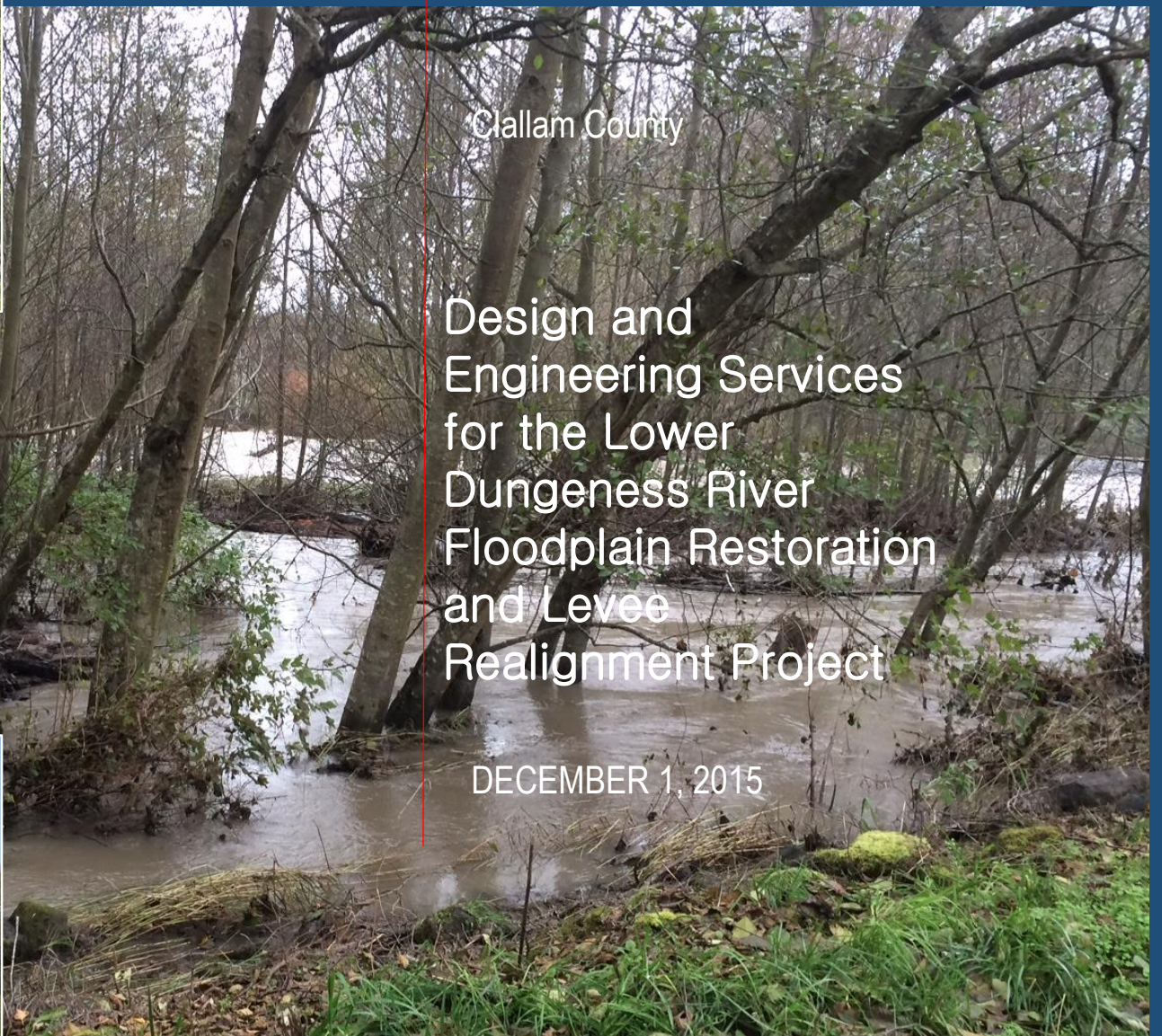
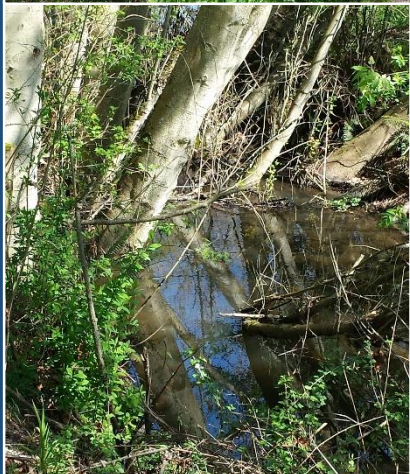


PROPOSAL



Clallam County

Design and
Engineering Services
for the Lower
Dungeness River
Floodplain Restoration
and Levee
Realignment Project

DECEMBER 1, 2015



SUBMITTED BY
GEI Consultants, Inc.
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December 1, 2015

Consulting
Engineers
and Scientists

Board of Clallam County Commissioners
223 East 4th Street, Suite 4 (Room 150)
Port Angeles, WA 98362

**Re: Proposal for Design and Engineering Services for the Lower Dungeness River
Floodplain Restoration and Levee Realignment Project**

GEI Consultants, Inc. (GEI) is excited to present our proposal to provide services to Clallam County for the captioned RFP, providing services for a multi-objective project to set back the Lower Dungeness River levee, restore the floodplain, gather community input and reconfigure Towne Road. We have planned, designed, permitted, and managed construction for several award-winning multi-objective levee setback and restoration projects for flood and erosion hazard reduction that have restored river and floodplain habitat.

GEI's team of more than 750 engineers and scientists have decades of experience in managing large multi-disciplinary projects, over performance periods extending up to 10 years and exceeding \$100 M in construction scope. Our proposed project manager and point of contact, Jeremy Pratt, and our design manager, Alberto Pujol, have worked together on a previous high profile multi-objective dam removal and stream restoration project on the Carmel River. They each have focused throughout their careers on managing large multi-disciplinary projects to resolve long-standing resource conflicts in complex regulatory environments. Jeremy has forged a reputation for his unique ability to combine multi-disciplinary planning and science with his skills in facilitation.

GEI has assembled a team of distinguished subconsultants with long experience on the North Olympic Peninsula, Northwest stream restoration, community outreach, and road engineering, profiled below. We have attached a table listing GEI and all subcontractor contacts, providing the requested contact information. GEI has received all four addendums to the RFP.

Natural Systems Design (NSD) focuses on engineering the restoration of streams, rivers, shorelines, and wetlands, including the three largest restoration projects to date on the Dungeness River. Their interdisciplinary team combines ecology, geomorphology, hydrology, hydraulics, and engineering to restore river systems throughout the Pacific Northwest. NSD specializes in restorative flood protection and floodplain reconnection design in settings where both human infrastructure and restoration of listed fish and wildlife habitat are important. They have worked extensively with County Emergency Management teams, WSDOT, the Federal Highways Administration and Tribal governments to provide levee setback and removal analysis, restorative flood protection and floodplain restoration design on large, dynamic river systems. NSD leaders authored Washington State and Puget Sound guidelines for channel migration zone delineation, and National Large Wood Design Guidelines for the Bureau of Reclamation.

Parametrix has decades of experience in providing transportation engineering to WSDOT, counties, municipalities, and tribes around the state. Parametrix has worked closely with county road staff on the design and construction of several road and trail projects in Clallam County over the past ten years, and conducted other North Olympic Peninsula projects for the City of Sequim, and the Jamestown S'Klallam, Lower Elwha Klallam, Makah, and Quileute tribes. Parametrix design team possesses the full range of requisite skills: geometric design, plans/specifications preparation, and engineer's estimates of probable construction costs for trails, local roads, bridges, and highway projects. They have provided services in rural areas from planning and alternative phases through final design and construction.

ESA has been working on the Clallam County shoreline master program update for several years,

gaining familiarity with the land use, regulatory and natural systems of the Dungeness valley and will apply this knowledge to the levee setback project. Their highly experienced team of biologists, landscape architects, geomorphologists, and engineers bring extensive experience in design and construction of fluvial restoration projects that maximize ecological functioning. The majority of their projects balance habitat restoration goals with human uses including flood protection, transportation, recreation, access, and public facilities.

James Wengler has more than 30 years of experience as Professional Land Surveyor in Clallam County, including the Clallam County Geometric Framework, a comprehensive resurvey of approximately 200 sections within Clallam County. His mapping experience includes surveys of the Dungeness River, Bell Creek, Morse Creek, Clallam River and the Elwha River.

EnviroIssues (EI) provides public involvement, facilitation and communications services on sensitive, often controversial projects. They excel in integrating local knowledge to ensure that outreach is relevant to project goals and the affected community. EI understands how to educate and engage the public on major environmental projects, including watershed restoration. Their decades of experience on natural resource projects are grounded in the natural resources backgrounds of many of their staff. EI supported Port Gamble cleanup through the Puget Sound Initiative and WRIA 18 rule-making for Dungeness River flows; managed outreach for Puget Sound Partnership Action Agenda updates, and facilitated the Tolt River Levee Setback/Salmon Habitat Project and the Lower Puyallup River Protection Executive Task Force. EI is a certified Disadvantaged Business Enterprise (DBE) and a Women's Business Enterprise (WBE) in compliance with federal requirements.

