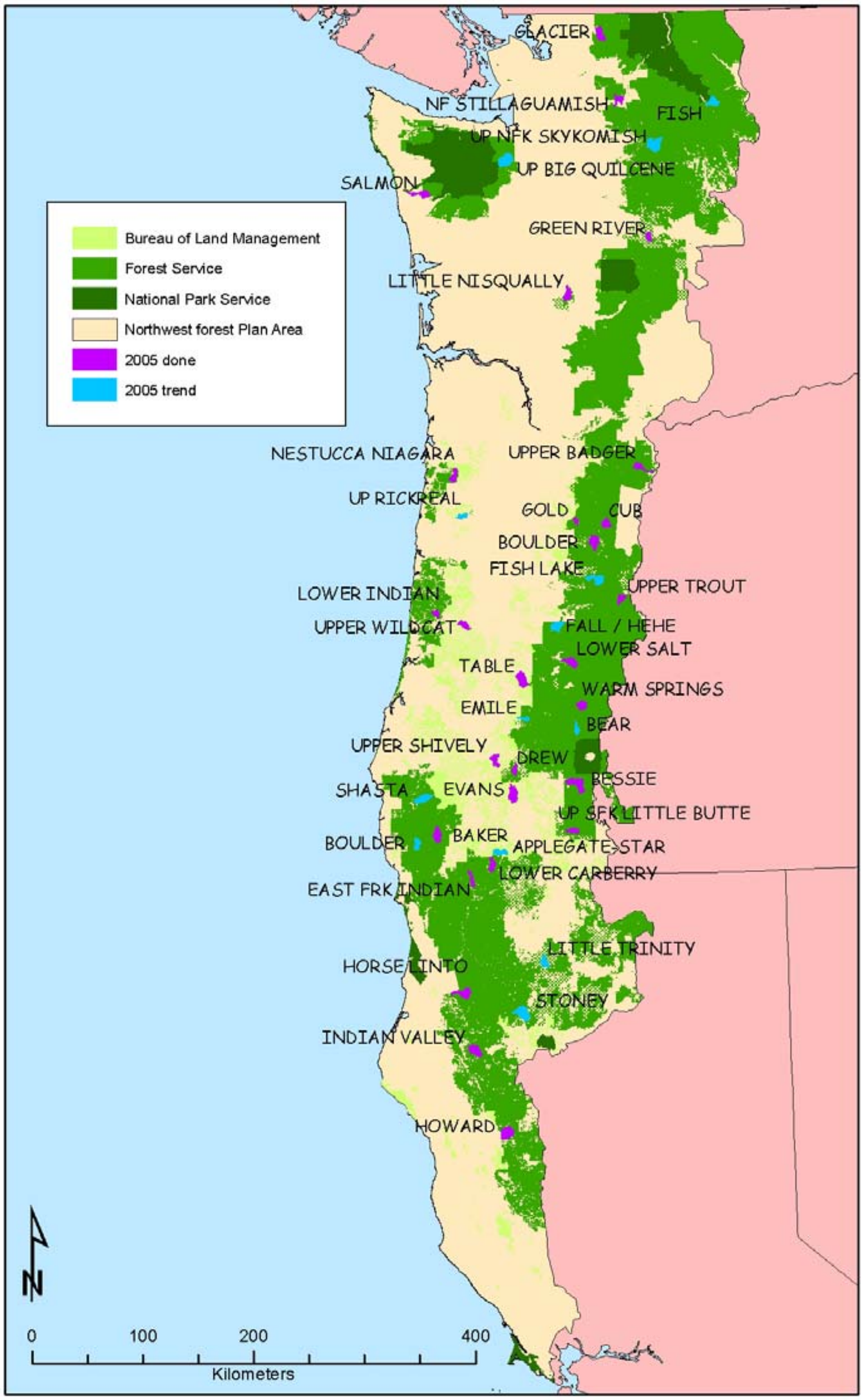

Figure 1 Map of the watersheds surveyed during 2005 summer field season. Watersheds coded in purple represent those in which initial surveys took place. Watersheds coded in blue indicate watersheds where a site was surveyed in 2004 to assess our quality control efforts, and then was resurveyed in 2005 for use in detecting watershed condition trends.

Table 1 Watersheds surveyed in 2005 as original surveys along with the number of sites surveyed in each watershed.

