K. Walter

BEFORE THE POLLUTION CONTROL HEARINGS BOARD
STATE OF WASHINGTON

AIRPORT COMMUNITIES COALITION, Appellant, CITIZENS AGAINST SEA-TAC EXPANSION, Intervenor/Appellant, v. STATE OF WASHINGTON, DEPARTMENT OF ECOLOGY; and PORT OF SEATTLE, Respondents.	PCHB No. 01-160 DIRECT TESTIMONY OF KATIE WALTER SUBMITTED ON BEHALF OF THE DEPARTMENT OF ECOLOGY

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Katie Walter declares as follows:

I. Introduction

1. I am a senior principal wetland scientist and manager of the natural resources group at Shannon & Wilson, Inc. I have been employed at Shannon & Wilson, Inc. since October 1994. A copy of my resume is attached as Attachment A. In January 2001 Shannon & Wilson, Inc. contracted with the Department of Ecology (Ecology) to provide natural resources and mitigation plan review services associated with the Port of Seattle's (Port) proposed Third Runway and related Master Plan Update improvement projects. I am the Shannon & Wilson project manager for that contract and have completed review of the Port's Natural Resources Mitigation Plan (NRMP) and supporting documentation. I assisted Ecology staff in developing related permit conditions for the 401 Certification.

II. Port's NRMP

2. The NRMP provides for a 2:1 ratio (two acres of mitigation for every one acre of impact) of wetland mitigation credits and a no net loss of wetland functions.[1] The mitigation sites are designed to replace the suite of wetland functions impacted by the project. Although a subset of the wildlife habitat function (waterfowl habitat) will not be an in-basin target in this mitigation plan because of bird strike hazards, the NRMP shows that there will be an overall net gain in functions and values in this watershed.

3. Specifically, the in-basin mitigation proposes to:

- Restore and enhances riparian wetlands in Miller, Walker, and Des Moines Creeks;
- Restore and enhances salmon habitat;
- Enhance stream buffers;
- Eliminate existing land uses that are detrimental to adjacent wetlands and streams; and
- Protect water quality and stream hydrology.

[1] See tables in the Direct Testimony of Erik Stockdale.

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In addition, 65 acres of out-of-basin mitigation, located in Auburn, is proposed to replace wildlife habitat functions that cannot be mitigated for onsite.

III. Functional Assessment Adequacy

3. Completion of a functional assessment of wetlands is very important when potential wetland impacts are proposed. Functional assessment methods provide guidelines for measuring wetland functions to determine what wetland functions may be lost or adversely affected and, thus require mitigation. There is a large array of different procedures available to assess wetland functions, such as, Washington State Methods for Assessing Wetland Functions (WAFAM), Wetland Evaluation Technique (WET), Wetland and Buffer Functions Semi-quantitative Assessment Methodology (SAM), and Hydrogeomorphic Approach (HGM). Many of these functional assessment techniques are site specific, or designed to assess only a few wetland functions. However, there is no single wetland assessment procedure that is routinely used for wetland functional assessment in Washington State. Given the variability of the types and characteristics of wetlands, it is accepted to use best professional judgment to tailor an assessment method that takes into account wetland variability. It is inappropriate to apply a wetland assessment method without taking into consideration the natural environment and physical setting of the wetlands being assessed.

4. The methodology used by the Port's consultants provided an adequate means of assessing wetland functions. I have reviewed the wetland functional assessment methodology and conclusions provided by the Port's consultants, and concurred with those findings. The assessment used several functional assessment methodologies for guidance, including the Semi-Quantitative Assessment Method, Wetland Evaluation Technique, and Indicator Value Approaches.[2] Rather than rely solely on one assessment method, the Port's consultants

[2] The assessment method employed is described in Section 2.2.2 of the Wetland Functional Assessment and Impacts Analysis Master Plan Update Improvements Seattle-Tacoma International Airport, Parametrix, Inc., December 2000.

exercised their best professional judgment to tailor an assessment method to take into account the features of the wetlands at the project site.

5. A synoptic assessment of wetland acreage impacts by wetland function for all wetland functions that rated greater than low can be found in Attachment B to the Declaration of James C. Kelley, Ph.D, submitted by the Port in response to the ACC's Motion for Stay.[3] This table outlines the rating threshold for each wetland function assessed, and totals the acres of potential impact associated with each function. Because no single quantitative procedure for measuring wetland functions that will be impacted by the Port's project is available, it was appropriate for the Port's consultants to use their best professional judgement. The assessment method employed by the Port's consultants effectively assesses the wetlands in this project.

