

ATTACHMENT A

Resume of James C. Kelley, Ph.D.

James C. Kelley, Ph.D.

Ph.D., Aquatic Ecology, 1985, Michigan State University
Master of Science, Plant Ecology and Taxonomy, 1980, Michigan State University
Bachelor of Science, Botany, 1978, University of Vermont
Postdoctoral Research Associate, University of Minnesota-Duluth
Certified Wetland Specialist – Pierce County, Washington
Washington Department of Natural Resources Watershed Analysis Certified

Dr. Jim Kelley has 16 years of experience working as a professional wetland ecologist. Building on his education and research experience, which emphasized botany, aquatic ecology, and water quality, he has investigated aquatic, terrestrial, and stream riparian ecosystems to support project planning, natural resource impact assessment, permitting, and mitigation design.

Dr. Kelley has extensive experience in planning, permitting, and implementing wetland and terrestrial habitat mitigation and restoration plans for a variety of public and private sector projects. He routinely assists clients with technical and regulatory issues involving wetland resources. He conducts surveys to delineate wetlands and riparian areas, evaluates areas for rare plants, assesses wildlife habitat, determines project impacts to natural resources, completes Section 404 Clean Water Act permitting, and assists with National Environmental Policy Act compliance. Dr. Kelley has prepared biological assessments and coordinated Endangered Species Act compliance for a variety of terrestrial and aquatic plant and animal species. He also provides expert testimony on wetland and other ecological issues.

In addition to the above experience, Dr. Kelley has state-of-the-art training in the planning, design, implementation, and maintenance of constructed wetlands for water quality treatment, and is currently completing treatability studies that evaluate the ability of constructed wetland systems to remove excess metals from surface water. He also assists in designing wetland and biofiltration facilities for storm water treatment. He has developed and implemented wetland restoration plans as part of sediment remediation (including dredging, capping, and natural recovery) actions. He is experienced in conducting cost and feasibility analyses using interdisciplinary teams of engineers, biologists, and economists.

Roads and Highways

Hansard Avenue Infrastructure Improvements – City of Lebanon, OR

Dr. Kelley assisted with the permitting of road and utility improvements for the City of Lebanon. The project involved reconstruction and widening of U.S. Highway 34, extension and reconstruction of existing streets, and construction of a 1.7-mile beltway link. Portions of these improvements were to occur in wetlands. Parametrix wetland biologists completed a wetland delineation, a wetland impact analysis, and a wetland mitigation plan for the project. We coordinated with the Oregon Division of State Lands and the Corp of Engineers to obtain permit approval for the projects.

SR 509 East-West Corridor EIS Wetland Report – Washington State Department of Transportation, Tacoma, WA

As task manager, Dr. Kelley completed a wetland technical study and EIS section for a NEPA EIS addressing a proposed limited access road around the Port of Tacoma. The wetland report identified wetlands along the project corridor, documented the functional significance of the wetlands, and evaluated project impacts to wetlands. Dr. Kelley coordinated with the design team to minimize and mitigate for project impacts to wetlands. A conceptual wetland mitigation plan was prepared to assist with environmental review and permitting.

Wetland Delineation and Critical Areas Study – Snohomish County, WA

Parametrix is preparing a scope of work and cost estimate to delineate wetlands and prepare a Critical Area Study (CAS) for a road widening project located south of the City of Snohomish on the Lowell-Snohomish River Road.

Air Transportation

Master Plan Update: Natural Resource Mitigation – Port of Seattle, WA

Managed completion of the natural resource mitigation elements of the Port's Proposed Master Plan Update Development Actions at Seattle-Tacoma International Airport (this study evaluates construction of a third dependent runway). Work included planning and design for the relocation of about 2,000 linear feet of Miller and Des Moines creeks, and the design of approximately 30 acres of off-site wetland mitigation. In addition to mitigation design, Dr. Kelley led the permitting effort to obtain a Section 404 permit for filling wetlands and a Hydraulics Project Approval for work in streams. Reports completed for the project included mitigation design reports, project alternatives analyses, and permit documents.

