

DECLARATION OF

MICHAEL D. PURSER

3322 OAKES AVENUE, EVERETT, WA

I, MICHAEL D. PURSER, state as follows:

1. I am a consulting watershed scientist with education and experience in soil science, geomorphology, hydrology, water quality, forest management and salmonid ecology. I am also employed by the Snohomish County Department of Public Works, Everett, WA, as a principal salmonid habitat specialist. A true and correct copy of my curriculum vitae is attached hereto as Exhibit A.
2. I received a Bachelors of Science from Humboldt State University, Humboldt, CA, in Natural Resource Planning and Interpretation (Soil Science emphasis) in 1983. I received a Masters in Science from University of Washington, Seattle, WA, in Forest Hydrology in 1988. My thesis was entitled, "Effect of clearcut logging and high-lead yarding on spatial distribution and variability of infiltration capacities on a forest hillslope."
3. Since 1980 my education and experience has been in the fields of forestland soil science and hydrology, Quaternary stratigraphy (sources and processes of surficial geological deposits), erosion and sedimentation, fluvial geomorphology (the form and function of stream channels), and the effects of land management on physical and biological watershed processes. I am published in the peer-reviewed literature for research in forest hydrology, sedimentation of spawnable gravel, and Quaternary loess stratigraphy and soil formation.

4. My current professional work (1997- present) involves collecting and analyzing measured data, and developing models to evaluate current and future watershed conditions in support of salmon conservation planning for Endangered Species Act-listed chinook salmon and bull trout. I also use quantitative data collected to develop salmonid habitat restoration feasibility proposals. Further, I provide contract services on the following issues: effects of forest management operations on water quantity and quality; sediment delivery and cumulative effects of proposed conservation plans; and local land use planning proposals.
5. My past work has included: soil mapping; field-checking and boundary adjustments of USDA-Forest Service Soil Resource Inventory maps, field data collection and laboratory analysis of soil physical and chemical properties; analysis of soil properties in support of ecological assessment; field data collection of stream channel and floodplain characteristics; quantitative evaluation of timber sale proposals, including proposals for salvage; and the review of Decision Notices, Decision Memos, Records of Decision, Environmental Assessments and Environmental Impact Statements regarding timber sales and forest management plans.
6. From 1991 - 1997 I was employed as a Forest Hydrologist/Watershed Management Specialist for the Confederated Tribes of the Umatilla Indian Reservation (CTUIR). My projects included: collaborative development of fish habitat management plan for 250,000 acre watershed using USDA-Forest Service-developed quantitative performance measures; field review and analysis of proposed forest management activities; preparation and implementation of wetland and nonpoint sources of water

pollution plans; provision of technical and policy recommendations to tribal government committees and elected officials.

7. During my tenure as a Research Technologist in the Agronomy and Soils Department at Washington State University from 1987 through 1991, I collaboratively participated in research on Quaternary stratigraphy, soil formation, and the effects of timber harvest operations on soil properties. Prior to 1987 I worked as a Water Quality Consultant for Jefferson County Conservation District in Port Townsend, WA, as a professional soil scientist for the USDA-Forest Service, and as senior soil technician in university and commercial soil laboratories.
8. The opinions I state below are based on my personal knowledge gained through my review of the materials described below and my professional experience and training.
9. In the matter of the proposed “Limited Timber Harvest Categorical Exclusion (CE)” I have reviewed and analyzed: 1) information found at the following web site: <http://www.fs.fed.us/emc/lth/>, including instructions for the data requests, sample forms, etc.; 2) the data presented as results in spreadsheets found at the same web site, with the following direct links: <http://www.fs.fed.us/emc/lth/data1.xls> (hereinafter referred to as “data1.xls”) and <http://www.fs.fed.us/emc/lth/data2.xls> (hereinafter referred to as “data2.xls”); 3) “REQUEST FOR CORRECTION OF INFORMATION CONTAINED IN THE INITIAL DATA SET FOR TIMBER HARVEST EFFECTS MONITORING submitted to Quality of Information Officer and Dave Sire, both USDA-Forest Service by John Muir Project, Sierra Club, and Heartwood dated March 10, 2003; 4) USDA-Forest Service, Washington Office letter to Mr. Rene Voss from Frederick Norbury, file code 1300/1900-1 dated July 29, 2003 (hereinafter referred to

as “Washington Office letter dated 7/29/03”), in response to 3) above; 5) “Supplemental Guidelines for the Quality of REGULATORY Information Disseminated by USDA Agencies and Offices,” (hereinafter referred to as “Supplemental Guidelines”; 6) “Guidelines for Ensuring and Maximizing the Quality, Objectivity, Utility, and Integrity of Information Disseminated by Federal Agencies; Notice; Republication” published in the Federal Register Friday, February 22, 2002; and 7) “Methodology for Project Data Collection and Results of Review, Limited Timber Harvest Categorical Exclusions” (hereinafter referred to as “Methodology”).