ERM's Mike Cox brings to his independent restoration design review role two decades of water resources engineering experience for stream restoration design, aquatic habitat enhancement, hydraulic analysis, surface water modeling, fish passage, floodplain management, hydrologic assessment, and bank stabilization.

KBA's Kevin Stoll brings to his independent levee design and constructability the background and experience to assure design compliance with U.S. Army Corps of Engineers (USACE) standards. His 20+ years in the planning, design, and construction of projects includes 8 years with USACE Districts including Seattle, and direct experience on levee setback projects and on projects in Clallam County. As Deputy Director of the Seattle District, Kevin oversaw staff responsible for supporting a \$650 million annual program of construction and engineering services throughout the Northwest..

Dave Shreffler has 26 years of experience in fisheries biology and restoration of riverine habitats, planning salmon recovery at the landscape scale, reviewing and evaluating environmental restoration projects, and performing field studies throughout Puget Sound. He will inform the team with his intimate knowledge of the fish habitat conditions and opportunities of the Dungeness River Watershed.

We look forward to your favorable review and the opportunity to interview, if requested. Please contact me at any time for additional information at my direct number 206.757.3224 or cell 206.755.3763, or via email at jpratt@geiconsultants.com.

Sincerely,

A handwritten signature in blue ink that reads "Jeremy Pratt". The signature is fluid and cursive, with the first name "Jeremy" and last name "Pratt" clearly distinguishable.

Jeremy Pratt
Vice President

GEI TEAM CONTACT INFORMATION

FIRM	CONTRACT
GEI Consultants, Inc. (Prime Contractor)	Jeremy Pratt 2701 First Avenue, Suite 400 Seattle, WA 98121 T: 206.757.3224 C: 206.755.3763 jpratt@geiconsultants.com
Natural Systems Design (NSD)	Tim Abbe 95 South McCrorie Road Port Angeles, WA 98362 T: 206.834.0175 C: 206.681.8697 tim@naturaldes.com
Parametrix	Happy Longfellow 719 2 nd Avenue, Suite 200 Seattle, WA 98104 T: 206-394-3649 C: 425.417.8659 HLongfellow@parametrix.com
ESA	Margaret Clancy Vice President 5809 Shilshole Ave NW, Suite 200 Seattle WA 98107 T: 206.789.9658 C: 206.794.1548 MClancy@esassoc.com
Wengler Surveying & Mapping	James Wengler 703 East Eighth Street Port Angeles, Washington 98362 T: 360.457.9600 james@wenglersurveying.com
EnviroIssues	Sarah Brandt 101 Stewart Street, Ste 1200 Seattle, WA 98101 T: 206.922.6274 C: 206.300.4044 sbrandt@enviroissues.com
ERM	Mike Cox #1 9th Street Island Dr. Livingston, MT 59047 T: 406.222.7600 C: 406.224.7088 Mike.Cox@erm.com
KBA	Kevin Stoll 11201 SE 8th St, Suite 160 Bellevue, WA 98004 T: 425.455.9720 C: 206.696.4625 KStoll@kba.com
Shreffler Environmental	Dave Shreffler 3890 Lost Mountain Road Sequim, WA 98382 C: 360.477.2558 lostmntnloft@olympus.net

EXPERIENCE AND PAST PERFORMANCE (CRITERIA B)

GEI Consultants, Inc. (GEI) has assembled a team with long experience on the North Olympic Peninsula and leading expertise in levee setback design, Northwest stream restoration, community outreach, and road engineering. GEI has led award-winning multi-objective levee setback and restoration projects (described below) and is fully conversant with the U.S. Corps of Engineers (Corps) and Federal Emergency Management Agency (FEMA) levee certification. Our team has managed many complex, multi-disciplinary projects for flood and erosion hazard reduction that have restored river and floodplain habitat. We have undertaken quantitative and systematic analysis of alternative design solutions within river and floodplain environments.

Our management team is uniquely skilled at facilitating collaborative interaction among project proponents and the community. We have built our reputations on navigating controversial projects to resolve long-standing resource issues in complex environments. We know how to marry multi-disciplinary engineering, science, and planning capabilities with skills in facilitation, regulatory compliance, and large project management to keep challenging projects on budget and on schedule. These assignments entail multiple competing factors and require solutions that achieve buy-in from multiple stakeholders and jurisdictions.

GEI has been recognized nationally for more than 40 years as experts and leaders in levee design and safety engineering. Hand in hand with our levee practice, GEI has maintained a core business in flood management for decades with a solid track record in managing complex flood projects. We apply an integrated approach in which structural and non-structural strategies are combined to provide watershed management, land use planning, coordinated flood operations, improved flood channels, and facility planning and design. We develop solutions that integrate flood protection and environmental strategies.

The GEI Team has recent experience and intimate familiarity with the Dungeness River. We have brought together a remarkable restoration team, gathering the best of not just one, but three leading Northwest restoration practices, including Natural Systems Design, ESA, and ERM. We have amplified their capabilities by the addition one of the North Olympic Peninsula's leading fisheries biologists, Dave Shreffler. For stream and floodplain restoration, this is truly an unmatched group.

Our proposed transportation engineer, Parametrix, has worked closely with County road staff on the design and construction of road and trail projects in Clallam County over the past 10 years, including the Olympic Discovery Trail and road projects from Sequim to the Elwha.

Projects demonstrating experience for Criteria B and C are shown following Criteria C below. For Criteria B key projects include the Bear River, Feather River and Puyallup River levee setback projects. Each of the disciplines list in Criteria C contains cross-reference to key projects in the following project section of this proposal.

DISCIPLINE-BASED PROJECT EXPERIENCE (CRITERIA C)

A. Hydraulic Modeling and Scour Analysis **(key projects: Upper Puyallup River Reach Assessment & Lower Elwha Restoration)**

Hydraulic analysis and modeling is a core service that **GEI, NSD, and ESA** all bring to the team. **NSD will lead this task**, bringing staff who have 20+ years of experience conducting detailed hydrologic, 1-D and 2-D hydraulic modeling, and sediment transport analyses for restorative flood protection and mitigation projects, floodplain restoration, levee setback, side channel habitat, and bioengineered bank stabilization. We use the best available science, engineering, and planning to assess scour hazards, evaluate alternatives, and recommend solutions. We have had good success with running channel stability models such as the UBC Regime model, BSTEM (Bank Stability and Toe Erosion Model) and our own scour models to assess hazard areas. For scour analysis we use methods described in HEC-23 (Stream Stability at Highway Structures) and HEC-18 (Evaluating Scour at Bridges). Our team has successfully applied numerical models to riverine and estuarine systems throughout Washington, Oregon, and California. Our modelling studies have supported floodplain management and flood emergency response, land use planning, flood risk assessment, bridge and culvert hydraulic analysis, stormwater management, and habitat restoration studies and designs for local, state and federal clients.

Leif Embertson is a certified floodplain manager (CFM) who has mapped and analyzed more than 50 miles of FEMA floodplains. Our team performs “no-rise” hydraulics analyses and floodplain re-mapping (CLMOR/

LOMR) for projects within regulatory floodplains. We regularly perform statistical analysis of flood probabilities, derivation of channel flow, and determination of channel forming discharge using a wide variety of models, including 1D and 2D hydraulic models, HEC-RAS, HEC-GeoRAS, RiverFlo-2d, River2d, FESWMS, RMA2, HEC-HMS, and HEC-SSP, Mike 21, SRH-2D, or DELFT3D. We fully understand how to analyze hydraulic and scour effects for crossings, and we are conversant with Washington State requirements for fish passage.

B. Geomorphic Response Analysis

(key projects: Channel Migration Zone Guidelines & Maynard Nearshore Restoration)

NSD will lead this task, under the supervision of Dr. Tim Abbe, who has led river hazard assessments, flood protection design, and mitigation design on rivers throughout Clallam County, including the Dungeness, Elwha, Pysht, Clallam, Ozette, Hoh, and Bogachiel rivers, and elsewhere in Washington on the Puyallup, Wenatchee, Skagit, and Nooksack rivers. NSD and ESA geomorphologists are skilled at assessing stream and river geomorphic response to changing river management approaches. Our team worked closely with the Washington Department of Ecology (DOE) to develop and update the current state guidelines for Channel Migration Zone (CMZ) Assessment. We provide expert consultation in environmental geology and hydrogeology focused on surface water systems, hyporheic groundwater, shallow unconfined aquifers, bank and slope stability and assessment of earth surface processes that influence ecosystems, landscape evolution and human communities. GEI's proposed lead geomorphologist, Dr. Abbe, is a Washington licensed geologist, hydrogeologist, and engineering geologist. NSD's senior geologist Mary Ann Reinhart is a licensed engineering geologist, renowned for her Northwest work in channel migration zone delineation. Together the GEI Team brings more than a century of experience in environmental geology, primarily focused on surface water and shallow groundwater problems related to storm water runoff, erosion, sediment and water budgets, environmental hazards, and habitat restoration.