6. The ACC's witnesses had the opportunity to review the Port's assessment method and have not disagreed with the conclusions reached rather they assert that the Port should have utilized the WAFAM assessment method.[4] This methodology was developed by Ecology in late 1999. The first assessment methods (for depressional and riverine wetlands) were published in July 1999 and Ecology began providing training in the use of those methods in the fall of 1999, after the Port had completed its functional assessment. Even if use of the WAFAM had been required when it was published and the Port's consultants had taken the week long training offered by Ecology, the WAFAM would have had only limited applicability to the project. The majority of the wetlands affected by the project are slope wetlands, a type of wetland that cannot be assessed by the depressional and riverine methods available in the WAFAM. The depressional wetlands represent approximately 23 percent of the acreage of the wetlands affected by the project and less than half of the individual wetlands identified. It is not scientifically appropriate to use one method to assess wetland functions for a portion of the

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[3] Declaration of James C. Kelley, Ph.D. Pollution Control Hearings Board for the State of Washington, Airport Communities Coalition, V. Department of Ecology and The Port of Seattle. September, 2001

[4] Hruby, T. T. Granger, K. Brunner, S. Cooke, K. Dublanica, R. Gersib, L. Reinelt, K. Richter, D. Sheldon, E. Teachout, A. Wald, and F. Weinmann. July 1999. Methods for Assessing Wetland Functions Washington State Department of Ecology, Publication No. 99-115.

impact area and another method for the remainder. One problem with such an approach is that the results of the various assessment methods could not be compared to one another.

IV. Performance Standards

7. Performance Standards allow a reviewer to determine if the objectives of a compensatory wetland mitigation plan have been successfully fulfilled. Performance standards are an important aspect of wetland mitigation plans because they provide a measure of the effectiveness of the mitigation effort.

8. The United States Army Corps of Engineers (Corps) defines performance standards as "observable or measurable attributes that can be used to determine if a compensatory mitigation project meets its objectives."[5] In the publication, Compensating for Wetland Losses Under the Clean Water Act, the authors recognize that "regulators need to agree that either 1.) design standards constitute reasonable performance criteria, or 2.) detailed assessment of functions lost must be matched by detailed assessment of mitigation site performance . . . ."[6] The NRMP includes a set of design standards that constitute reasonable performance criteria. Those criteria are buttressed by an adaptive management strategy to ensure that the proposed mitigation sites perform as expected.

9. A review of over 300 Corps' permits issued nationwide indicated that the performance standards developed in the NRMP meet or exceed those listed for freshwater wetlands.[7] The following is a list of ranges for performance standards taken from the table included in the technical note contained in Appendix E of Compensating for Wetland Losses Under the Clean Water Act (WRP Technical Note WG-RS-3.3) and compared to related

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[5] Streever, B. WRP Technical Note WG-RS-3.3. Examples of performance standards for wetland creation and restoration in Section 404 permits and an approach to developing performance standards. January 1999 U.S. Army Engineer Research and Development Center, Vicksburg, MS. Contained in Appendix E National Research Council, 2001, Compensating for Wetland Losses Under the Clean Water Act, National Academy Press, Washington, D.C.

[6] *Id.*, at 104.

[7] *Id.*, Appendix E.

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standards in the NRMP. This Technical Note includes descriptions of various performance standards from Clean Water Act Section 404 permits issued by the Army Corps.

Performance Standard	Range from WRP Technical Note	Standard Required in NRMP
Plant Survival	50-80 percent	80 percent
Vegetative Cover Herbaceous Woody	 80-85 percent 60-75 percent	 50-80 % by year 5 80 % by year 10
Duration of monitoring	1-8 years, many have provision for extensions.	15 years, with a provision for extensions.
Use of Delineation	Several sites required redelineation.	Requires redelineation at years 5, 10, & 15.
Comparison to reference wetlands	Several sites required comparison to reference wetland.	No comparison provided, but NRMP proposes adaptive management strategy.
Occurrence of exotic plant species	Less than 5 –10%	Less than 10 percent
Presence of Biological Indices	A few sites required the presence of certain plants or animals.	No specific biological index requirements.

10. The performance standards in the NRMP meet or exceed the Corps' performance standards for plant survival, vegetative cover, duration of monitoring, use of delineation, and occurrence of exotic species. Several of the performance standards identified in the Technical Note required percent cover of hydrophytic (wetland) vegetation (facultative *i.e.*, equally likely to occur in wetland or non-wetland), or wetter, based on the regional indicator status as referenced in the National List of Plant Species that Occur in Wetlands developed by United States Fish and Wildlife Service.[8] Several of the performance standards cited in the study had provisions for staged vegetation percent cover requirements similar to those required in the NRMP.