Municipal Airport Wetland Studies – City of Colville, WA

A detailed study of wetlands on the 300-acre site of a proposed new airport was completed. The studies involved extensive coordination with the Corps of Engineers, Department of Ecology, and other resource agencies. Studies included evaluations of threatened and endangered species (Bald Eagle), economic and ecological evaluations of project alternatives, conceptual design and construction cost estimations for a wetland mitigation plan, preparation of a revised NEPA EA for the project, as well as coordination with state and federal agencies to gain permit approval. The City was granted permit approval by the Corps of Engineers and Fish and Wildlife Service for wetland and endangered species permits, respectively.

Aviation Support Facilities, Natural Resource Impacts and Mitigation Studies – Port of Seattle, WA

As task manager for natural resource issues, Dr. Kelley conducted technical studies evaluating wetland and stream environments in support of a NEPA/SEPA EIS for a proposed aircraft maintenance base. Following publication of the EIS, Dr. Kelley assisted with design of a stream restoration/relocation plan for Des Moines Creek. The plan focused on restoration of spawning and rearing habitat for salmonids. Dr. Kelley coordinated with Corps of Engineers and other state and federal agencies to obtain permit approval. The project would result in the filling of wetlands, and the relocation of about 3,000 feet of natural creek. An integrated approach to mitigation was taken where spill control facilities, storm water detention ponds, wetlands, and stream enhancements were designed to increase ecosystem functions for fish, waterfowl, and other wildlife.

Rail Transportation

Everett to Seattle Commuter Rail EIS and Mitigation Planning – Sound Transit, Seattle, WA

Dr. Kelley served as project manager and senior scientist investigating the potential impacts of adding commuter rail service to an existing freight rail line. The analysis evaluated the natural resource impacts of alternatives for new mainline tracks, new passing tracks, passenger stations, parking lots, and other required improvements. The proposed improvements could impact freshwater wetlands, endangered species habitats, streams, and freshwater wetlands. A natural resource report was prepared to document existing conditions and the potential project impacts on these resources. Coordination with Federal and State natural resource agencies was completed to further evaluate project impacts, potential permitting conditions, and mitigation requirements. Concurrent with analysis of natural resources, Dr. Kelley managed completion of water quality and hazardous material studies.

South/North Light Rail Corridor Draft Environmental Impact Statement – Portland Metro, Portland, OR

As senior technical advisor, Mr. Kelley is responsible for assuring the quality and timeliness of all deliverables associated with preparation of the draft EIS for biological resource issues. This study is being conducted to assess construction and operation impacts of a proposed 27-mile-long light rail transit project to biological resources in the Portland metropolitan area. Mr. Kelly is also involved in negotiations with resource agencies regarding Endangered Species Act and Clean Water Act Section 404 permitting.

Light Rail Transit Facilities, Natural Resource Impacts and Mitigation Studies – Portland, OR

Conducted ecological studies evaluating wetland and stream environments in support of a NEPA EIS for the proposed extension of Portland's Light Rail Transit System. As task manager, he coordinated natural resource studies and permitting efforts with the Corps of Engineers and other state and federal agencies staff. The project evaluated impacts resulting from improvements to an existing rail line, proposed stations, park-and-ride facilities, and road system improvements. A conceptual wetland and stream mitigation plan was prepared to compensate for wetland impacts and to restore degraded streams and wetlands near the project. All studies and analysis were completed according to Federal Transit Authority Standards.

Pacific Northwest Rail Corridor Plan and Environmental Impact Statement – Washington State Department of Transportation, OR, WA and BC

Conducted the environmental analysis for the rail plan between Eugene, Oregon and Vancouver, British Columbia. Identified environmental constraints and other issues that needed to be considered in the evaluation of options and rail alternatives for a higher speed rail program. Coordinated with several cities and counties to identify local programs and plans which needed to be considered in the development of the plan. During the development of the Environmental Impact Statement, Dr. Kelley worked on an interagency coordination plan and assisted WSDOT in implementing the coordination program with cities, counties, Ports and Regional Planning Organizations. He is also managing the evaluation and documentation of natural resource impacts and mitigation strategies in the preparation of the NEPA EIS.

LINK Light Rail EIS – Sound Transit, Seattle WA

Assisted with the natural resource studies. Developed on a very tight schedule, the EIS evaluates a new light rail system extending from north Seattle to Sea-Tac International Airport. Public and agency response to the Draft EIS generated over 3,600 separate comments, each of which must be addressed in the Final EIS.