10. I will attempt to provide an analysis of the soil information, and the information referred to above, used by the Forest Service to support a finding of non-significance for the proposed “Limited Timber Harvest Categorical Exclusion (CE).” This analysis will discuss 1) randomness of selection in accordance with “Instructions for Timber Harvest Effects Monitoring,” 2) the reliability and reproducibility of the “methodology” used; and 3) the Forest Service’s conclusion of “non-significance.”

11. Random Selection of Harvest Projects

“Instructions for Timber Harvest Effects Monitoring” states that monitoring can be performed on any *randomly selected* (emphasis added) timber harvest project and many units responded to this instruction. Units pulled names of timber harvest projects from hats, used random number generators, and other likely random methods. Other units had but one or two projects which met the other criteria. Many units, however, seem to have willfully not followed instructions for one reason or another (see Exhibit B, “how projects were selected” from data1.xls). This lends valuable insight into the process used to collect and analyze the information found in data1.xls and data2.xls. Some units chose typical or representative projects which may be fine, but it was not

what was requested. For some Forests, the Supervisor or Planning staff chose the projects, ostensibly using the other criteria, but introducing an unknown bias. Ease of access and closeness to town or Ranger Station were also given as the method of selection. Other selections reveal the need to minimize effort expended on monitoring (one day), which seems inconsistent with the Washington Office-level importance given this issue, but may reflect the feeling on the Forest or District regards this Washington Office program and directive. Further, quite a few had Environmental Assessments prepared, a luxury the proposed Categorical Exclusion would prevent. Finally, a few are more disturbing, basing their selection on the fact that they had previously been prepared and “held up for two years from treatment because of the Heartwood decision” or “The original salvage project was under contract to be harvested in 1999 when it had to be rescinded. The project was in response to a wind event that blew over a number of trees and the goal was to suppress the risk of spruce bark beetle moving into live trees. The NEPA analysis was complete and the timber sold approximately 1 year 5 months after the original decision. The project is ongoing currently and spruce bark beetle have begun to move into live Engelmann spruce trees inducing additional mortality. This was a relatively simple project that due to the recision (sic)and NEPA process was further delayed. Further management and tree removal will be necessary in an effort to suppress the current spruce bark beetle population. Monitoring techniques consisted of observations during site visits and timber sale administration.” All in all, the results portrayed in data1.xls are from a population that is neither random nor typical nor representative and are surely biased. Projects close to town or the Ranger Station are likely to be better implemented, and

more frequently visited and monitored than projects which were unavailable because of snow.

12. **Reliability and Reproducibility¹ of the Techniques Used**

The techniques referred to in the data submittal form and coded in data1.xls (observation, measurement, etc.) are not methods per se. We are not informed as to what was being observed or measured. There was not found any statement of specific procedures used or references to standard methods as may be found in Methods of Soil Analysis or other soil analysis reference. The information is therefore unreliable and irreproducible. As a qualified member of the public I would be unable to reproduce any of the information. References are made to ground cover and percent of area in roads and other disturbed areas for two of the “did not meet standards” projects, but no methodology as to how it was done were presented, no assumptions explained, and no quantitative data was presented which was gathered by a known method. This means that the data is not “capable of being substantially reproduced” nor is it transparent. The Supplemental Guidelines state that the agencies and offices will ensure transparency of the analysis by providing transparent documentation of data sources, methodology, assumptions, limitations, uncertainty, computations, and constraints. There is no such documentation. The technique of observation and expert opinion does not “ensure transparency of the analysis.”