C. River Erosion Scour Protection Design

(key projects: Upper Dungeness Restoration & Sandy River Flood)

NSD and ESA bring a strong history of providing successful streambank stabilization counter-measures along roadways and other streamside infrastructure. We review geomorphic processes contributing to erosion to determine the best design to provide long-term protection, and published studies and scientific literature to evaluate critical shear stress and unconsolidated sediment as they relate to the potential for toe scour along the stream bank, a key mechanism of bank failure. Working at the interface between soil and water, we solve streambank erosion and streambank instabilities by combining analysis of natural stream processes with the application of state of the art materials and tried and true civil engineering techniques. We have found that a combination of soft and hard bank treatments (such as those outlined in FHWA HEC-23 and the WDFW Integrated Streambank Protection Guidelines) provide for robust bank treatments that benefit habitat and are efficient to permit. Our team emphasizes sustainable, long-term solutions that are integrated with the surrounding landscape, meeting civil infrastructure, flood protection and habitat enhancement goals. We develop restoration solutions that balance human infrastructure requirements with ecosystem and regulatory needs for listed and endangered species. Our projects often address roads and bridges, levee removal, engineered log jam design, side channel and backwater habitat, and wetland and riparian corridor restoration. We provide support through construction, commonly answering requests for information (RFIs) from contractors, reviewing contractor bids, attending onsite meetings, staking the location of restoration elements, and providing construction observation and inspection.

D. Alternatives Analysis

(key projects: Thornton Creek Confluence Restoration & Upper Quinault Habitat Restoration)

Effective large-scale restoration projects typically require balancing multiple objectives, which may not completely align. Successful projects require robust technical solutions and solid communication strategies to ask the right questions in the technical analysis, develop restoration alternatives, and design project elements that are acceptable to the key stakeholders. Our team has experience in restoration alternatives design that integrates site constraints with flood hazard reduction, habitat benefits, constructability criteria, and permitting considerations. The latter takes into account the requirements of jurisdictional critical areas regulated at federal, state, and Clallam County levels.

We use conceptual models to illustrate a functional outcome associated with restoration options. We base conceptual models on applied geomorphology science and engineering principles. These models portray overall site functions, showing feedbacks between project elements and design elements to facilitate understanding and compare alternatives. For example, on this project we might explore the concept of a purchase and grazing leaseback of Creamery lands to expand the floodplain under project ownership, thus creating more opportunities under Corps guidelines to consider levee alternatives.

We envision the alternatives analysis process to be interactive with the County, Corps, and other stakeholders as viable options are scoped and considered. Our process (illustrated here) centers on progressive data and option development, often using collaborative workshops to examine options, refine approaches, and solve potential problems or issues. Our experience indicates that this level of collaborative engagement usually spawns creative ideas that improve the final options leading to the best overall workable solution. A conceptual alternative analysis process is shown in the diagram to the right, that can be shortened and tailored to the timeframe required for the Lower Dungeness process.

E. Engineering Design (key projects: Green River Levee & Valley Access)

GEI, NSD, ESA, and Parametrix will all participate in a multi-dimensional engineering design that addresses the levee setback, river and floodplain restoration, and road reconfiguration. As the project moves into engineering, we bring forward the lessons from the alternatives analysis incorporating geomorphic and ecological objectives into design. The conceptual model(s) developed in the alternatives analysis pre-design phase support this connectivity. A key outcome will be clear articulation of design in terms of project geomorphic, topographic, hydrologic, and hydraulic requirements.

GEI has extensive experience in engineering design for levee projects within a multi-objective framework integrating river and floodplain objectives, as described above. The GEI Team's experience in preparing conceptual designs, final designs, construction drawings, technical specifications, and bid documents for flood control and habitat restoration projects is unsurpassed. Over the past 10 years, we have completed conceptual and/or final designs for multi-discipline flood control projects with construction costs up to \$100 million. We are thoroughly experienced in design-bid-build project delivery and the preparation of construction bid packages.

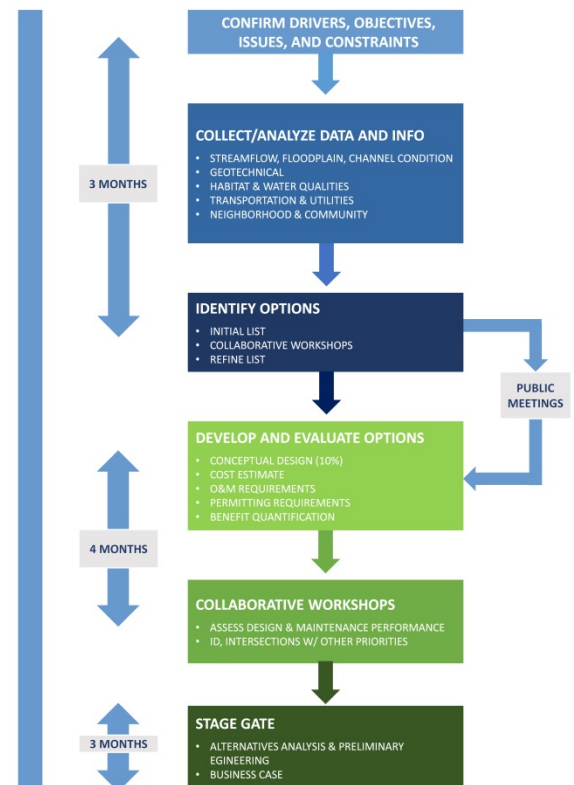
The GEI Team has substantial experience with the Corps design review process, including using the DrChecks tracking tool to coordinate review. We understand the value and importance of the Corps as a key stakeholder, and will accommodate their review in the project schedule using in-person design presentations.

Parametrix possesses a full range of transportation staff with the skills necessary to provide the needs for this project, including geometric design, plans/specifications preparation, and engineer's estimates of probable construction costs for local roads, trails, bridges, and highway projects. We have extensive experience with design-bid-build project delivery and the preparation of bid documents.

F. Professional Land Surveying (key projects: Clallam County Geometric Framework & Jobs for the Environment)

Professional land surveying will be handled by Wengler Surveying & Mapping, who recently completed a comprehensive resurvey of approximately 200 sections within Clallam County for the Clallam County Geometric Framework. Mr. Wengler has more than 25 years of experience as a professional land surveyor, having completed hundreds of projects for which he was responsible for establishing primary control points, establishing or

ALTERNATIVES ANALYSIS PROCESS



recovering right-of-way, property and easement lines. He has participated on project design teams to identify topographic information needs, support the collection of field data, integrate survey data into engineering and construction use. He is fully conversant with all requirements to assure that survey documents are recordable and compliant with State laws and codes, having been appointed by the Governor to the Board of Registration for Professional Engineers & Land Surveyors (2014-2019) and having been honored as the Land Surveyors' Association of Washington Surveyor of the Year in 2006. Mr. Wengler is past president of the Land Surveyors' Association of Washington.

G. Transportation Design *(key projects: Olympic Discovery Trail & Old Blyn Highway)*

Parametrix brings unique skills and experience to the leadership of this task, drawing on a number of past projects conducted for the Jamestown S'Klallam Tribe and Clallam County. Parametrix evaluated the traffic needs of the local road network to develop and screen alternatives to close, realign or reconnect Chicken Coop and Zaccardo Road to US 101. Both roads were classified as minor collector roads and Very Low Volume Roads (less than 400 ADT). The alternatives were based on network connectivity and average daily trips (ADT). Trips were redistributed to determine the future ADT of each road. The design roadway section and geometry was designed following AASHTO and the low-volume road criteria according to future year volumes. A key evaluation factor was the costs of improvements. Parametrix regularly develops preliminary estimates of probable construction costs at both the alternatives stage and for construction plans and specifications. Parametrix has extensive experience working with County road engineering staff on road and trail design segments to meet County standards, including several segments of Olympic Discovery trail and on projects in both rural and built settings, as well as smaller recreational trail spurs. Their least cost planning approach has saved hundreds of thousands of dollars in the course of developing preferred alignments, such as for the new tsunami evacuation road from the Lower Elwha Klallam Tribe reservation along the Elwha River to the County Road network. Parametrix road design work typically includes constrained multi-goal projects. For example, the tsunami evacuation road also had to be coordinated with the Elwha River Levee project, sewer connection to the City of Port Angeles, and right-of-way and critical areas ordinances. Key skills and experience for that project included traffic analysis, design and posted speed, min/max grades, superelevation, sight distance, and other geometric criteria.