Site Development

City of Myrtle Creek Golf Course Development, Myrtle Creek, OR

The City of Myrtle Creek has planned and constructed a new municipal golf course and incorporated reuse into the irrigation system. Dr. Kelley assisted with the wetland delineation of the project site, assisted in planning golf course features to minimize impacts to wetlands and streams, and planned conceptual mitigation for the site. The delineation and mitigation plans were coordinated with the Oregon Division of State Lands and the Corps of Engineers to obtain permit approval for the project.

Mission Ridge Biological Evaluation – Mission Ridge Mountain Corp., Wenatchee, WA

Dr. Kelley served as a senior biologist in support of a NEPA Environmental Assessment to address issues on threatened, endangered, sensitive, and management indicator species for a proposed ski area expansion located on Forest Service land. Parametrix biologists prepared a wildlife habitat map, using aerial photos to address the amount and type of habitats present. A plant survey determined the occurrence, location, and abundance of sensitive species on the site. Fish and wildlife studies evaluated on-site streams for salmonid habitat, and surveyed the site for spotted owls and other sensitive wildlife species.

Sensitive Areas Ordinance Review – Century Pacific L.P., Seattle, WA

Parametrix assisted a private development group with review of City of Kirkland's Sensitive Areas Ordinance and recommended changes to ordinance to the planning Commission.

Wetland Creation and Restoration – Simpson-Tacoma Kraft Mill, Tacoma, WA

As project manager and technical lead, Dr. Kelley developed a detailed wetland restoration plan for a 2.8-acre intertidal and estuarine wetland adjacent to the Puyallup River. This plan included documentation of wetland fill through aerial photographs, identification of design criteria for the restored wetland, preparation of construction and planting plans, developing a cost estimate for the project, and completing agency coordination. The restoration plan emphasized development of a tidal wetland providing waterfowl and fish habitat. Dr. Kelley monitored construction and planting of the saltmarsh and has monitored the project annually since construction.

Everett Homeport EIS – U.S. Navy, Everett, WA

Parametrix prepared environmental impact studies and supporting discipline reports for the dredging and disposal of over 1 million cubic yards of marine sediment and for construction of piers and wharfs for the homeporting of Navy vessels. Dr. Kelley evaluated proposed dredge disposal sites for the presence of wetlands, appropriate wetland buffers, and impacts to native vegetation and habitat. These studies were used to determine the feasibility of land disposal of dredge materials.

Simpson/Lowell Mill Site Wetland Study – Simpson Investment Company, Everett, WA

Identified wetlands on a 34-acre industrial site to support Corps of Engineers permitting requirements. In addition to delineations, Dr. Kelley used aerial photographs and historical maps to prepare a history of wetland formation and disturbances on the former mill site. He presented findings to the Corps of Engineers and designed conceptual mitigation plans for the relocation of about five acres of wetland.

Wetlands Study for Branch Campus Site Selection – University of Washington, Snohomish County, WA

As task manager, Dr. Kelley conducted field surveys of five alternative project sites for a proposed university campus. These sites, totaling approximately 750 acres, were surveyed to identify and delineate wetlands, document wetland functions, and meet Corps of Engineers and Snohomish County permit requirements. Dr. Kelley coordinated with resource agencies and prepared a technical report and EIS sections documenting wetlands, development impacts, and mitigation measures.

Cherry Point Wetland Assessment – Chevron, Whatcom County, WA

Managed an assessment of wetlands on 900 acres of undeveloped land (pasture and second-growth forest). The project included delineation and mapping of wetlands and coordination with Corps of Engineers. Wetlands throughout the site were farmed, which required careful assessment and documentation of soil and hydrologic conditions to verify as wetland. A report documented the delineations, wetland characteristics, and classification according to the DOE Four-Tier System. Completed a functional assessment of wetland values as a necessary precursor to determine potential mitigation for site development.

Wetlands Inventory – Fourth Corner Economic Development Council, Whatcom County, WA

Managed the completion of a wetland inventory on 5,000 acres of industrially zoned property. Wetlands were mapped using aerial photo interpretation and field studies. Field maps were transferred to a geographic information system (GIS) to evaluate methodology and potential errors. Comparisons between field delineation maps and air photo inventory maps were made. The report summarizing these findings and the GIS database will assist the County in making land use decisions on wetland protection and future land use development.