¹ “Reproducibility” means that the information is capable of being substantially reproduced, subject to an acceptable degree of imprecision. For information judged to have more (less) important impacts, the degree of imprecision that is tolerated is reduced (increased). If agencies apply the reproducibility test to specific types of original or supporting data, the associated guidelines shall provide relevant definitions of reproducibility (e.g., standards for replication of laboratory data). With respect to analytic results, “capable of being substantially reproduced” means that independent analysis of the original or supporting data using identical methods would generate similar analytic results, subject to an acceptable degree of imprecision or error. OMB Terms (from Feb. 22, 2002 Fed. Register Vol. 67, No. 36, p. 8460)

13. Though one might naturally be suspect of subjective information masquerading as data collected by the (largely) unqualified (see 14 below) for a National Forest system program to rid the agency of monitoring needs and NEPA analyses, the Washington Office letter dated 7/29/03 assures us that the information came from expert professionals using expert opinion based not only on observation, but local, on-the-ground knowledge, degrees in their specialty, and years of experience. Unfortunately, this is unknown in some cases or known not to be true in many. A list of staff and specialties is presented in data1.xls, but we do not know of their experience, how local they are or whether or not they have a degree in soil science. They may be temporary staff called on to substitute for a permanent employee such as I once was during a timber sale interdisciplinary team meeting. They may be right out of school or recently transferred from across the country with little or no local knowledge or experience at all.
14. Only 56 of the 154 projects were monitored by a “soil scientist” at all (two of these were phone interviews). Of the 11 projects measured for compliance with soil standards, nine were measured by soil scientists and two of the nine did not meet standards. This means that when soil standards were measured by a soil scientist 22% failed to meet predicted conditions. This cannot be seen as the basis for Categorically Excluding these types of projects from monitoring and environmental review. Worse yet, of the 143 projects where observation, no method, or a blank space was the technique (see data1.xls), only 47 were reviewed by soil scientists, less than one-third. Only two of these projects were deemed to not meet standards. If the population were truly random, it would be near impossible to select nine projects where two did not

meet standards from a population of 154 where four did not meet standards. This confirms three biases: 1) bias against measuring soil properties to ascertain whether they met quantitative performance standards from Forest Plan; 2) bias against using professional soil scientists to perform the necessary monitoring, and 3) bias in the population selected for monitoring. The overarching bias, no bad news, is best exemplified by the project found on line 61 in data1.xls which was reviewed, but not measured, by a soil scientist who commented “some soil compaction/displacement visually evident within unit, but severity and extent could not be determined solely on observation” and then declared that it met standards, apparently the default assessment. In total, only 36% of projects used soil scientists for soil monitoring. This cannot be seen as monitoring by “journey-level specialists qualified to examine and draw conclusions” from their observation or other subjective method. The above described uncertainty is not to be found in the Methodology where one would expect it, as required according to the Supplemental Guidelines.

15. The Washington Office letter dated 7/29/03 states that the “use of reasonably reliable data and information (e.g., collected data such as from surveys, compiled information, and/or *expert opinion*)” (emphasis added) puts them in compliance with the Supplemental Guidelines referring to the section entitled “Objectivity of Regulatory Information.” Since the information presented is being used to support rulemaking which would remove the accountability of the agency to the public and involves a NEPA issue the information and monitoring techniques used to determine significance must be considered “influential².” As such, the rulemaking, the data, and the reliance

² “Influential”, when used in the phrase “influential scientific, financial, or statistical information”, means that the agency can reasonably determine that dissemination of the information will have or does have a clear and substantial

on the monitoring technique of “observation” violates the standards of “Influential Regulatory Information.”

16. The requirements for “Influential Regulatory Information” are higher. This information must “use the best science and supporting studies conducted in accordance with sound and objective scientific practices, including peer-reviewed science and studies where available.” It must “use data collected by accepted methods or best available methods.” These would include measurements of soil compaction by penetrometer or by bulk density methods to determine the area which has been compacted, for instance. Soil compaction has been found by researchers to persist in the subsoil for many decades and cannot be estimated by ground cover. A similar level of detail and scale is used commonly by foresters and engineers, why not soil scientists? Equipment and facilities for making these types of measurements are commonly available and have been observed in use on several Forests in the west. Finally, the requirements for Objectivity of Influential Regulatory Information make no allowance for the use of expert opinion.
17. The analysis does not “Clearly identify sources of uncertainty affecting data quality.” Nor does it provide an evaluation of data quality. These are required by the Supplemental Guidelines whether addressing the objectivity of regulatory information or of influential regulatory information. Clearly uncertainty is an issue as exemplified by the difference in percent of projects which did not meet standards when measured (22%) compared to the percent which did not meet standards when merely observed (<

impact on important public policies or important private sector decisions. Each agency is authorized to define “influential” in ways appropriate for it given the nature and multiplicity of issues for which the agency is responsible. OMB Terms (from Feb. 22, 2002 Fed. Register Vol. 67, No. 36, p. 8460)

1.5%). There are also clearly questions regarding data quality, but no effort was made to validate any of the data, even though the proposal uses and combines data from different sources, as mentioned in the Supplemental Guidelines.