RELEVANT PROJECT EXPERIENCE

We have included the following relevant projects that describe in detail the experience of our team:

BEAR RIVER SETBACK LEVEE AND RIVER RESTORATION, CA

Owner: Three Rivers Levee Improvement Authority (TRLIA)
Contact: Paul Brunner, PE; Executive Director; 530.749.5679; pbrunner@co.yuba.ca.us
Key Staff: Alberto Pujol, Jim Nickerson, Graham Bradner
Performance Period: 2004-2007
Cost: \$6.7 M
Awards:

- Flood Control Project of the Year - 2008, American Society of Civil Engineers, Region 9
- Coast, Oceans, Ports, and Rivers Institute Award - 2007, American Society of Civil Engineers, Sacramento Section

GEI worked with Yuba County and Reclamation District 784 to investigate regional solutions and local projects that could mitigate a long history of catastrophic flooding along the Feather, Bear and Yuba Rivers in Yuba County, California. We evaluated alternatives and constructed a FEMA-certified 10,000-foot-long setback levee providing additional floodway capacity while lowering the water surface profile by about three feet during

major flood events. A unique aspect of this design was the degradation and reuse of the old Bear River Levee.

The GEI Team also provided environmental permitting, public outreach, and habitat restoration and enhancement. We designed environmental restoration enhancement measures, including creation of native grasslands to mitigate for the threatened Swainson's hawk habitat, creation of wetlands, and establishment of native riparian habitat. In addition to restoring riparian habitat, a floodplain swale was constructed to mitigate for potential fish stranding and increase the frequency of floodplain inundation, yielding further ecosystem benefits.

Project challenges included designing and building the levee on a foundation composed of highly-variable soft and pervious streambed deposits, and meeting an accelerated schedule demanded by the California Reclamation Board and the Corps. GEI performed fast-track geotechnical investigations and preliminary engineering, as well as environmental permitting and right-of-way acquisition. Building a new levee requires a great deal of earthen fill materials which need to be transported to the construction site. By reusing material from the existing levee, environmental costs associated with transport were minimized. Reused material accounted for nearly half of the 1 million cubic yards that were used to construct the setback levee.

FEATHER RIVER PHASE 4 LEVEE REPAIRS AND SETBACK, CA

Owner: Three Rivers Levee Improvement Authority (TRLIA)
Contact: Paul Brunner, PE; Executive Director; 530.749.5679;
pbrunner@co.yuba.ca.us

Key Staff: Alberto Pujol, Jim Nickerson, Graham Bradner, Matt Powers, Steve Winter

Performance Period: 2007-2014

Cost: \$22.8 M

Awards:

- Outstanding Flood Management Project – 2011, ASCE, Region 9
- Flood Control Project of the Year – 2009, ASCE, Sacramento Section

This FEMA-certified levee repair project corrected seepage deficiencies along 13 miles of an existing levee along the Feather River and lower Yuba River. This section had failed in 1997, resulting in the loss of three lives and several hundred million dollars in property damage. The repair provides Reclamation District 784 with protection against a 200 year flood.

The project consisted of constructing slurry cutoff walls, seepage berms, and relief wells to strengthen 7 miles of existing levee, and constructing a 6 mile-long setback levee, which is now the longest setback levee in California. We constructed 30,300 feet of earthen embankment using 4 M cy of fill from local borrow sites and a 26,000-foot soil-bentonite cutoff wall ranging up to 78 feet deep. We installed 26 relief wells and a landside drainage canal; a major pump station; and levee performance instrumentation. We removed the old levee and structures within the expanded floodway.

ESA teamed with GEI to simulate a series of sediment transport scenarios for channel migration and levee erosion, and restore 600 acres of floodplain habit. We also constructed a floodplain drainage swale to mitigate for potential fish stranding; drainage and storm water pollution prevention. Environmental protection measures and site restoration were undertaken on 1,000 acres within the levee setback area and floodway.

The project posed two significant challenges: characterizing aged, heterogeneous, and poorly constructed levee embankments on a foundation composed of highly-variable, soft, and pervious streambed deposits; and meeting an accelerated schedule driven by the need to achieve the flood protection objectives as soon as possible and at minimum cost to the landowners.

PUYALLUP RIVER LEVEE SETBACK FEASIBILITY EVALUATION, WA

Owner: Pierce County Public Works

Contact: Tom Nelson; 253.798.4645; tnelson2@co.pierce.wa.us

Key Staff: Tim Abbe, Shawn Higgins

Performance Period: 2007-2014

Cost: \$43,299

NSD evaluated the feasibility of setting back levees at 32 potential sites on the Puyallup, Carbon and White Rivers in Pierce County. They identified sites where the reconnection of floodplains could increase flood storage and achieve natural restoration of in- and off-channel aquatic and riparian habitats at each site.

NSD developed prioritization criteria designed to identify sites offering the greatest potential for achieving project goals. Detailed characterizations of existing geomorphic and hydrologic conditions were under-taken at each site, evaluating predicted long-term changes in key channel and floodplain features and processes.

Geomorphic/hydrologic floodplain and channel-forming process were evaluated. A LiDAR-based Hec-GeoRAS hydraulic model was developed, providing 3D images of flow depths and velocities for selected flows. Existing and future habitat needs were integrated and prioritized to identify sites favoring long-term channel function, floodplain utilization and habitat development. Project deliverables included a detailed catalogue of 32 sites, HEC-RAS models for numerous recurrence interval storm events, a prioritization strategy workbook, the project data base, 30% design drawings for two selected sites, and a three-dimensional animation film simulating a low elevation fly-over of the Puyallup, Carbon and White River floodplains.

UPPER PUYALLUP RIVER REACH ASSESSMENT AND ORVILLE ROAD PROTECTION DESIGN PHASES A, B, AND C, WA

Owner: Pierce County Public Works

Contact: Tom Nelson; 253.798.4645; tnelson2@co.pierce.wa.us

Key Staff: Tim Abbe, Shawn Higgins, Mike Ericsson

Performance Period: 2013-Ongoing

Cost: \$310,958

NSD is assisting Pierce County Public Works on a corridor assessment of the Orville Road along the Upper Puyallup River. Dr. Abbe previously led a comprehensive analysis of the river to evaluate erosion and flood hazards and developed a self-mitigating solution to protect Orville Road. Technical analysis included fieldwork, 1-D and 2-D hydraulic modeling, sediment transport, and wetland and fisheries assessments working with Pierce County staff. NSD's design was well received by NOAA and Puyallup and Muckleshoot Tribes as a restorative means of protecting the highway. The primary goals are to provide long-term "restorative" flood protection for Orville Road. Once implemented, Phase A won a 2014 American Public Works Association Award for protection of Orville Road from severe erosion created by the Puyallup River.

LOWER ELWHA RIVER RESTORATION, WA

Owner: Lower Elwha Klallam Tribe
Contact: Mike McHenry; 360.452.847
Key Staff: Tim Abbe, Shawn Higgins, Mike Ericsson
Performance Period: 2015-Ongoing
Cost: \$150,000

Dr. Abbe has been working in the Elwha River for 15 years, where his engineered logjam (ELJ) work has been a crucial component of restoring the river's lower 3 miles prior to and following dam removal of the Elwha and Glines Canyon Dams 2011-2013. He led detailed geomorphic investigation to evaluate in-stream habitat and function of existing ELJ's. In addition, a 2-dimensional hydraulic model was used to predict flow distribution following predicted aggradation. The results of these analyses informed design architecture and layout of additional habitat structures to provide stable, long-term salmonid habitat. ELJ structures are designed to withstand a 100 year flood and maintain pools while the river aggrades as a result of sediment release from dam removal.

CHANNEL MIGRATION ZONE (CMZ) GUIDELINES, WA

Owner: Washington Department of Ecology
Contact: Patricia Olson; 360.407.7540; pols461@ecy.wa.gov
Key Staff: Tim Abbe, Mary Ann Reinhart, Shawn Higgins
Performance Period: 2012-2014
Cost: \$62,845

Dr. Abbe and Ms. Reinhart led a team of geomorphologists to develop a 'planning level' methodology for CMZ delineation and completed 500 miles CMZ mapping for Clallam County and Puget Sound streams in 2011.

MAYNARD NEARSHORE RESTORATION, WA

Owner: North Olympic Salmon Coalition
Contact: Kevin Long, Project Manager; 360.379.8051; projectmanager@nosc.org
Key Staff: Steve Winter
Performance Period: 2011-2014
Cost: \$100,000

ESA supported the restoration of over 2,000 feet of shoreline at the head of Discovery Bay in Jefferson County, focusing on restoring a natural beach profile and nearshore processes along a shoreline that had been highly altered by an abandoned timber mill and railroad corridor. The North Olympic Salmon Coalition (NOSC) started the restoration process by removing buildings and contaminated soils. ESA's design helped to improve habitat for juvenile salmon, forage fish and native shellfish by removing shore armoring, removing the creosote trestle, and replacing a culvert with a bridge to restore tidal hydrology to a small freshwater lagoon that had been cut off from the Bay.

The Maynard shoreline project occurred along a stretch of shoreline with many public and private interests. The restoration designs therefore considered a number of stakeholder considerations, including a private waterline, the future Olympic Discovery Trail alignment, and Olympia oyster beds that occur within the project area. ESA developed a set of restoration alternatives to address these myriad concerns. The conceptual plans left intact some of the constraints that significantly reduced the potential for restoration of natural processes at this site. ESA developed an alternatives and geomorphic analysis that illustrated site outcomes if these constraints were removed. Subsequent stakeholder discussions resulted in a dramatic increase in the site's restoration benefit.