Lake Tapps County Park Wetland Report – Pierce County, WA

Project manager and technical lead for the survey of a 188-acre park site to identify wetlands and wildlife habitat, evaluate wetland functions, and determine federal, state, and county regulatory requirements. The study was required as part of the park's master development plan so that the wetlands and other sensitive areas in the park would be protected from proposed facility expansion.

Wetland Report – Chief Joseph State Park, WA

Conducted an analysis of a 298-acre proposed state park in eastern Washington to evaluate plant communities, wildlife and wildlife habitat, and identify wetlands on the site. The study was designed so that proposed park developments could be planned while meeting Corps of Engineers, county, and state permit requirements.

Wetland Studies – Benaroya Capital Company, Seattle, WA

Dr. Kelley assisted Benaroya Capital Company in evaluating wetland and stream conditions on several parcels of land in Bothell, Washington. The studies allowed Benaroya Capital to determine potential development footprints and the ultimate economic feasibility of development projects. Dr. Kelley delineated wetlands, reviewed regulatory requirements for protection/alteration of wetlands, streams, and associated buffers. He recommended development strategies to maximize potential development footprints and comply with local, state, and federal wetland requirements.

Sewage Treatment

Shoreline Habitat Enhancement Plan, West Point Sewage Treatment Plant Upgrade – Metro, Seattle, WA

As a member of a consultant team designing an 18-acre shoreline park and beach habitat, Dr. Kelley conducted studies of natural and artificial shorelines to identify plant communities and habitat features to be incorporated into the design of a park system within and adjacent to the West Point Treatment Plant. To assure the park would provide significant ecological functions, a detailed planting schedule using native plants and a long-term monitoring program was developed for the project. Park features also included conceptual and detailed wetland mitigation plans that were developed to meet the conditions of the Corps of Engineers' Section 404 permit. Dr. Kelley also assisted with cost estimating to evaluate project feasibility given Metro's fiscal constraints.

Wetland Permitting/Mitigation for Wastewater Treatment Facilities – LOTT Partnership, Thurston County, WA

Assisted Lacey, Olympia, Tumwater, and Thurston County (LOTT) with the permitting and mitigation of a 1.6-acre wetland fill on Port of Olympia property. The fill was required to implement the Port's Master Plan to construct a new sewage treatment plant outfall to Puget Sound.

Solid Waste Management

Wetland Evaluation Woodwaste Landfill – Simpson Timber Company, Shelton, WA

Conducted a field survey and regulatory assessment of wetlands on the site of a proposed woodwaste landfill. Probable impacts of landfill development to wetlands were determined and regulatory requirements including avoidance and mitigation were assessed.

Vegetation Evaluations – Solid Waste Transfer Stations for Various Clients

Conducted field surveys for vegetation and threatened and endangered plant species, made regulatory assessments, prepared reports and mitigation plans for several proposed solid waste transfer stations in King, Snohomish, Grays Harbor, and Klickitat counties. These studies evaluated vegetation, wetlands, and wildlife habitat on proposed transfer station sites, as well as reviewed regulatory requirements affecting site development.

Wetlands Study and Mitigation – Snohomish County Regional Landfill, Snohomish County, WA

Conducted a field survey of a 400-acre site to identify and delineate wetlands, document wetland functions, and meet Corps of Engineers and County permit requirements for the project. Dr. Kelley coordinated with resource agencies and prepared a report documenting wetlands, development impacts, and mitigation measures. He also provided testimony at public hearings. Dr. Kelley prepared a detailed wetland mitigation report that addressed the filling of on-site wetlands, and sought permit approval for the project. He assisted in the preparation of construction plans and contracts for the mitigation project, and he has completed monitoring reports documenting the success of the project.

Site Clean-up/Reclamation

Pinal Creek Superfund Site Feasibility – Wetland Treatment Studies, WA

Pinal Creek receives acid rock drainage from historic copper mines and contains high concentrations of manganese and other metals. Dr. Kelley is assisting chemical engineers and geochemists who are conducting laboratory and field experiments investigating the feasibility of using a passive wetland treatment system to treat runoff waters to water quality standards. To remove manganese, a variety of aerobic wetland treatment options are under evaluation. Laboratory studies indicate that complete removal of manganese is technically feasible. Bench- and pilot-scale studies are focusing on developing cost-effective techniques to implement wetland treatment options. These options include the integration of wetland treatment with chemical treatment technologies.