18. **Can the Forest Service's conclusions of "non-significance" be inferred from the information (i.e., data1.xls and data2.xls) provided for soils?** The data presented for the projects which were monitored by measurement by a soil scientist are the only data with validity on this issue. These nine projects were predicted to be non-significant, that is they would meet standards for all monitorables and not add cumulatively to effects from projects with which they may interact in space and time. Two of these nine predictions were wrong. Therefore, albeit with a relatively small sample size, the rate of mis-prediction or significance is about 22%. The potential for an incorrect prediction that approaches 1 in 4 and that can result in damage to soil, forest, and water resources, cannot be seen as insignificant.
19. In relying on the subjective predictions based on unknown estimation methods for 143 of the projects, less than one-third of which were visited by a soil scientist, the Forest Service is introducing a high degree of uncertainty and risk into their decision. As explained above, these issues are not addressed in any of the materials reviewed. The risk, uncertainty, and miscalculation of effects (see data1.xls, lines 35, 36) is greatly magnified when one considers that the Forest Service is proposing to categorically exclude projects such as these from environmental assessment and review by the public forever. The 154 projects were just a sample of projects from about a three year period. One could assume (explicitly) that up to 1000 projects will be proposed over the next ten years (154 times 2 = total projects in three years times 3 equals 900+

projects). With average salvage projects running about 250 acres, that is about 250,000 acres of categorically excluded timber harvest over the next ten years. If predictions are missed on just 10% (less than one half rate of missed calls on projects measured by a soil scientist), then 25,000 acres, which may now meet standards, will be affected such that they do not. These effects will be in addition to the effects of projects for which environmental assessments and environmental impacts statements are required. This is significant and needs to be addressed through quantitative data collection using an explicit method and adaptive management to prevent detrimental soil effects to thousands of acres in the near future, not through categorical exclusion.

20. Finally, it is curious that the Forest Service included a project, line 91, that totals nearly a third of the total acreage of all 154 projects. This salvage sale on 9000 acres, as well as four others of 1000 acres or greater, severely skews the average size of salvage projects which is then used to justify the proposed acreage limitations for the Limited Timber Harvest Categorical Exclusion. They further try to justify the inflated average size of salvage projects by referring to the average size of the 306 projects categorically excluded by the Forest Service in 1998. In other words, their justification for the proposed acreage limitation is that it is about the average size of salvage projects categorically excluded and completed by the Forest Service in the year they were enjoined from doing it further. Were these five projects (about 3% of projects reviewed) removed from the population, the average salvage project would be less than 100 acres, not 255 as reported in Methodology. In fact, only 18 total projects, including the above referred to five projects, are greater than 250 acres (see data1.xls). It is clearly significant that these projects are included in the review by the Forest

Service. It is also clear that at least the 9000 acre project is an outlier relative to the other 153 projects and should not be considered in the average for this population. It is unclear why it is in the review.

21. **Conclusion**

Examination and analysis of materials referred to above and pertinent to the matter of the Limited Timber Harvest Categorical Exclusion rulemaking lead me to conclude that:

- 1) the population of “randomly selected” projects was anything but; a high level of projects (20%) had been through an environmental or biological assessment; projects were selected by many other means in addition to random; a range in project acres stretched from ¼ to 9000, well outside the range of even the proposed, biased acreage limitation;
- 2) the drastically different results of monitoring by “measurement” by qualified professional soil scientists, which yielded a significance rate of 22% and monitoring by “observation” by the largely unknown, which yielded the desired, non-significant rate of 1.5%, provide evidence that data quality is poor, reproducibility is low to nonexistent, and the monitoring effort overall was poorly planned and funded; further, the lack of explicit methods used, measurement units, quality control contributes to the irreproducibility of the “data” and makes the process completely opaque to other professionals, decision makers, and the public; worse yet it displays an ingrained bias against collection of data about soil resources, the public, and the process of environmental review; and

3) since there is both a high risk of making the wrong prediction as to whether a proposed project will meet Forest Plan standards, and potentially other standards as well, and a high risk of Responsible Officials agreeing with an earlier decision of non-significance even when faced with a highly significant rate of wrong predictions when monitored by measurement by professionals and which result in not meeting standards (see data1.xls), there is a justifiable need for more transparency, greater efforts at data collection and quality control, the explicit comparison of data with quantitative performance standards, and greater opportunities for the public to understand and contribute to potential projects, not less. The on-the-ground effects of projects which would be excluded from environmental review under the proposed Categorical Exclusion are significant in nature, affecting forest growth, ecosystem health, and conservation of critically-depressed populations of native fish. Further, they would be in addition to those incrementally accruing from nearby projects which, at least, are more explicit about the effects and make some effort at mitigation of those effects. The anachronistically large acreage limitation for salvage projects is seen as artificially inflated by the inclusion of outlier projects and is further “justified” by the reference to the average size of projects completed five years ago and without any other reference to other, resource-based, criteria.