11. Some sites listed in the Technical Note required the presence of biological indices, to ensure that species unique to the type of wetland being mitigated were present over time. It appeared this was limited to sites that were mitigating vernal pools, or salt marshes. For instance, one site was creating 27 acres of vernal pools in California, and required specific

[8] Revision of the National List of Plant Species That Occur in Wetlands Porter B. Reed, Jr. U.S. Fish and Wildlife Service, February, 1997.

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species typically found in the regions vernal pools. Although the NRMP does not provide for monitoring of any specific biologic index, the type of wetland impacts that will occur do not tend to impact a specific species and, therefore, do not warrant that type of monitoring. The NRMP does not require comparison to specific reference wetlands, however, researchers have found that in reference site selection "there is so much variation on a regional scale that there may never be a perfect match for a site to be restored."[9]

12. The more prescriptive the conditions are for the performance standard the less achievable the performance standard becomes, without regard to the overall success of the mitigation project. For instance, if a mitigation plan required three acres of standing water in a certain location on April 1 of every year it is likely that over the course of the monitoring period a dry period may be experienced. In that case, it is unlikely that the standard would be met due to its specificity, even though the wetland may be very successful overall.

13. The performance standards in the NRMP are sufficiently prescriptive to provide reasonable assurance but not so prescriptive so as to not be implementable. Moreover, the adaptive management strategy allows for changes to mitigation sites where necessary to ensure that the mitigation is successfully implemented.

V. Hydrologic monitoring.

14. Concern has been expressed regarding the effect the embankment will have on the hydrology of down slope wetlands. Ecology and the Corps spent a considerable amount of time addressing this issue.

15. The embankment is designed with a replacement drainage swale that will collect water that seeps through the embankment and emerges at the base of the embankment. This water will be routed to many flow dispersal points directing the water to the wetlands down slope of the embankment. The dispersal points are designed so that flow can be manipulated to change the amount of flow. In addition, dispersal points can be added as

[9] *Id.*, at 44.

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necessary based on post-construction monitoring. The hydrologic model developed by the Ports consultants shows that groundwater will continue to flow under the embankment, as it does now. That water will either get routed through the underdrain and into the replacement drainage swale or will recharge the groundwater that supports the down stream areas.

16. It is difficult if not impossible to quantify the hydroperiod[10] for the slope wetlands that drain to Miller Creek. The timing, depth and duration of the water seeping and flowing across the slope wetlands are dependent on rainfall patterns, which varies greatly from year to year. Thus, the hydroperiod for these wetlands vary from year to year, with no predictable pattern in a given year. The variability in hydroperiods is reflected in a study discussed in Compensating for Wetland Losses Under the Clean Water Act.[11] The authors found that hydrologic regimes in intermittently saturated freshwater wetlands vary not only seasonally by also year to year. Additionally, water levels might not meet wetland hydrological standards for several consecutive years even though the wetland could satisfy criteria over the long term. This "inter-annual variability" makes it difficult to separate normal variability from what could be attributable to effects from the construction of the embankment and wall. Therefore, relying solely on hydrologic data for determining wetland mitigation success would potentially not reflect reality.

19. The NRMP provides for hydrologic monitoring of the wetlands downslope of the proposed embankment. However, because of uncertainty in relying on the hydrologic monitoring data alone, additional data will be collected in the wetlands. These data points will include the species of plants present, the percent cover of those species, presence of hydric soil conditions (including soil color, soil texture, organic content, presence or absence of redoximorphic features (soil mottling etc.)), and the depth of these features within the soil

[10] Hydroperiod is defined as: the water regime in a wetland; the periodic or regular occurrence of flooding and/or saturated soil conditions; encompasses depth, frequency, duration, and seasonal pattern of inundation.

[11] National Research Council, 2001. Compensating for Wetland Losses Under the Clean Water Act, National Academy Press, Washington, D.C., at pp. 104-108.

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profile. The data points will be used to determine if wetland areas downslope of the embankment continue to experience wetland hydrology, whether the duration of soil saturation is sufficient to maintain the existing wetland plant communities and existing hydric soil conditions. In addition, through adaptive management, the amount of water the wetlands receive can be manipulated as discussed above.

20. The ACC suggests requiring the Port to match the pre-filling hydrologic patterns in the wetlands, after the project is constructed. This suggestion cannot be accommodated because it does not allow for any measurable performance standard to monitor the downslope wetlands. The hydrologic monitoring required in the 401 is appropriate and provides for a measurable standard.