Middle Waterway NRDA Mitigation Design, Implementation, and Monitoring – Simpson Tacoma Kraft, Tacoma, WA

Dr. Kelley planned and designed a Natural Resources Damage Assessment (NRDA) riparian wetland mitigation project in the Middle Waterway for the Simpson Tacoma Kraft Mill. The project included negotiations with the NRDA trustees on sampling to assess the nature and extent of contaminated sediments, permitting, design, construction oversight, development of performance standards, and monitoring of the mitigation site. Dr. Kelley is responsible for monitoring the mitigation project, and preparing annual monitoring reports.

Strandley Environmental Services – Seattle City Light, Purdy, WA

Dr. Kelley assisted with scientific and engineering services for a Removal Action and restoration of the Strandley/Manning sites, which is a Superfund hazardous waste site adjacent to Burley Lagoon near Purdy, Washington. He assisted with wetland evaluations and plans for restoration of terrestrial and aquatic habitat.

Forest Management

Port Houghton Timber Sale EIS – Tongass National Forest, Chatham and Stikine Areas, AK

Served as Task Manager for Threatened and Endangered Plant Species, Floodplains, and Biodiversity Tasks for an NEPA EIS addressing a proposed timber sale on a 192,000-acre project area located in southeast Alaska. Dr. Kelley completed literature reviews and field surveys to identify unique habitats, determine the occurrences of unique and rare plant communities and species, identify wildlife habitat corridors, map wetlands, and recommend habitat conservation areas. He also completed GIS mapping and landscape level analysis of plant communities, and assessed changes in forest cover to wildlife and biodiversity conditions. He was responsible for preparation of resource reports describing the affected environments, project impacts, mitigation opportunities, and appropriate monitoring guidelines.

Wetland Delineation and Permitting – Port Blakely Tree Farms, WA

As project manager, Dr. Kelley supervised wetland studies on a 200 acre forest zoned as for industrial landuse. The project included a delineation and mapping of wetlands on the project site so areas of developable land could be determined. The wetland delineation was reviewed and approved by the U.S. Army Corps of Engineers. Completion of the study allows Port Blakely Tree Farms to accurately represent the development potential of the property, as affected by wetlands.

Regulatory Assistance

On-Call Wetland Services – City of Kirkland, WA

Served as Project Manager for delineation of wetlands, wetland impact analysis, and mitigation planning for City and private development projects affecting wetlands and stream resources. Parametrix provided on-call services to the City as needed, and identified wetlands and impacts to wetland function in several of the City's parks, proposed housing projects, and transportation improvements. Dr. Kelley has prepared and reviewed numerous wetland and stream restoration projects for several city and private development projects.

Wetland Inventories – Cities of Puyallup, Sumner, Redmond, WA

Served as Project Manager for completing three inventories of wetlands within the comprehensive planning area for the cities of Puyallup, Sumner, and Redmond, Washington. These inventories were partially funded by the Department of Ecology through a Coastal Zone Management grant. Project management and methodologies were required to meet Department of Ecology Standards. Inventory of the 15 to 30 square mile planning areas used aerial photo interpretation, ground verification, soil survey maps, and National Wetland Inventory maps. The inventories are used by planning departments and land owners to evaluate the impact of proposed wetland regulations on land development and to assist with site planning.

Wetland Inventory – City of Sumner, WA

Responsible as Project Manager for completing an inventory of wetlands within the 15 square mile Sumner Comprehensive Planning area. Wetlands were identified according to Washington Department of Ecology procedures. These included aerial photo interpretation, evaluation of soil and National Wetland Inventory maps, and 100% field verification. Wetlands were identified on aerial photos and mapped on a geographic information system (GIS). The inventory was designed to allow planning staff and development proponents to identify environmental issues in early planning stages, and to minimize project impacts to wetlands.

Sensitive Areas Ordinance – City of Redmond, WA

Managed a field inventory of regulated wetlands within a 28 square mile area. Dr. Kelley provided technical evaluations of proposed ordinance goals, performance standards, and implementation procedures. He also participated in the public involvement process.