Respectfully,

A handwritten signature in black ink that reads "Michael D. Purser". The signature is written in a cursive style and is positioned to the left of a vertical line.

Michael D. Purser
3322 Oakes Ave., #11
Everett, WA 98201

Exhibit A
Curriculum Vitae

NAME: Michael D. Purser

CURRENT POSITION: Consulting Watershed Scientist
Principal Habitat Specialist

ADDRESS: 3322 Oakes Ave. #11
Everett, WA 98201
(425) 339-6116, email Mdpurser@aol.com

EDUCATION: B.S. 1983 Natural Resource Planning and Interpretation (Soil Science emphasis)
Humboldt State University, Arcata, CA
M.S. 1988 Forest Resources (Hydrology)
Thesis title: "Effect of clearcut logging and high-lead yarding on spatial distribution and variability of infiltration capacities on a forest hillslope."
University of Washington, Seattle, WA

PROFESSIONAL EXPERIENCE:

July 1997-present Consulting Watershed/Water Quality Hydrologist

- ? Conducted research on overwinter sedimentation of chinook spawning redds in Critical Habitat for ESA-listed salmon and co-authored a peer-reviewed proceedings article;
- ? Prepared a literature review synthesis of the impacts of forest management operations on water quantity and quality;
- ? Prepared an analysis of sediment delivery, grazing management and cumulative effects of proposed Plum Creek Habitat Conservation Plan for ownership in Washington, Idaho, and Montana;
- ? Reviewed, analyzed and provided comments on the Sierra Nevada DEIS.
- ? Assisted citizen stakeholders resolve local land use planning issues;

Under contract to the Confederated Tribes of the Umatilla Indian Reservation (July 97-July 98):

- ? Co-facilitated the Umatilla TMDL Technical Committee;
- ? Prepared a technical draft On-Reservation Long-Term Range Management Plan; and
- ? Co-prepared a land management unit map with database and interpretation to assist in strategic planning, to identify restoration project priorities and needs, and to identify water quality and native plant community monitoring and evaluation projects.

July 1998 – present

Principal Habitat Specialist

Snohomish County Department of Public Works, Everett, WA.

- ? Led project which inventoried approximately 100 miles of wadable stream and approximately 70 miles of non-wadable stream; measured physical habitat conditions (i.e., pool size, wood diameter and length, percent surface fine sediments). Summarized and analyzed statistics of central tendency and variability; performed quality control on data collection (i.e., repeated random reaches with a different team). Wrote annual reports summarizing data relative to National Marine Fisheries Service Pathway and Indicators or locally developed quantitative performance criteria.
- ? Analyzed land cover and physical habitat data to evaluate salmon habitat conditions in the Stillaguamish River Basin. Addressed assumptions pertaining to historical conditions of, current conditions of and land use effects on salmon habitat.
- ? Performed field investigation and wrote the restoration, mitigation, and monitoring plan for restoration of 233 acres of leveed Snohomish River floodplain during and after breaching of the levee;
- ? Presented information on habitat conditions, chinook salmon population status, implications to landowners and communities of ESA listing of chinook salmon by NMFS to the Snohomish County Executive Task Force; local, state and federal staff; and citizen groups.
- ? Managed projects, budgets and staff for watershed and fish habitat .

April 1991-June 1997

Forest Hydrologist/Watershed Management Specialist

Confederated Tribes of the Umatilla Indian Reservation (CTUIR), Pendleton (Mission), OR.