UPPER DUNGENESS RIVER RESTORATION, WA

Owner: Jamestown S'Klallam Tribe
Contact: Hilton turnbull, Habitat Biologist; 360.683.1109
Key Staff: Tim Abbe, Leif Embertson
Performance Period: 2012-2013
Cost: \$99,920

NSD provided geomorphic assessment and ELJ design for restoration of habitat complexity within anadromous reaches of the Greywolf and Upper Dungeness Rivers. Historical wood removal projects depleted large wood from these river reaches and degraded salmon and char habitat. NSD completed an evaluation of potential wood placement sites within a six-mile segment, and a basin scale characterization of watershed processes, hydrologic conditions, and sediment sources. Twenty-one sites were evaluated and prioritized based on geomorphic characteristics and potential biologic benefits.

SANDY RIVER PHASE I FLOOD EROSION HAZARD STUDY AND RESTORATIVE FLOOD PROTECTION PROJECTS, OR

Owner: Clackamas County
Contact: Jay Wilson, Resilience Coordination, Emergency Management; 503.723.4848; jaywilson@co.clackamas.or.us
Key Staff: Tim Abbe
Performance Period: 2014-2015
Cost: \$121,500

NSD was hired by Clackamas County to provide basin scale watershed and geomorphic assessment to characterize flood erosion hazards of the upper reaches of the Sandy River most recently impacted by the January 2011 disaster flood event. A primary task of Phase I was the identification of key mitigation sites for flood storage, restorative flood protection and habitat friendly stabilization design. NSD is currently working on the Restorative Flood Response Design project for local leaders to define their goals for flood protection and relief for the entire Upper Sandy River community.

THORNTON CREEK CONFLUENCE RESTORATION, WA

Owner: City of Seattle

Contact: Greg Stevens, Seattle Public Utilities; 206.615.1451;
greg.stevens@seattle.gov

Key Staff: Tim Abbe

Performance Period: 2012-2014

Cost: \$520,000

NSD led a five-firm team through assessment and detailed design of the restoration of the confluence of the north and south branches of Thornton Creek, located in North Seattle adjacent to a major arterial road and along the most productive salmonid bearing stream in the City. The City of Seattle wished to eliminate localized flooding over an adjacent arterial roadway and nearby private properties while restoring natural floodplain function. Project challenges included a high loading of fine sediments, a channel gradient of less than 1 percent and numerous utilities within the project site included sewer, water and power lines.

UPPER QUINULT RIVER HABITAT RESTORATION, WA

Owner: Quinault Tribe

Contact: Bill Armstrong, Quinault Indian Nation; 360.276.8215,
ext. 40; barmstro@quinault.org

Key Staff: Tim Abbe

Performance Period: 2012-Ongoing

Cost: \$200,000

NSD team members have been involved with every phase restoration planning and implementation on the Upper Quinault that aims to restore natural processes across the entire alluvial valley. Dr. Abbe led a geomorphic analysis along 12 miles of the Upper Quinault River that established priorities, options, and constraints for comprehensive restoration of critical off-channel habitat for sockeye salmon in the Upper Quinault River. NSD developed emergency and long-term engineering design guidelines for stable logjams and habitat. The plan was used as the basis for a programmatic permit to guide restoration and flood protection work within the Upper Quinault and provided a model for integrating science, emergency response, community relationships, and land management into an incremental, long-term approach to river restoration.

GREEN RIVER LEVEE FEMA ACCREDITATION, WA

Owner: City of Kent

Contact: Alex Murillo, Engineering Supervisor; 253.856.5528;
Key Staff: Alberto Pujol, Jim Nickerson

Performance Period: 2011-Ongoing

Cost: \$556,000

GEI is assisting the City of Kent to evaluate and certify a 2.8-mile reach of the Green River Levee system in accordance with FEMA requirements (44 CFR, Section 65.10. Certification will

assure that the levees provide protection from the base (1% annual chance) flood. GEI engineering services have included:

- Records search
- Inspections
- Structural, geotechnical, seismic and hydraulic analyses
- Detailed report of the current levee system
- Analysis of needed improvements
- Engineering plans and specs
- Cost estimate for the improvements
- Engineering support during construction
- Certification reports and documentation

VALLEY ACCESS PROJECT, WA

Owner: Lower Elwha Klallam Tribe

Contact: Carol Brown, Community Development; 360.452.8471,
ext. 7443; carol.brown@elwha.org

Key Staff: Happy Longfellow, Phoebe Johannesson

Performance Period: 2009-2011

Cost: \$9.6 M

Parametrix provided project management, planning, engineering, permitting and construction administration for the new primary access road to realign 1.2 miles of existing paved and unpaved Clallam County roads and created 1 mile of new tribally owned road connecting the tsunami zone to the county road network. County road standards were closely followed in coordinating design with the Public Works/Roads department for concurrence and approval. Project work included managing the alternatives development, screening, design, right-of-way acquisition, environmental assessment, PS&E, and construction management. Key roles include coordination with stakeholders (BIA, Clallam County, and the City of Port Angeles), supporting funding pursuits, managing staff, and managing the scope, schedule, and budget.

CLALLAM COUNTY GEOMETRIC FRAMEWORK, WA

Owner: Clallam County Roads Department

Contact: Steve Hauff, County Engineer; 360.417.2263

Key Staff: James Wengler

Performance Period: 1997-1998

Cost: \$9996,000

This massive and ground breaking cadastral survey project included measurement of 1,150 geodetic and cadastral monuments, using GPS and traditional terrestrial traversing methods. It produced 21 records of survey and is being used as the framework for the County's Geographic Information System (GIS). It uses the horizontal datum, Washington State Plane Coordinate System, North Zone, and the vertical datum NAVD 1988 as established by the CCGF. It is the basis of most boundary and topographic surveys performed in the County today. As managing partner, Mr. Wengler wrote specifications for all measurements and adjustments; , managed quality-

controlled survey data from multiple survey crews, and coordinating coordinated field crews and Professional Surveyors from five firms. To achieve a complete mapping project, Mr. Wengler also reviewed the history and validity of cadastral monumentation used within the project and to review the final surveys to be recorded with the county County Auditor.

JOBS FOR THE ENVIRONMENT, WA

Owner: Clallam County, Department of Community Development

Contact: Joel Freudenthal; 360.417.2594;
joel.freudenthal@co.yakima.wa.us

Key Staff: James Wengler

Performance Period: 1997

Cost: \$24,000

These projects required the establishment of both horizontal geodetic control and vertical control monuments along the Dungeness River, Bell Creek, Morse Creek and the Clallam River to produce detailed topographic surveys of the project sites. Control points were used to map critical river components of the rivers or creeks, including ordinary high water mark, thalweg, centerline, vegetation lines, tree species, and utilities.

OLYMPIC DISCOVERY TRAIL (ODG), WA

Owner: Jamestown S'Klallam Tribe

Contact: Annette Nesse, Chief Operations Officer;
360.681.4620; anesse@jamestowntribe.org

Key Staff: Happy Longfellow, Yammie Ho, Phoebe Johannesson

Performance Period: 2008

Cost: \$700,000

Parametrix provided engineering for construction of two new paved permanent parking areas near the Lower Campus along Old Blyn Highway, and 2,000 feet of 10-foot-wide paved shared use trail to state and federal guidelines, a 26-stall one-way parking lot and a 30-stall parking lot. The design work included designs for grading, paving, drainage, sidewalk, trail, retaining walls. We also provided design services during construction. We conducted value engineering on stormwater treatment BMPs, prepared regrading designs for the parking areas, trail, and walls to further reduce construction costs, and provided onsite field verification of surveyed surfaces.

OLD BLYN HIGHWAY TRAFFIC CALMING, WA

Owner: Jamestown S'Klallam Tribe

Contact: Annette Nesse, Chief Operations Officer;
360.681.4620; anesse@jamestowntribe.org

Key Staff: Happy Longfellow, Phoebe Johannesson

Performance Period: 2012-2013

Cost: \$1.1 M

Parametrix provided project management, planning, engineering, permitting and construction administration for this roadway safety project designed and constructed in two phases for the Jamestown S'Klallam Tribe. This safety project provides traffic calming measures along a mile of Old Blyn Highway, a Clallam County road, through the tribal campus area. This project included pavement reconstruction, pedestrian crossings with actuated Rapid Flashing Warning Lights, re-sloping of the roadway to collect stormwater, stormwater treatment using bioretention cells, street lighting, landscaping, curbing, additional signing, restriping, temporary traffic control and temporary erosion and sediment control plans. County road standards were closely followed and design was coordinated with Clallam County Roads Department.