VI. Compliance and Adaptive Management

21. Ecology recently completed a wetland mitigation evaluation study that examined the success of wetland mitigation projects completed as compensation for wetlands lost to development activities in Washington.[12] The study lists the top ten factors contributing to the success of mitigation projects:

a. Adequate source of hydrology

b. Same consultant involved from the very beginning of the project (from delineation of impacts to mitigation monitoring and maintenance)

c. Good site selection

d. Oversight and follow-up by regulatory agencies

e. Mitigation designer on-site during construction

f. Good mitigation design

g. Natural revegetation (native seed source present) or native hydroseed mix used

h. Maintenance conducted on site

i. Irrigation used for at least one growing season

[12] Washington State Wetland Mitigation Evaluation Study Phase 2: Evaluating Success, January 2002 Publication # 02-06-009 http://www.ecy.wa.gov/programs/sea/mit-study/

j. Hydrologic monitoring conducted prior to mitigation plan implementation

22. The NRMP presently provides for each of these factors and, where appropriate, also requires them during the construction and implementation phase of the project. In addition, the plan relies on adaptive management post-construction to ensure that corrective action will be taken if areas are identified that are not functioning as designed to fix the problem. Adaptive management recognizes that not all potential site deficiencies can be predicted in advance and, instead, provides for corrective action to be determined on a case-by-case basis to meet the needs of the site conditions and circumstances presented.

23. The use of adaptive management is bolstered by Ecology requiring the Port to fund three to five full-time Ecology employees for oversight during the construction and monitoring period. This will ensure that follow-up by agency staff is adequate, timely, and consistent, and that any contingency actions taken are also reviewed by Ecology staff. One of the leading causes of failure of wetland mitigation is the lack of maintenance after implementation of the site wetland. This concern is addressed by the long-term monitoring and maintenance requirements imposed on the Port. The Port is required to monitor this site for 15 years post construction. This is a full ten years longer than typical mitigation monitoring and more stringent than any other permitted project that I am aware of. The length of the monitoring period will allow for more monitoring and help ensure the success of the mitigation.

VII. Auburn Mitigation Site

24. The Auburn mitigation site provides 65 acres of out-of-basin mitigation and provides innumerable benefits to the proposed mitigation. The Auburn mitigation site will enhance degraded wetlands and upland farm fields to a high-quality diverse wetland ecosystem. This mitigation site is intended to mitigate wetland habitat functions (especially for avian species) and will restore or enhance existing emergent wetland and upland with diverse

forest, shrub, emergent, and open-water wetland habitat, and restore buffers areas. The general mitigation goals for the Auburn site are listed in the NRMP as follows:[13]

- Achieve an overall increase in wetland acreage and functional replacement at a mitigation ratio of at least 2:1.
- Mitigate lost habitat functions of the Master Plan Update improvements outside of the 10,000 foot aircraft operations safety radius of STIA to protect public safety and reduce wildlife hazards to aircraft.
- Create diverse wetland habitats (including forested, shrub, open water, and emergent) as well as upland forested habitat on a large site adjacent to existing habitat corridors along the Green River.
- Enhance wetland functions in the existing degraded wetlands, which are dominated by non-native species, by converting them to diverse, native forested, shrub, and emergent wetlands.
- Provide long-term protection for the mitigation site by providing a 100-foot forested buffer around the perimeter of the site.

The Auburn mitigation site provides meaningful mitigation for the project's wetlands impacts.

VIII. Buffer Plantings Are Appropriate

25. The Miller Creek buffer zone is scheduled to be planted with both shrubs and trees in all disturbed areas. Where areas are already naturally vegetated inter-plantings will occur as necessary. Appendix A and B of the NRMP show the planting plans for this area. The densities specified for all of the riparian, wetland, and upland zones are 280 trees per acre and 2100 shrubs per acre. This translates to planting shrubs on approximately 4.5 foot centers and trees on approximately 12 foot centers, resulting in a typical density found in most mitigation specifications.

26. Mitigation plants are generally planted based on their typical density at maturity, factoring in a percentage for mortality. The densities provided are typical for establishing a forested system. The ACC cites inaccurate plant density calculations and suggest that the mitigation plan does not provide for forested areas adjacent to Miller Creek. However, plan Sheet L-4 of Appendix A of the NRMP shows the planting plan for the Miller

[13] Natural Resource Mitigation Plan Master Plan Updates Improvements Seattle-Tacoma International Airport, Parametrix, Inc. November 2001, pages 7-1 through 7-5.

Creek Relocation area. The plan sheet shows a narrow low flow channel, approximately four to eight feet wide. Immediately adjacent to the low flow channel is the creek planting zone (a shrub planting area), which in turn is followed by a buffer zone (a shrub and tree planting area), and finally by the flood plain zones. It is unclear what plans the ACC's biologists refer to when they state that this area is only wide enough for one tree width. The planting plan provides a minimum of 60 feet of the buffer zone, in addition to the creek planting zone, which provides shrub and tree vegetation that over time will become forested.