- ? Co-authored Upper Grande Ronde River Anadromous Fish Habitat Protection, Restoration, and Monitoring Plan for management of salmon habitat on approximately one-quarter million acres of public land under the Endangered Species Act. Assisted in the development of Desired Future Conditions, and cumulative watershed effects analysis procedures to protect and restore water quality and watershed conditions on Umatilla Indian Reservation, National Forests and other lands.
- ? Reviewed, collected field data, analyzed, and prepared comments on other proposed federal activities which may degrade water quality and/or watershed conditions. These included primarily U.S. Forest Service timber sales and larger, programmatic activities such as PACFISH, ICBEMP.
- ? Co-facilitated Umatilla Total Maximum Daily Load (TMDL) Technical Committee. Chaired Temperature subcommittee and participated in Sediment and GIS subcommittees. Used instruments to monitor stream temperature and dissolved oxygen; collected samples for laboratory analysis of total suspended solids and bacteria. Gave presentation water quality status to Umatilla Basin Watershed Council.
- ? Project Leader and Editor/Co-author of CTUIR's Analysis of the Draft Environmental Impact Statement for the Columbia River System Operations Review, including summarizing and serving as the technical lead for two economic analyses of Columbia River operations and Tribal Trust Assets.
- ? Prepared Wetland Protection Plan, including development of the Wetland Policy Statement, under contract with the U.S. Environmental Protection Agency.
- ? Contributor to and reviewer of CTUIR's *Columbia River Salmon Policy*.

- ? Prepared and coordinated with tribal, local, state, and federal agencies and local watershed council in the implementation of Nonpoint Sources of Water Pollution Assessment and Management Program, Umatilla River Basin, under contract with U.S. Environmental Protection Agency.
- ? Contributor to and reviewer of Wy-Kan-Ush-Mi Wa-Kish-Wit (Spirit of the Salmon), The Columbia River Anadromous Fish Restoration Plan of the Nez Perce, Umatilla, Warm Springs, and Yakama Tribes.
- ? Provided technical and policy recommendations to Tribal Water Committee, Natural Resources Commission, Fish and Wildlife Committee, Cultural Resources Commission, General Council (electorate), and Board of Trustees (elected officials).
- ? Gave technical and policy presentations to Tribal members, the non-member public, local watershed councils, local government, and scientific meetings (e.g. Forest-Fish Conference, Calgary, Alberta, Canada, May 1996).
- ? Co-organized and –facilitated “Watershed and Stream Restoration Workshop” at 1993 American Fisheries Society National Meetings held in Portland, OR.
- ? Prepared successful grant and contract proposals for nonpoint sources of water pollution implementation, water quality standards development, Tribal Water Code administration and enforcement, and others in the amount of approximately \$1.3 million from 1993-6.
- ? Developed and managed water quality management program, including policies, projects, activities and budgets.

Oct. 1987-April 1991 Research Technologist

Department of Agronomy and Soils, Washington State University, Pullman, WA.

- ? Responsible for daily operation of soil genesis, morphology and classification laboratory. Performed chemical and physical analysis of soils, compiled and analyzed quantitative data, and wrote reports, including co-authorship of peer-reviewed journal article.
- ? Conducted research on soils, hydrology and Quaternary geology of Willowa Valley, Oregon.
- ? Conducted research on impact of feller-buncher logging on soil properties of forest soil derived from volcanic ash and glacial till.

July 1986-Oct. 1987 Water Quality Consultant

Jefferson County Conservation District, Port Townsend, WA.

- ? Collected and analyzed stream and bay water samples for bacterial pollution.
- ? Provided natural resource education and land management assistance to landowners in wetland-dominated lowlands of east Jefferson County.
- ? Member of interdisciplinary team which addressed accelerated erosion and mass wasting on private industrial forestland.
- ? Wrote forest practices section for 1987 Department of Ecology (DOE) Water Quality Guide.
- ? Wrote reports for District and DOE regarding domestic animal survey and nonpoint source pollution, recommendations for revegetation of previously ditched lowland riparian zones.
- ? Provided technical and policy recommendations to Board of Supervisors. Developed and prepared monthly newsletter of District activities.

Oct. 1984-June 1986 Graduate Research Assistant

Univ. of Washington, Seattle, WA.

- ? Conducted research on the impacts of forestry on hillslope hydrology. Selected site, sampled, analyzed physical and hydrological properties of soil. Tested statistical significance of impact and used infiltration and storage-excess models to predict hazard of overland flow and erosion. Research served as basis for M.S. thesis and peer-reviewed journal article.
- ? Participated in interdisciplinary field study group focusing on the impacts of land management activities on earth surface processes.