State	Province	Local Unit	6th Field HUC	6th Field HUC Name	Creek Code	County	Number of sites
CA	Klamath Siskiyou	Klamath NF	180102090203	East Fork Indian Creek	CAEIN	Siskiyou	6
CA	Klamath Siskiyou	Mendocino NF	180101040106	Howard Creek	CAHOW	Mendocino	6
CA	Klamath Siskiyou	Shasta - Trinity NF	180102120204	Indian Valley Creek	CAINV	Trinity	7
CA	Klamath Siskiyou	Six Rivers NF	180102111203	Horse Linto Creek	CALIN	Humboldt	6
OR	Coast Range	Eugene BLM	171002060301	Upper Wildcat Creek	ORWLD	Lane	8
OR	Coast Range	Siuslaw NF	171002030204	Nestucca River/Niagara Creek	ORNIA	Tillamook	6
OR	Coast Range	Siuslaw NF	171002060602	Lower Indian Creek	ORLIN	Lane	8
OR	High Cascades North	Deschutes NF	170703010803	Upper Trout Creek	ORUTR	Deschutes	8
OR	High Cascades North	Mt Hood NF	170703060901	Upper Badger Creek	ORBAD	Hood River	10
OR	High Cascades South	Rogue River NF	171003070203	Bessie Creek	ORBES	Klamath	7
OR	High Cascades South	Rogue River NF	171003070803	Upper South Fork Little Butte Creek	ORSBT	Jackson	7
OR	Klamath Siskiyou	Medford BLM	171003080304	Evans Creek	OREVN	Jackson	7
OR	Klamath Siskiyou	Rogue River NF	171003090107	Lower Carberry	ORLCB	Jackson	8
OR	Klamath Siskiyou	Roseburg BLM	171003020506	Upper Shively Oshea	OROSH	Douglas	5
OR	Klamath Siskiyou	Siskiyou NF	171003110604	Baker Creek	ORBAK	Josephine	4
OR	Western Cascades	Eugene BLM	170900020201	Table Mountain	ORTBL	Lane	7
OR	Western Cascades	Mt Hood NF	170900110201	Cub Creek	ORCUB	Marion	9
OR	Western Cascades	Umpqua NF	171003010301	Warm Springs	ORWRM	Douglas	5
OR	Western Cascades	Umpqua NF	171003020403	Drew Creek	ORDRE	Douglas	9
OR	Western Cascades	Willamette NF	170900010303	Lower Salt Creek	ORLST	Lane	8
OR	Western Cascades	Willamette NF	170900050107	Boulder Creek	ORBLD	Linn	8
OR	Western Cascades	Willamette NF	170900050503	Gold Creek	ORGOL	Marion	7
WA	High Cascades North	Mt Baker – Snoqualmie NF	171100130101	Green River Headwaters	WAGRN	King	6
WA	Northern Cascades West	Mt Baker – Snoqualmie NF	171100040104	Glacier Creek	WAGLA	Whatcom	9
WA	Northern Cascades West	Mt Baker – Snoqualmie NF	171100080102	North Fork Stillaguamish River at Squire Creek	WASQR	Snohomish	6
WA	Olympic	Olympic NP	171001020207	Salmon River	WASLM	Jefferson	6
WA	Western Cascades	Gifford Pinchot NF	171100150110	Little Nisqually River	WANIS	Lewis	8

Table 2 Watersheds surveyed in 2005 as trend surveys along with the number of sites surveyed in each watershed.

State	Province	Local Unit	6th Field HUC	6th Field HUC Name	Creek Code	County	Number of sites
CA	Klamath Siskiyou	Shasta/Trinity NF	180102110103	Little Trinity River	CATRN	Trinity	1
CA	Klamath Siskiyou	Shasta/Trinity NF	180102110404	Stoney Creek	CASTN	Trinity	1
OR	Coast Range	Salem BLM	170900070201	Upper Rickreall Creek	ORURK	Polk	1
OR	Klamath Siskiyou	Medford BLM	171003090203	Applegate River/Star Gulch	ORSTR	Jackson	2
OR	Klamath Siskiyou	Siskiyou NF	171003100602	Shasta Costa Creek	ORSHA	Curry	1
OR	Klamath Siskiyou	Siskiyou NF	171003120106	Boulder Creek	ORBDR	Curry	2
OR	Western Cascades	Umpqua NF	171003010402	Bear Creek	ORBRC	Douglas	2
OR	Western Cascades	Umpqua NF	171003011104	Emile Creek	OREML	Douglas	2
OR	Western Cascades	Willamette NF	170900010902	Fall Creek/Hehe Creek	ORHHE	Lane	1
OR	Western Cascades	Willamette NF	170900040102	Fish Lake Creek	ORFLK	Linn	2
WA	Northern Cascades East	Wenatchee NF	170200090202	Fish Creek	WAFSH	Chelan	2
WA	Northern Cascades West	Mt Baker/Snoqualmie NF	171100090201	Upper North Fork Skykomish River	WASKY	Snohomish	2
WA	Olympic	Olympic NP	171100180301	Upper Big Quilcene River	WAQUL	Jefferson	1