SR 520 BRIDGE REPLACEMENT AND HOV, WA

Owner: Washington State Department of Transportation

Contact: Kerry Pihlstrom, Westside Engineering Manager;
206.770.3500; ruthk@wsdot.wa.gov

Key Staff: Sarah Brandt

Performance Period: 2007-Ongoing

Cost: \$30.8 M

EnviroIssues is managing outreach and communications to improve safety and mobility of the State Route 520 corridor within the City of Seattle. They are currently provides strategic advice related to government relations and environmental, design and outreach communications activities. EI also helped convene, facilitate and provide strategic oversight for multiple stakeholder processes, including:

- A robust community design process involving the Seattle Design Commission, City Council, and several city departments.
- Executive and staff-level coordination meetings between WSDOT and City of Seattle staff, in compliance with an established Memorandum of Understanding.
- A Regulatory Agency Coordination process with project regulators and partners to accelerate the environmental permitting process.
- Developing a Community Construction Management Plan, an innovative approach to construction management that aims to minimize public impacts through robust community engagement, and to manage public expectations through a suite of communications tools.

KEY PERSONNEL (CRITERIA D)

The following table presents Key Personnel for the GEI Team, highlighting their qualifications and experience that will be leveraged to ensure a successful project. Resumes are in the Appendix (Tab 1).

NAME	BRIEF BIOGRAPHY
Jeremy Pratt, GEI Project Manager, Co-Lead Community Outreach Specialist	38 years of experience managing large, controversial projects to resolve long-standing resource conflicts in complex regulatory environments. Unique combination of facilitation skills with multi-disciplinary planning and science background. Led multi-objective watershed and stream corridor projects with restoration objectives in the Carmel River, Salmon Creek and Elwha and Dungeness watershed plans. Qualified as Senior Facilitator on the U.S. Institute for Environmental Conflict Resolution National Roster since 2001. As Project Manager for the Dungeness and Elwha watershed plans he coordinated all outreach events and facilitated more than 120 meetings. He will be supported in this role by EnviroIssues.
Alberto Pujol, GEI Lead Civil Engineer/Design Manager	35 years of experience as civil/geotechnical engineer managing infrastructure rehabilitation or replacement projects, including levee setbacks and restoration projects up to \$100 million, such as Bear and Feather River levee setback/restoration projects, both under Corps jurisdiction, and Green River levee remediation in Washington. Washington registration in process.
Jim Nickerson, GEI Lead Geotechnical Engineer	16 years of experience as a lead civil and geotechnical engineer on levee projects. Mr. Nickerson is registered in Washington and has managed several levee projects on the Green River in Washington. He had geotechnical roles on the GEI Bear and Feather river levee and restoration projects.
Leif Embertson, NSD Lead Hydraulic Engineer	Lead Hydraulic Engineer and Certified Floodplain Manager. Leif is a licensed professional engineer in WA, OR, and WY with 14 years' experience in hydraulic engineering and hydrology, including work in the Upper Dungeness, Quinault and Elwha River Restoration project, strong modeling experience (including HEC-RAS), and river and floodplain restoration, design development and project implementation. Leif leads 1- and 2-D hydraulic modeling, scour analysis and erosion protection.
Joe Merth, Parametrix Lead Structural Engineer	24 years of experience as a senior structural engineer and a certified bridge inspector with an extensive background in bridge design and construction, culvert and retaining walls, construction cost estimation, the develop construction documents, and integrating stakeholder input to design. <i>Note: a structural engineer would not normally be needed for a levee project. Based on the prebid conference, we understand that this key individual is to handle structural engineering related to Towne Road, if needed (e.g., small bridges, culverts).</i>
Tim Abbe, NSD Lead Fluvial Geomorphologist	Internationally recognized geomorphologist and licensed professional engineering geologist and hydrogeologist with experience in geomorphology, habitat restoration, risk assessment, self-mitigating flood and erosion protection, sustainable land management, and water resources. Dr. Abbe manages the NSD Port Angeles office and has led more than 100 restoration projects over the past 28 years including leadership on virtually every major Dungeness River restoration project upstream of the estuary (2004-2008 Trestle Reach restoration, 2012-ongoing Upper Dungeness restoration [scheduled for construction in 2016], 2010-12 Lower Dungeness levee setback, and 2015 restoration recommendations for replacement project.)
Steve Winter, ESA Lead Ecologist	17 years' experience managing and designing multi-objective restoration projects to maximize ecological benefits. Steve works across disciplines to integrate ecological and natural resource management, basin planning, stormwater, geomorphic analyses, and hydrologic modeling to achieve stream and wetland restoration goals in freshwater and riverine settings. Steve is a Professional Hydrologist and Professional Wetland Scientist. He will be supported in this role by Dave Shreffler (Shreffler Environmental).
James Wengler Professional Land Surveyor	More than 30 years of experience as a Professional Land Surveyor in Clallam County, including Clallam County Geometric Framework. Mapping projects of the Dungeness River, Bell Creek, Morse Creek, Clallam River and the Elwha River for Clallam County. Licensed Professional Land Surveyor in Washington.
Happy Longfellow, Parametrix Transportation Engineer	22 years of experience as a transportation engineer, responsible for multiple projects conducted on the North Olympic Peninsula, including the Old Blyn Highway, Chicken Coop-Zaccardo Road Realignment, US Highway 101 Sequim East Interchange, Olympic Discovery Trail, and Valley Access Project. Several recent projects have included the design of very low volume roads (ADT less than 400). He will be supported on trail design by Yammie Ho, Parametrix.
Sarah Brandt, EnviroIssues Co-Lead Community Outreach Specialist	15 years of experience as an outreach specialist and technical facilitator, focusing on natural resource recovery planning and environmental communications. Expertise in engaging public, agency, jurisdictional, and tribal partners; facilitating community design advisory groups; planning and delivering open houses, public forums, community surveys, and other forums; and developing suite of outreach materials.

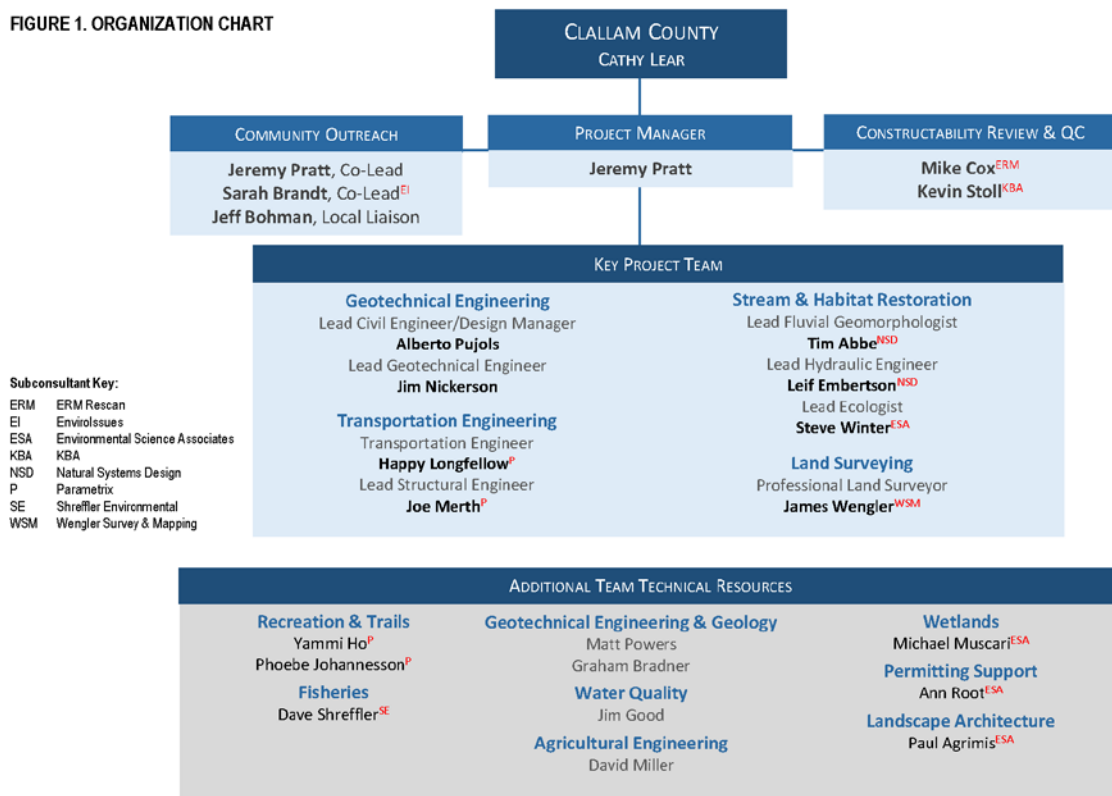
PROJECT APPROACH (CRITERIA E)

A. Organization Chart

Figure 1 on the following page presents the GEI Team proposed organization chart. Jeremy Pratt, our proposed project manager, will report to Clallam County as our direct and always-available point of contact. As co-Lead Community Outreach Specialist, he will lead facilitation supported by Sarah Brandt, EnviroIssues, who as co-Lead Community Outreach strategy will lead outreach strategy. Jeff Bohman will provide our local project liaison for project management and outreach. Alberto Pujol, our Lead Civil Engineer, will serve as Design Manager and lead the project Design Team (described below). Independent quality control and constructability reviews will be conducted by ERM (Mike Cox, restoration), and KBA (Kevin Stoll, levee engineering), reporting directly to Alberto and to the County.