July-Sept. 1985, March-Sept. 1984, June-Sept. 1983, June-Sept. 1982

Soil Scientist

USDA-Forest Service, Darrington, WA; Sonora, CA; Pacific Valley, CA; Hathaway Pines, CA

- ? Conducted a landslide survey of Canyon Creek, a tributary of the South Fork of the Stillaguamish River, WA.
- ? Conducted an Order 2 Soil Survey of two (2) 10,000 acre planning units in the Stanislaus and Tuolumne watersheds of the central Sierra Nevada Mountains.
- ? Participated in an Ecosystem Classification (USDA-FS Region 5) of coast redwood forest in the Los Padres National Forest south of Big Sur, CA.
- ? Conducted a range inventory and analysis and Order 2 Soil Survey of a range allotment near Bear Valley, CA (Stanislaus National Forest).
- ? Served as Assistant Project Soil Scientist on the Granite Burn Rehabilitation Project, Stanislaus National Forest, CA.
- ? Justified boundaries and mapping units of the Soil Resource Inventory for the Stanislaus National Forest.
- ? Performed literature review and field investigations of proposed soil series, Banderita, in the upper foothills of the central Sierra Nevada Mountains.

PROFESSIONAL ACTIVITIES AND AWARDS

Consultant, Jefferson County Conservation District, Port Townsend, WA, 1986-7.

Member, Soil Science Society of America 1984-1991.

Member, Northwest Forest Soils Council 1985-1992.

Member, Society of American Foresters 1987-1990.

Member, Washington Society of Professional Soil Scientists 1988-1991.

Member and Stream Habitat Committee Co-Chair, American Fisheries Society, Oregon Chapter, 1992-4.

Invited to join Sigma Xi, the Scientific Research Society, in 1994.

Eagle Award, recognition as a person of vision, CTUIR, 1996

Consultant, Bellevue and Everett, WA 1997-present

PRESENTATIONS, REPORTS AND PUBLICATIONS

Anderson, J.W., Beschta, R.L., Boehne, P.L., Bryson, D., Gill, R., McIntosh, B.A., Purser, M.D., Rhodes, J.J., Sedell, J.W., and Zakel, J., 1993. A comprehensive approach to restoring habitat conditions needed to protect threatened salmon species in a severely degraded river -- The Upper Grande Ronde River Anadromous Fish Habitat Protection, Restoration and Monitoring Plan. Riparian Management: Common Threads and Shared Interests, pp. 175-179, USFS Gen. Tech. Rept. RM-226, Fort Collins, Co.

Borchert, M., D. Segotta, and M.D. Purser 1988. Coast redwood ecological types of southern Monterey County, California. General Technical Report PSW-107. Berkeley, CA. Pacific Southwest Forest and Range Experiment Station, Forest Service, U.S. Dept. of Agriculture.

Busacca, A.J., K.T. Nelstead, E.V. McDonald, and M.D. Purser 1992. Correlation of Distal Tephra Layers in Loess in the Channeled Scabland and Palouse of Washington State. Quaternary Research 37, 281-303 (1992).

Frissell, C.F., G. Haas, M. Purser, and M. Scurlock, 2000. An Ecological Assessment of the Plum Creek Native Fish Habitat Conservation Plan. Final Report to Pacific Rivers Council, Eugene, OR.

Purser, M.D. 1983. Influence of soil properties on species composition on a coastal terrace, Patrick's Point, CA. B.S. Thesis. Humboldt State University.

Purser, M.D. 1988. Effects of clearcut logging with high-lead yarding on spatial distribution and variability of infiltration capacities on a forest hillslope. M.S. Thesis. University of Washington.

Purser, M.D. and E.V. McDonald 1988. Soil development on glaciofluvial outwash terraces, Wallowa Valley, Oregon. Poster presented at Soil Science Society of America national meetings, Nov. 27-Dec. 2, 1988. Anaheim, CA. Also Agronomy Abstracts, American Society of Agronomy, Madison, WI.

Purser, M.D. and E.V. McDonald 1989. Interpretation of late Quaternary stratigraphy near Wallowa Lake, Oregon by analysis of soil properties. Presented at the joint meeting of Rocky Mountain and Cordilleran sections, Geological Society of America, May 11, 1989. Spokane, WA. Also GSA Abstracts with Program, Vol. 21, No. 5, March 1989.

Purser, M.D. and T.W. Cundy, 1992. Changes in Soil Physical Properties Due to Cable Yarding and their Hydrologic Implications. Western Journal of Applied Forestry, Vol. 7, No. 2, April, 1992.