27. The ACC suggests that the plant survival performance standards conflict. The NRMP provides phased survival rates, requiring 100 percent survival in the first year, with 80 percent survival by year three. This is typical, because most mitigation plans require that the landscaper warrant plant material and replace all dead plants the first year after installation, automatically providing the 100% first year survival. These requirements do not conflict, rather they provide survival rates found in many mitigation plans.

IX. Seepage Loss In The Relocation Area Of Miller Creek

28. The ACC raised concerns as to possible seepage loss from the stream to the peat soils of Vacca Farm in the Miller Creek relocation area. The proposed relocated channel base elevation is lower than the seasonal low water elevations measured in the monitoring wells listed in the NRMP Table 5-1-10. This means that even during low water periods the water table will be at or above the base elevation of the channel. Therefore seepage loss from the channel to the ground will not occur.

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X. Conclusion

29. The NRMP provides a complete description of the goals and objectives of each mitigation project. It provides detailed performance and monitoring standards. Through monitoring and adaptive management the Port proposes to modify the compensatory mitigation to ensure it achieves its goals. The NRMP reflects the use of best available science. In my opinion, based on our understanding of wetland science, this plan provides adequate mitigation for the impacts created by the proposed project.

30. Based on my experience in designing, implementing and monitoring wetland and buffer mitigation plans, and my understanding of the state of mitigation science, it is my opinion that the Port will adequately mitigate for the project's impacts to wetlands and aquatic resources and the mitigation will be successfully implemented.

I declare under penalty of perjury under the laws of the State of Washington that the foregoing is true and correct.

DATED this 7 day of March, 2002 at Seattle, Washington.

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PROFESSIONAL EXPERIENCE

Shannon & Wilson, Inc. Senior Principal Wetland Biologist/Botanist
October 1994 – present
Pac-Tech Engineering, Inc.; Wetland Specialist
June 1991 - October 1994
Woodward Clyde Consultants, Quality control of Exxon-Valdez oil spill data
Temporary employment, 1991
City of Seattle Engineering Dept., Street Tree Inventory Project
July – October 1990

PROFESSIONAL SUMMARY

Katie Walter is a senior biologist and botanist with over 11 years of experience performing natural resource inventories, wetland delineations, mitigation plans, and permitting for large complex multi-jurisdictional projects. She has provided extensive support to municipal and government clients working directly with several agencies. Katie has developed mitigation plans, performed botanical surveys, conducted function and values assessments, developed conceptual and final mitigation plans, performed regulatory review, managed permitting, and provided construction oversight for numerous projects throughout King and Pierce Counties. In addition, her technical expertise in mitigation design and applied ecological concepts has helped clients plan for expected permit requirements, implement permittable project designs, and meet project schedules.

RELEVANT EXPERIENCE

SLF Management, Wetland Mitigation, Bothell, Washington. Katie was wetland biologist for a mitigation project for the Sarkowsky site in Bothell. The Nationwide permit was issued by the Corps of Engineers, and Ecology issued a 401 water quality certification. Construction of the compensatory mitigation was successfully completed in 2000.

City of Fife, Wetlands Investigation, Fife, Washington. Katie served as wetland biologist for the Union Pacific Railroad siding extension in Fife. She coordinated wetland permits required from City of Fife and the Corps of Engineers, Ecology and Washington Department of Fish and Wildlife. She developed a detailed mitigation plan to compensate for the proposed impacts and obtained CWA Section 404 and 401 approvals.

Federal Way School District, Wetland Delineation and Mitigation, Federal Way, Washington. Katie was wetland scientist responsible for delineation and a mitigation plan for Rainier View Elementary School for FWSD. The project was under a very tight time frame and had significant mitigation restrictions. The mitigation plan proposed creating a three-celled emergent wetland. The project included several elements that enabled teachers to use the mitigated wetland for educational purposes. Katie was responsible for construction monitoring of the mitigation area, and oversaw the monitoring of the constructed wetland upon completion. The created wetland appears to be functioning as required.

Wetland Mitigation for Single-Family Subdivision, Pierce County, Washington. Katie served as wetland scientist for a mitigation project on a 24-lot single-family subdivision in Pierce County. The plan was accepted by Pierce County and implemented in the fall of 1993. Storm water first passes through a vegetated storm pond for biofiltration, and then into the wetland system. A unique feature of this mitigation was that one protocol for success was the presence of Pacific Chorus Frogs utilizing the wetland at the end of the monitoring period. At the last monitoring, the Chorus Frogs were audible in and around the wetland.