Our organization chart shows key personnel specified in the RFP Criteria D. In addition, GEI has assembled a suite of resources that we believe will be needed for a comprehensive, successful project, including expertise in Dungeness River fisheries (Dave Shreffler); trail design (Yammie Ho and Paul Agrimis) to address the popularity of hiking along the existing levee; stormwater and agricultural drainage (Phoebe Johannesson, David Miller) to address issues raised in the Floodplains by Design Application; and support in key disciplines such as geotechnical engineering and geology (Matt Powers, Graham Bradner), wetlands (Michael Muscari), landscape architecture (Paul Agrimis), permitting support (Ann Root), and water quality (Jim Good). Resumes for this value-added group are provided in Appendix (Tab 2). Substantial staff resources throughout the team will support these key personnel and additional leaders.

FIGURE 1. ORGANIZATION CHART



B. Technical Approach and Project Approach Chart

The GEI Team will carry out the scope as described in RFP Attachment 1 Scope of Work. We propose to hold a Kickoff Meeting with the County attended by our key personnel (listed above, Criteria D) to discuss the scope of work. Based on that meeting, this proposal, and RFP Attachment 1, the GEI Team will develop a detailed project approach in the form of a Work Plan, with an accompanying budget and schedule that will

be submitted to the County and its partners for review. We will facilitate a Work Plan meeting with the County to review all comments and agree on changes to the Work Plan, and after revision, it will serve as the guiding document for project performance. The Work Plan will serve as an integrated management plan, tying together our organization chart (personnel assigned to task), budget, schedule, and scope. It will include a milestone schedule and task linkages.

Coordination and Communication: Design Team

GEI will establish a project Design Team, which will meet regularly with the County and its partners throughout the course of the project to provide direction and integration of all aspects of design, including levee, road, and river restoration. We anticipate that the desired multi-objective design will require iterative integration of all project elements. The Design Team will be led by our proposed Design Manager, Alberto Pujol, and will provide a forum to identify, discuss, and resolve all linkages among the elements of the scope of work, as well as to bring community concerns forward and seek alternatives that can achieve agreement.

Coordination and communication throughout the team will be facilitated by the Project Manager, working closely with the Design Manager and Design Team. Key tools to assure strong communication and close coordination will include regular (at least biweekly) management team conference calls (involving the County and other partners as necessary) and the use of Action Item schedules to facilitate project delivery on the ground. Management team conference calls will serve to update the status of ongoing work, coordinate performance throughout the team, identify and resolve emerging issues, and plan for upcoming activities. Action schedules will be updated and distributed weekly, tagging action items to responsible individuals (including members of the client team). These will include both items with specific scheduled due dates and emerging items, looking out over a 4-6 week horizon.

GEI will also assign a Project Coordinator (Shannon Luoma) to provide cost-efficient project administration in support of the Project Manager, Design Team, and County. Project coordination is a standard role on GEI projects, which provides exceptional value in handling project logistics and managing the day-to-day activities of project implementation. Shannon will coordinate budget tracking and invoicing, maintain the project action schedule, coordinate with the County and its partners, handle team administrative coordination, prepare draft progress reports, and take charge of document formatting and production.

Challenges

Design Integration: This multi-objective project will require ongoing, iterative integration of several very different design elements, each of which could affect the ability of the other design elements to meet their goals and objectives. GEI addresses this through our Design Team, described above.

Community Input: Adjacent landowners and community members need to feel heard and be included in the discussion in order to develop support and buy-in as the project moves forward. Getting community agreement on a design that accommodates Towne Road will be particularly challenging. This is addressed in our approach to stakeholder input discussed below.

Tight Construction Window: There will be a need to degrade and rebuild within a single construction season (summer low-flow). This will require close coordination with the Corps to approve a realistic levee construction approach and schedule (GEI accomplished this with the Corps on the Bear River Setback). Accomplishing the project goal to construct during 2017 will require tight, on-time, highly efficient team performance in all aspects of the project.

Geotechnical (subsurface) Conditions Along the Setback Levee: Floodplains often consist of highly variable soft and pervious streambed deposits. While the Dungeness valley has a great deal of gravel and cobble all the way to the Strait of Juan de Fuca, the proposed setback levee is located in the lowest area of floodplain and there certainly will be pockets of softer fine sediment within the floodplain. Control of underseepage through the levee

foundation may require a cutoff wall, which would need to be constructed ahead of the embankment, adding to schedule pressures.

Liquefaction During a Seismic Event: Seismic issues for the levee design will be a focus for the Corps. Careful evaluation of seismic performance will provide an understanding of design requirements, which may include such elements as foundation treatment, slope reinforcement (geogrid), or stability berms.

Source of Borrow Materials for the Longer Setback Levee: The Corps' 10% design concept assumes that the existing levee material would be degraded and reused as the initial source of borrow for the new setback levee. However, additional levee fill material will be required to complete the new levee. Any potential to use materials excavated from other local projects would be explored. For example, borrow may be available from the City of Sequim's River Road storage project, if it is approved.

Towne Road Reconfiguration: Challenges include conflicts with recreation (trail) use and more robust design requirements if the road is placed on top of the new levee; subsurface and land use effects if placed outside the setback levee; and hydraulic effects and integration with the restoration design if placed within the restoration area. Considerations to be taken into account will be the road footprint, road elevation, effects on habitat area, needs for a maintenance road, and the possible use of the road placement on the levee to eliminate one of the primary mechanisms of levee failure – burrowing animals. We will seek stakeholder input with the goal of defining a preferred alternative early in the project schedule.

"Floodway gap" and Overlapping Levee Left in Place Along the River: The "floodway gap" and proposed new levee are well within the channel migration zone, where the river channel could easily move in the future. NSD had previously proposed to consider new channel anabranches in this area. Engineered logjams may be constructed to ensure habitat features are sustained while the riparian forest matures.

River Encroachment on the Levee: Channel migration against the levee could result in river contact with a featureless rock revetment lacking streambank trees. ELJs can create a channel migration limit inboard of the levee to ensure there is a long-term forested buffer between the levee and the river. It is best for the levee, the river and the fish to keep the channel away from the levee. This would also reduce project costs if a revetment is not needed along the entire levee alignment.

Sediment Dynamics: Levee setback in an aggradational environment could result in insufficient energy to move sediment through the system once the hydraulic constriction is removed. This could risk losing the channel, with attendant impacts on fish and other aquatic life. This risk will be addressed in our design.

Habitat "Scounting": The setback levee inevitably will have some impacts to jurisdictional critical areas. The key will be setting up a functional framework that allows us to take a net benefit approach with the enhancement of the floodplain within the levee.

Project Management Team: GEI will need to help the County balance and reconcile the potentially divergent priorities, preferences, and expectations of the primary stakeholders, including the Corps and the Jamestown S'Klallam Tribe. We will also need to support (and depend on) the Corps as it undertakes permitting and cultural resources work as needed.

Subcontractor Management: GEI offers several subcontractors. Based on our long experience with major project management, we do not view this as any different from the challenge of managing a large internal team, because the same keys apply in either situation: strong team communications and coordination tools such as a detailed work plan with clearly defined scopes, milestones, and budgets; the selection of team-oriented individuals who bring high professional standards; and long-established working relationships. These tools, this type of individual, and these relationships all characterize the GEI Team.

Stakeholder Input

Jeremy Pratt led watershed planning in WRIA 18 for more than 3 years and retains good knowledge of the community and stakeholders. Our capabilities are supported by Jeff Bohman, our local liaison, who has decades of experience on the North Olympic Peninsula, most recently as restoration coordinator for the National Park Service Elwha dam removal. We have attended DRMT meetings for much of 2015. GEI's community outreach team (Jeremy, Jeff and Sarah Brandt) will develop a stakeholder engagement strategy in close coordination with

Clallam County, building on past public involvement efforts related to the project. This will be a key element of the project Work Plan. The strategy will be anchored by a simple process roadmap defining project decisions that stakeholder input can influence. The roadmap will align community outreach against key milestones, deliverables, and decisions to be made. The strategy will also identify team roles and responsibilities, key messaging, opportunities and risks, and a clear media relations protocol.

We recommend establishing consistent communication via tools, such as a dedicated project website, project listserv, and direct mailings, and employing a more robust suite of forums and tactics at key milestones. Using both in-person and online tools – from community meetings to online open houses – will ensure convenient access to the process that meets diverse stakeholder needs. Well-timed presentations to the Dungeness River Management Team (e.g., to vet alternatives, and when a chosen integrated project design reaches the 65% stage, etc.) will effectively communicate with some of the most committed and concerned agencies, the Jamestown S’Klallam Tribe, NGOs, and other stakeholders.

To equip the team for success, the GEI Team will brief and prepare County staff and other partners who may represent the project in public or with the media, including rehearsing brief presentations and Q&A. Jeremy and Sarah can also provide team facilitation and recording at community meetings and agency/landowner briefings. For key public events such as open houses, the GEI Team will prepare visual, easy-to-understand materials like posters to depict alternatives and support wide review and input.