Rhodes, J.J. and M.D. Purser, 1998. Thinning for Increased Water Yield in the Sierra Nevada: Free Lunch or Pie in the Sky? Report to the Pacific Rivers Council, Albany, CA. August 1998.

Rhodes, J.J. and M.D. Purser 1998. Overwinter Sedimentation of Clean Gravels in Simulated Redds in the Upper Grande Ronde River and Nearby Streams in Northeastern Oregon, USA:

Implications for the Survival of Threatened Spring Chinook Salmon. Pages 403-412 *in* M.K. Brewin and D.M.A. Monita, tech. Coords. Forest-fish conference: land management practices affecting aquatic ecosystems. Proc. Forest-Fish Conf., May 1-4, 1996, Calgary, Alberta. Nat. Resour. Can., Can. For., Serv., North For. Cent., Edmonton, Alberta. Inf. Rep NOR-X-356.

Exhibit B
“how project was selected” (from data1.xls; all are direct quotes)

A fairly recent decision memo that was completed and fairly close to the Ranger Station

DM was selected because it was close to town with easy access for monitoring results

Selected by reason of proximity to existing, open road, travel time, and limited opportunity for ID Team involvement prior to snowfall

From a list of applicable projects, this project was easily accessed from open roads.

Other projects were under snow cover or behind closed gates

This project was easily accessed while other areas were under snow cover or behind seasonally closed gates

This project was originally a DM and rescinded due to the R8 Heartwood Case. An EA was prepared with the same finding of No Significant Impact. Project was chosen since it was most recent

Decision Memo had been prepared and was ready to be issued at about time of litigation of CE Authority. EA w/decision notice prepared

This sale was not randomly selected. This sale was selected because it was the only sawtimber-sale example, on the 2-district Headwaters Zone, that fell under a CE/Decision Memo within the last 5-10 years. It was the most appropriate sale example for this monitoring effort

This sale is one of two beetle treatment sale that were originally covered under a CE.

This sale was held up for two years from treatment because of the Heartwood decision. As a result hundreds of more acres of beetles have attacked (sic) surrounding NF and private lands. A landscape analysis has been completed on 8/1/01 with no appeals. Only now is harvest activities beginning on these two sale. The wood products have now major defects and loss values. Hundreds of more greens have since died and major effects to the forest have resulted in the delay of this management treatments

The DM was not randomly selected. Although this is a wildlife driven project using Cat 6, it is representative of opportunities to utilize a Cat 4 if one were available. It is the only project available that is close to a forest health purpose/objective and provides small products for personal use from a commodity context

Project was recent and met the criteria that the Forest uses to categorically exclude

The selection was made at the Forest Supervisor's office

Two Districts submitted three projects. The team visited the District with two projects in one day to minimize impacts on their time

This project was originally categorically excluded, then an EA and DN prepared due to the court's decision on the Heartwood litigation

Proximity to other monitoring projects, easy access

This project was selected on the basis of having been monitored previous to this monitoring effort. However, the previous monitoring was not as comprehensive as the questionnaire (sic), so supplemental field review was conducted to provide missing information, even though not required

Not randomly selected. This was the only sale we had available which had some monitoring and met the criteria in the W.O. 1950/2400 Aug. 3, 2001 letter. Unfortunately, this memo. did not come to our attention till October of 2001, which was too late to conduct a field review on a previously unreviewed sale. Therefore, this was our only option

The Wash Creek Salvage Sale was selected, because this sale was the Republic Ranger District most recent CE, and it was not do to the rescission bill. The area was easily accessible for all the specialists to review

Cispus HTR Thin was substituted for a randomly selected project because the randomly selected project was inaccessible due to an early snowfall. Cispus HTR Thin was chosen because of its close proximity to our other randomly selected project

Per Forest requirement in 1996, monitoring included Forest Plan implementation and sale admin monitoring. Search of files for monitored CE yielded this project

This project was selected by the Forest Planning Staff Officer from a list of small sales

Two projects were selected that were in relatively close proximity to allow efficient travel.

This project was selected because it represented a typical shortleaf pine thinning

Very few projects that meet the criteria needed exist on the forest. These two sites were selected because they could be visited by the ID Team in a single day

Most recent Category 4 project with a decision date prior to May 5, 1999

This sale was the last sale which was implemented under a DM

This proposed harvest area met the requirements for a 31.2 #4 categorical exclusion. There were no extra ordinary circumstances except steep slopes which any potential impacts to soils were mitigated by winter logging and use of winching trees off slopes greater than 35% slope. There were few issues raised by the public during scoping