Wetland Mitigation Study for Large Lot Subdivision, Gig Harbor, Washington. Katie was wetland scientist for a mitigation study and respective report for large lot subdivision adjacent to Wollochet Drive in Gig Harbor. A portion of the mitigation was implemented for a 100-year compensation pond, which was vegetated as an emergent wetland. Monitoring of the area was completed in the fall of 1994. This area was highly successful as an emergent marsh and has more than 100 percent cover with the planted species. Several habitat features were placed in the existing wetland and pond as enhancement, and achieved success. For instance, a pair of Canadian geese as their nest site utilized one nesting raft for two consecutive years.

City of Algona, Wetland Analysis and Mitigation, Algona, Washington. Katie served as wetland specialist for review of the Waste Management site in the City of Algona. Waste Management required renewal of the Conditional Use permit for continuing to process commercial construction waste and for recycling soil. The delineation was field verified and the mitigation was reviewed for compliance with the Sensitive Areas Ordinance.

LDS Church, Wetland Delineation and Mitigation, Buckley, Washington. Katie served as wetland specialist for delineation and conceptual mitigation of a site in the City of Buckley for the LDS Church. The site was particularly difficult to delineate due to disturbed soils and vegetation. The delineation was reviewed by the City's consultant and by the Corps of Engineers and approved. Preliminary mitigation was acceptable and will be subject to review of the final plan.

Federal Way School District, Wetland Delineation and Mitigation, Federal Way, Washington. Katie was wetland specialist for a delineation and mitigation project for Federal Way Junior High No. 6. The wetland was a result of past gravel mining operations, which created a small emergent wetland less than 3,000 square feet in size. The mitigation created an emergent wet pond, which was incorporated into the storm water system. The City of Federal Way accepted both the delineation and mitigation. In the fall of 1993, the mitigation was implemented and by the end of summer 1994, the wetland had nearly 100 percent cover with the specified plants. In addition, a juvenile Pacific Chorus Frog was seen utilizing the wetland.

Graham Tower Center Wetland Mitigation Project, Graham, Washington. The proposed development project required wetland mitigation planning and functional design to offset impacts to approximately 0.70 acre of wetland. The mitigation plan included creation of both emergent and scrub-shrub wetland habitat transitional to a forested wetland system. The proposed mitigation enhanced the overall wetland system due to the degradation of the existing wetlands. An over-time contract was negotiated with Pierce County Planning and Land Services to complete the wetland delineation and mitigation plan review on a short time line. Katie served as project manager.

Natural Resources and Mitigation Plan Review Services, Seattle-Tacoma International Airport Third Runway Project, Seattle, Washington. Katie is project manager for natural resources and mitigation plan review services associated with the proposed Sea-Tac Third Runway project. The scope of work included developing 401 water quality certification conditions. This project was done for the State DOE as an extension of their staff. Katie completed review of the Natural Resources Mitigation Plan and supporting documentation. She provided documentation of findings and deficiencies and reviewed additional submittals. Federal 401 water quality certification conditions were drafted.

Sammamish River Sub-basin Wetland Functions Assessment. Katie was the project manager for the Sammamish River Sub-basin Wetland Functions Assessment. Using the Washington State wetland functions assessment, Katie assessed nine wetland assessment units in the Sammamish River basin. This was the first project of its kind done at a watershed level. The purpose of the assessment was to evaluate the functions of each wetland and gain an understanding of the role each play in the basin. She developed recommendations for our client, King County DNR, on where they might consider allocation of available restoration resources in the future.

Bellevue Parks/Pacific Science Center, Mercer Slough Environmental Learning Center, Bellevue, Washington. Katie served as project manager and lead biologist for environmental permitting, wetland delineation, wetland mitigation and biological assessment for development of Mercer Slough Environmental Learning Center for Bellevue Parks and the Pacific Science Center. Initial site investigations were conducted to assess the site limitations and develop a preliminary layout. Our input was integral to help to select the best layout with the least impact to the natural resources.

Pierce County Planning Department, Wetlands Management Program, Tacoma, Washington. Katie served as wetland biologist for the Pierce County Planning Department responsible for administering the Wetland Management/Regulations. She administered the process through site inspections to verify the presence of wetlands, categorize wetlands, and determine if activity will occur within the wetland or buffer boundary; delineate wetlands, and prepare, review, approve, or deny noncompensatory and compensatory wetland mitigation reports; and determine reasonable use exemptions and take cases to the hearings examiner.

City of Kent, Wetland Inventory, Kent, Washington. Using digital orthophotography and field reconnaissance, Katie updated an inventory of wetlands within the City of Kent. Katie inventoried wetland areas from aerial photography and digital orthophotographs, delineated these areas onto maps, and then conducted field reconnaissance to define the boundaries. The final maps have been digitalized by the City of Kent and added to the wetland inventory. Katie supplied wetland classification according to Cowardin et al and wetland rating according to the City's Management Code category. The final product included an Excel database with attributes for each wetland. The revised inventory will facilitate the City's effort to manage development and also protect wetland resources. Katie served as project manager.