Surface Water Management and Water Quality

Miller Creek Regional Detention Facility – King County, WA

Assisted Parametrix engineering staff with permitting issues associated with the development of a regional storm water detention pond that would periodically flood wetlands. Activities directed by Dr. Kelley included wetland delineation, wetland impact analysis, wetland mitigation design, and coordination with Corps of Engineers' staff for Section 404 permit approval. The studies showed that storm water detention would have minor impacts to existing wetland vegetation. A mitigation plan, including wetland creation, was designed to mitigate for fill of wetlands associated with construction of the control structure.

North Creek Regional Detention Facility – Snohomish County, WA

Managed environmental studies and permitting analysis on the site of a proposed regional storm water detention facility. The studies were conducted in support of SEPA analysis of project

impacts, and to support Section 404 Individual Permit, and HPA Permit applications. Specific studies included analysis of wetlands, fisheries and wildlife habitat, and the impact of storm water detention on these wetland functions. An important permitting strategy was to emphasize the degraded nature of the wetland and affected stream while identifying opportunities to enhance wetland and fisheries value through mitigation. These studies were coordinated with the engineering design team, County staff, and federal and state resource agencies. Dr. Kelley also presented deposition testimony to help settle property appraisal issues associated with property acquisition for the facilities.

Wetland Study – Swamp Creek Regional Detention Facility Design, Snohomish County, WA

As part of an on call drainage design contract, Dr. Kelley conducted an inventory of forest, bog, and emergent wetlands on a 70-acre site proposed for regional storm water detention. Dr. Kelley prepared a technical report that was included as an appendix to the County's environmental impact statement assessing the impact of storm water detention on wetland communities. The facility consists of an earth-filled dam and outlet structure designed for a 100-year storm event. Since wetland habitat impacts and fisheries were a major concern, Dr. Kelley completed an analysis of flooding on wetland plant communities. These studies showed that flooding due to storm water detention would not result in significant impacts to wetland plant communities or their habitat benefits.

Hydrologic Control of Nitrogen Cycling Processes (Post-Doctoral Research) – University of Minnesota

Conducted studies to examine how fluctuations in water levels and flooding of wetland communities (caused by beavers) affected wetland ecology and the nutrient status of riparian soils. The project included identification of wetlands from color infrared aerial photographs, studies of nutrients in stream runoff, beaver ponds, soil, and interstitial water. Successional changes in beaver-influenced riparian zones were also examined through aerial photographs and GIS mapping.

Effect of a Marsh on Water Quality (Dissertation Research) – Michigan State University

Designed and implemented a study examining the role of wetland plant communities in cycling nitrogen and phosphorus in a riverine marsh. The study included the identification of wetland plant communities from color infrared aerial photography, construction of hydrologic, nutrient, and sediment budgets for a wetland basin; evaluation of nutrient dynamics in emergent plant communities; and an analysis of wetland water quality. The response of wetland communities to periodic water level fluctuations was documented through field studies and photogrammetric analysis.

Utilities

Pipeline Expansion Wetland Studies – Pacific Gas Transmission, OR and WA

As project manager and technical lead, Dr. Kelley planned and supervised studies to identify, delineate, and document wetlands along a 400-mile natural gas pipeline through central Oregon and Washington. The study was conducted to support permit applications for the construction of a new parallel pipeline through an existing right-of-way. This study used false color infrared photography, true color aerial video of the pipeline corridor, and National Wetland Inventory maps to screen wetland from non-wetland areas for further detailed studies. Field studies included mapping and detailed documentation of soil, vegetation, and hydrologic conditions at all potential wetlands. In addition to the field studies, he assisted with permitting the project through the U.S. Corps of Engineers offices in Washington and Oregon, and State resource agencies.

Tansy Ragwort Biological Control – Seattle City Light, Darrington, WA

As part of an on-call services consultant contract with Seattle City Light Environmental Affairs, Dr. Kelley evaluated the feasibility of biological control of tansy ragwort, a noxious weed, in the

utility's powerline right-of-way near Darrington in Snohomish County, Washington. Two insect species that feed on ragwort were released in the study area between 1986 and 1988. Insect populations and ragwort densities were monitored over a five-year period to evaluate the effectiveness of the biological control program in maintaining tansy ragwort at low densities.

Combustion Turbine EIS – Seattle City Light, Seattle, WA

Seattle City Light selected Parametrix to prepare an Environmental Impact Statement on the siting and construction of a combustion turbine. Dr. Kelley examined and reported on wetland and vegetation impacts to five sites. He identified possible mitigation measures for wetlands and terrestrial habitat, including substantial stream and wetland enhancement at the Duwamish River site.