City of Mount Vernon, Sensitive Areas Inventory, Mount Vernon, Washington. As task manager, Katie inventoried wetland and streams using aerial photos and site reconnaissance. She developed maps using aerial photos as a baseline, showing wetlands and streams with the city limits and the urban growth area. She developed riparian enhancement standards and a conceptual mitigation bank to help the City plan development that will be allowed under the Grown Management Act. She assessed five sites for mitigation banking possibilities and rated them for their future use for mitigation sites for proposed capital projects.

City of Umatilla, Sewer Line Upgrade, Umatilla, Oregon. Katie served as biologist for completion of a Biological Assessment completed in Umatilla for a proposed sewer line upgrade. She completed a habitat inventory for potential threatened and endangered species of concerns within the proposed development area. The inventory covered more than 10 miles of additional right of way, several areas adjacent to the existing facility, as well as a crossing involving the Umatilla and Columbia rivers. Both plants and animals were addressed. The final report included an in-depth assessment of the habitats and potential for use by species of concern. Recommendations for avoidance of impacts to species of concern were made. The final report was reviewed and accepted by the federal agencies involved.

May Creek Landslide Repair and Stream Restoration, Newcastle, Washington. Katie was project biologist and permit coordinator for May Creek landslide repair. Permits were acquired from over six agencies. Shannon & Wilson assisted with the negotiation for State Environmental Polica Act (SEPA) lead agency status. We completed both the SEPA and Joint Aquatic Resource Applications processes. Wetlands were delineated along the creek corridor, and final plans for the landslide repair incorporated revegetation of all areas disturbed during construction, fish habitat structures, and stream enhancement features.

Federal Highway Administration, Highway Widening Project, Snohomish County, Washington. Katie served as wetland scientist for delineation and reconnaissance of a 14-mile stretch of the Mountain Loop Highway in Snohomish County. The Federal Highway Administration planned to pave and widen that portion of the highway. As a portion of the requested scope of the National Environmental Protection Act (NEPA) Environmental Assessment (EA), preliminary investigation was completed assessing several alternatives in order to comply with the Corps of Engineers requirement that all wetland impacts be reduced to the best extent possible. Over 100 wetlands were delineated, and more than 75 were reconnoitered within 200 feet of the staked centerline. The work was reviewed and approved by both Snohomish County and the Corps of Engineers.

Wetland Delineation and Mitigation, Graham, Washington. As wetland project manager, Katie completed a delineation and mitigation plan on a site in Graham. The client had cleared and filled more than 8 acres of the 10-acre site. The activity impacted both the wetland and its buffer and was completed without permits from Pierce County. Katie worked to bring the client into compliance with the existing ordinance. The delineation was difficult due to the clearing and filling. The disturbed area methodology was used to locate most of the wetland edge. The mitigation plan was developed with input both from Pierce County and the client. The project was reviewed and accepted by Pierce County.

Federal Highways Administration, Wetlands Delineation, King County, Washington. Katie was wetland scientist for delineation of a 10-mile stretch along Mather Memorial Parkway (Washington) right-of-way (SR-410). Over 60 wetlands were delineated as required for a section of the NEPA EA. The delineation and report detailed the functions and values of the wetlands and outlined potential mitigation possibilities for the road improvement project. The project was reviewed and accepted by the client and the Corps of Engineers.

Endangered Species Act (ESA) Educational Seminar. Katie was a lead technical presenter for a seminar regarding the impacts of the ESA on development projects. Katie developed an educational program presented to engineering and architectural firms on the ESA and how recent changes impact their projects. The seminar covered some basics about the ESA, how the changes are impacting proposed development, and the process necessary to move projects through the regulatory process. As a result of this seminar, attendees are more familiar with the permitting process, which helps to expedite their future projects.

Bonneville Power Administration, Biological Evaluation for (BPA) Riverbank Stabilization Project, Granger Washington. Katie was project biologist assisting with a Biological Evaluation (BE) to discuss the impacts of a bank stabilization project on threatened and endangered species in the Yakima River, Washington. Katie evaluated potential project impacts on ute radish tresses (and orchid). The project also included assisting BPA to obtain permits for the project. The riverbank stabilization project was necessary to protect the BPA main transmission line from the Hanford site to the City of Seattle. The Yakima River is only 35 feet from the transmission tower and is migrating toward the tower at a rate of 10 feet per year. When constructed, the project will protect the tower until a long-term solution can be completed. This will help guard against power failures in Seattle during the winter of 2001-2002.

Tacoma Narrows Bridge, Pierce County, Washington. Katie served as permitting specialist for the in-water geotechnical borings for the new Tacoma Narrows Bridge. She developed the application submittal package to obtain permits for the in-water field explorations. Permit applications were made to the U.S. Army Corps of Engineers, Washington State Department of Fish and Wildlife, Washington State Department of Natural Resources, Pierce County, and the City of Tacoma. Permit application and acquisition was fast track, in order to work during the optimal fieldwork season and state fisheries closure windows. She assisted with the research and documentation for the Biological Evaluation required for concurrence from both National Marine Fisheries Service and US Fish and Wildlife Service. She also assisted with the responses to agency requests for information and preparation of testimony during the shoreline appeals. All the federal, state and local permits and exemptions were obtained in record time.

Federal Aviation Administration, Wetland Inventory, Multiple Sites, Alaska. Katie served as wetland botanist/project manager for a project to inventory, delineate, characterize, and assess functions and values of wetlands for 14 Federal Aviation Administration airports in Alaska (Barrow, Deadhorse, Dillingham, Dutch Harbor, Nome, Petersburg, Port Heiden, Seward, Sitka, St. Mary's, Unalakleet, Valdez, Wrangell, and Yakutat). Field work included ground truthing the aerial photo mapping and observing project sites for compliance with permits issued by the Corps. A Differentially Corrected Global Positioning System was used to assist with mapping wetland boundaries on the Airport Layout Plans. Wetland functions and values were assessed and maps were created depicting the locations of wetlands with high, moderate, and low values. Future proposed airport expansion will be expedited through the NEPA process as a result of the work completed on these sites.

Wetlands Evaluation, Adak, Alaska. Katie performed an evaluation of subarctic wetlands contaminated with petroleum hydrocarbons and metals on Adak Island, Alaska. The evaluation included a wetland delineation, plant species inventory, correlation of plant species and water depth, plant density and water velocity, and preliminary assessment of the efficiency of plant communities in the reduction of contaminant levels. The work was performed to assess the potential to clean up contaminants from the wetlands and then recreate the wetlands in the same area.

Wetland Delineation, King County, Washington. Katie served as wetland biologist for delineation of a 40-acre tract in unincorporated King County. One large wetland was delineated on site and impacts to inventoried off-site wetlands were addressed. Site development alternatives were assessed and a development proposal, which avoided on site wetlands, was engineered. The project was reviewed by King County.

Snake River Plant Community Surveys. Biologist for plant community survey and a water quality and soil characterization for 14 riparian wetland areas on the Snake River in Washington. Intensive sampling was completed over three sampling events. We identified plant communities and documented vegetation succession in the reservoir pools to determine impacts of drawdowns on the plant communities.

Mount Vernon School District, Wetland Delineation, Mount Vernon, Washington. Katie served as wetland biologist for wetland delineation on a 40-acre site in Mount Vernon for Mount Vernon School District. The school district proposed to build both a junior high and elementary school on site and was designing the schools to incorporate the wetlands as amenities and education areas. Two wetlands were delineated on site. The large wetland associated with a natural drainage corridor was delineated using both the routine methodology in undisturbed areas and the disturbed site methodology in an area where the wetland had been filled. Wetland values were determined through a functional assessment included in the report.

Wetland Delineation for Randland Development. Wetland Specialist for delineation of over 25 isolated wetlands on a 40-acre site in Pierce County for Randland Development. The presence of many of the wetlands resulted in modifications to the proposed plat to reduce the impacts to the wetlands. A Nationwide permit from the Corps of Engineers was obtained. A buffer mitigation plan was done to offset impacts from the sanitary sewer line through the site. The project was approved and construction was completed.

EDUCATION

Bachelor of Arts, Botany, August 1990
Bachelor of Science, Psychology, August 1990
Junior Year Abroad Program, University of Exeter, Exeter, England, 1987-1988

ADDITIONAL TRAINING

Washington State Wetland Functional Assessment Methodology, Ecology 2000
Introduction to Soils: University of Washington
Understanding Wetlands and 404 Permitting: American Society of Civil Engineers
Using Constructed Wetlands for Storm Water Treatment: Center for Urban Water Resources Management
Partnerships and Opportunities in Wetland Restoration: U.S. Army Corps of Engineers
Annual Chapter Meetings 1992 – 2001 Society of Wetland Scientists

OTHER EXPERIENCE

Professional Wetland Scientist #1115
Certified Wetland Delineator, Corps of Engineers, 1994
Society of Wetland Scientists – Pacific Northwest Chapter, Board Member, 1997, 1998, 2000, 2001, 2002