Novelty Hill Substation and Transmission Lines Hill Natural Resource Assessment – Puget Sound Power and Light Company, King County, WA

As part of an indefinite quantity contract with Puget Sound Power & Light, Parametrix conducted environmental studies in support of new facility and transmission line development in the Puget Sound region. Dr. Kelley assisted with Wetlands Delineation and Characterization, Wildlife Inventories, and a Fishery Habitat Characterization and Stream Channel Stability Assessment

Additional Qualifications

Postdoctoral Associate

University of Minnesota, Natural Resources Research Institute (1985-1987). Dr. Kelley conducted studies to examine how flooding and drainage of wetland and riparian ecosystems by beavers affect the nutrient status and chemistry of riparian soils. Successional changes in beaver-influenced riparian zones were also examined through aerial photograph interpretation and GIS mapping. Dr. Kelley was responsible for designing environmental sampling programs for vegetation, soil, and water, as well as conducting analytical analyses for a variety of chemical constituents.

Effect of a Marsh on Water Quality

(Dissertation Research) Designed and implemented a study examining the role of wetland plant communities in cycling nitrogen and phosphorus in a riverine marsh. The study included the construction of hydrologic, nutrient, and sediment budgets for a wetland basin; evaluation of nutrient dynamics in emergent plant communities; and an analysis of wetland water quality.

Wetland Design for Hazardous Waste/Mining Operations

Dr. Kelley received professional, state-of-the-art training in the planning, design, implementation, and maintenance of wetland systems to treat waste water derived from industrial or other mining facilities.

Presentations and Publications

- 1988 Naiman, R.J., C.A. Johnson, and J.C. Kelley. Alteration of North American streams by beaver. *BioScience* 38:753-762.
- 1985 Kelley, J.C., T.M. Burton, and W.R. Enslin. The effects of natural water level fluctuations on N and P cycling in a Great Lakes marsh. *Wetlands*. 4:159-175.
- 1995 Kelley, J.C. and K.A. Lakey. An evaluation of wetlands and wetland functions in Southeast Alaska. Society of Wetland Scientists, Northwest Chapter, Annual Meeting, June 1995. Spokane, Washington
- 1995 Reak, A. and J. C. Kelley. Monitoring an eelgrass (*Zostera marina* L.) mitigation project for biological function and transplant success. Society of Wetland Scientists, Northwest Chapter, Annual Meeting, June 1995. Spokane, Washington

- 1994 Lakey, K.A., J.C. Kelley, and K. Ford. Recovery of functions in farmed Puget Trough wetlands following abandonment. Society of Wetland Scientists annual meeting, May 1994. Portland, Oregon.
- 1987 Kelley, J.C., C.A. Johnson and R.J. Naiman. Effect of beaver (*Castor canadensis*) on plant nutrient availability in stream riparian zones. Ecological Society of America Annual Meeting, August 1987, Columbus, Ohio.
- 1986 Kelley, J.C. Litter decomposition and nutrient dynamics in a freshwater marsh. American Society of Limnology and Oceanography Annual Meeting, June 1986, Kingston, Rhode Island.
- 1985 Kelley, J.C., and T.M. Burton. Nitrogen flux in a freshwater marsh and the significance of emergent plant production. American Society of Limnology and Oceanography Annual Meeting, June 1985, Minneapolis, Minnesota.
- 1984 Kelley, J.C., T.M. Burton, and W.R. Enslin. The effects of natural water level fluctuations on N and P cycling in a Great Lakes marsh. Presented at the Society of Wetland Scientists Annual Meeting, May 1984, San Francisco, California.
- 1984 Kelley, J.C., and T.M. Burton. Patterns of nutrient cycling in emergent plant communities. Great Lakes Coastal Wetland Colloquium, Michigan State University, November 1984, East Lansing, Michigan.
- 1983 Kelley, J.C., and T.M. Burton. Plant mediated nitrogen and phosphorus movements in a freshwater marsh. Ecological Society of America Annual Meeting, August 1983, Grand Forks, North Dakota.
- 1982 Kelley, J.C., and T.M. Burton. Nutrient flux and the role of emergent macrophytes in a rivermouth marsh. Ecological Society of America Annual Meeting, August 1982, State College, Pennsylvania.