Task Dependencies, Schedule Milestones, and Constraints

Generally, we have clustered tasks into three groups for overall project planning. There are several chains of key task dependencies that run through these sequential lines of work:

Group 1: Tasks 1, 2, 11 – ongoing project planning. These overarching and ongoing tasks keep the project moving smoothly through the 15-month process and regulatory compliance (in support of the Corps). Initial project work, including the kickoff meeting and Work Plan will need to be accomplished immediately upon award. Project cost will be estimated and negotiated, and contracting completed at both the prime and subcontract levels. Landowner planning coordination, stakeholder risk analysis, and initial community outreach will begin as soon as possible, to support the development of workable solutions for the Towne Road reconfiguration. Initial progress on outreach will be critical to moving forward the road design alternatives analysis.

Group 2: Tasks 3, 4, 5, 6 – site analysis and alternatives development and vetting. Through this work we will develop sufficient site information to build a conceptual model of site constraints and likely responses (geomorphic, ecological, infrastructure) to support alternatives analysis. During this phase the Design Team will identify key linkages and potential problems and begin to rough out approaches to resolve them. These tasks culminate in selection of a preferred alternative, balancing the needs of the river, floodplain, levee setback, road, and community. The topographic survey and base map development will be completed at the onset of the project, as the topographic data is needed to inform most of the project evaluation and design efforts. Concurrently, any necessary land survey work necessary to provide the Design Team with accurate tools will need to expeditiously completed. Another early task will be evaluation of Towne Road reconfiguration alternatives within the overall restoration design. Towne Road alternatives will be vetted to seek agreement with the community, which will require event planning and public meetings (or other input strategies) and Design Team discussion to define linkages and highlight problems that require solutions. Completion of these tasks early in the project will provide the Design Team, community, and County (and its partners) with an understanding of the planned layout of the restored floodplain and reconfigured road, including vegetation type, cover, and features such as side channels and habitat structures. The floodplain layout concept has direct impact on the roughness factor used in the updated hydraulic modelling.

Geotechnical exploration and testing will begin early in order to collect the data needed to inform both the evaluation and design of the setback levee and the road reconfiguration. Geotechnical evaluation will start with an evaluation of work completed to date and then proceed in parallel with hydraulic modelling efforts, informing the layout and design of the setback levee, and beginning to define interactions among design elements. Hydraulic modelling will consider climate change effects and provide the water surface profile used to determine the required levee height along the setback alignment as well as any requirements for scour or erosion protection. Geotechnical evaluations will confirm design details of the levee including footprint, foundation preparation or treatment, and

slope inclinations. Project constructability will begin during the evaluation phase to ensure that design recommendations are feasible and cost-effective. Results of project analyses and constructability considerations will be documented and design recommendations incorporated into the milestone design packages. The Design Team will also initiate work early in 2016, and will immediately start an interactive, iterative process of identifying potentially workable design alternatives, defining linkages and feedback between them, and refining design concepts working toward 30% design. As soon as the land survey/base map, geotechnical exploration and hydrology, hydraulic and geomorphic analysis tasks are sufficiently advanced, the geotechnical, road, and restoration engineering analyses will be able to begin to incorporate input from community outreach, prioritize objectives, and work toward solving interactive problems where elements of these three design components affect one another.

Group 3: Task 7-10 – design phase. During this phase the preferred alternative will be articulated on the drawings and contract documents. Important objectives here are full collaborative integration of the various design elements to identify efficiencies, avoid gaps and overlaps, optimize construction and assure constructability. During this stage we will need to coordinate with the Corps on permitting. We believe that a realignment to a Corps levee requires a Major Section 408 permit, which typically require 12 to 18 months. Some Districts require 90% design to be completed for these permits; regulations require a minimum of 60% design. The project team will need the Seattle District Corps guidance on the timeline it expects to require for this permit. Moving forward, the Design Team will continuously identify linkages and requirements for integrated engineering solutions so that the levee, road and stream restoration elements are mutually supportive and do not have unintended deleterious effects on one another. A key schedule milestone will be the initial integration of all these elements in the 65% percent design. Assuming a 15-month schedule as defined by the RFP, key activities by month are shown in the table below. Critical milestones are highlighted in the table.

Month	Activities
January, 2016	Award, costing, complete contracting (prime and sub).
February, 2016	Kickoff, draft and final Work Plan and schedule, stakeholder risk analysis, landowner coordination planning, initiate Design Team (ongoing), conceptualize workable solutions across all design components (levee, road, restoration), initiate necessary land survey, draft base map, gather and begin review of existing information.
March, 2016	Reinitiate community outreach (ongoing), initial "listening" public meeting, right of way acquisition plan (as needed), complete team review of existing information, initiate geotechnical exploration and testing, finalize base map, develop initial Towne Road alternatives, initiate hydraulic and hydrologic (H&H) evaluation and analysis, initiate road and restoration design.
April, 2016	Develop outreach-ready discussion package of alternative options for community meeting, continue geotechnical exploration and testing, initiate geotechnical engineering analysis, begin iterative design integration, refine H&H analysis and modeling, begin to move alternatives analysis forward from concept level, define screening criteria, identify and begin to remediate data gaps.
May, 2016	Hold open house on alternative options, continue and refine geotechnical and H&H analysis, continue Design Team work to refine alternatives in iterative problem-solving mode using feedback on interaction of design elements among design components.
June, 2016	Draft geotechnical data report and review, draft H&H technical memo, begin to screen alternative options with County/Corps/Tribes and selected stakeholders, move road, restoration and levee design to 30%, develop draft preferred alternative, plan next outreach event.
July, 2016	Final geotechnical data report, final H&H memo, community outreach to present alternatives screening and gather input, Design Team concentrates on fleshing out the preferred alternative, County/Corps/Tribes review and approval of draft preferred alternative, refine preferred alternative based on review, plan next outreach event.
August, 2016	Community meeting to present preferred alternative, finalize agreement, initiate formal approval and permitting processes (Corps), initiate right-of-way acquisition.
September, 2016	Continue approvals and permitting, design team works toward completing 65% design. Complete approvals and permitting, review 65% design.
October, 2016	65% design plans, specs and estimate review by the approving jurisdictions. All environmental permits received. Right of way acquisitions complete.
November, 2016	Work on 95% design.
December, 2016	Review and complete 95% design.
January, 2017	Review and complete 100% design.

Month	Activities
February, 2017	Prepare final engineered sealed plans and bid documents. All construction permits obtained, with the possible exception of the Corps Section 408 permit (see discussion above)
March, 2017	Support bidder inquiry response upon receipt of Corps Section 408 approval.

QUALITY CONTROL (CRITERIA F)

The GEI Team will assure quality control through the implementation of their shared core business commitment to assure that quality is integral to all our work. As Design Manager, Alberto Pujol will exercise overall project quality control for the design package, supported by our independent review team. The Design Team senior engineers will cross-review and quality-control each design element. Because we and our principal subcontractors each operate in an environment in which we assume serious risk and liability, we each implement and meticulously adhere to strict review and quality control programs and procedures.

Project-specific QA/QC plans will be developed to provide guidance to the GEI Team and assure that work meets acceptable standards of quality (including client QA/QC requirements) throughout the life of the project. The QA/QC Plan communicates goals, responsibilities, and procedures to emphasize quality in all phases of the project. Quality control is integral, not an additional or optional service. The QA/QC Plan developed for the Lower Dungeness project will address the preparation, review, checking, documentation, and approval of all engineering work and deliverables as they progress, prior to submittal. Any deficiencies or inaccuracies will trigger immediate action to ensure the problem is corrected. The project QA/QC Plan will be incorporated as an attachment integral to our proposed Work Plan.

A. Independent Review/Constructability Review

GEI will assure quality through independent review conducted by highly qualified independent professionals: ERM (Mike Cox) will provide stream restoration design review, and KBA will provide levee design and constructability review. These reviewers will be charge of independently evaluating the project design for: technical approach; value engineering; constructability; and cost. GEI's constructability review team consists of senior engineers with levee and in-water project experience, who will review project progress and regulatory issues, evaluate value engineering opportunities, and identify cost efficiency opportunities, while providing input and guidance through each task and deliverable. We will perform constructability reviews at the design at 30, 65, and 90 percent design stages. We focus on clear and concise documents; coordination and consistency of plans, specs, and measurement of payment; physical conflicts; and design functionality.

Jeremy Pratt
Vice President

Project Role Project Manager



Jeremy Pratt has focused throughout his career on managing large-scale, controversial projects to resolve long-standing resource conflicts in complex regulatory environments. His unique ability to combine a multi-disciplinary planning and science background with skills in facilitation, regulatory compliance, and large project management keeps challenging projects on budget and on schedule. He seamlessly integrates environmental conflict resolution into project and process management to facilitate difficult multi-stakeholder projects to closure. His approach helps clients avoid unnecessary costs and has succeeded in moving forward projects that have sometimes been blocked for decades. Jeremy is a trained senior facilitator who has met the stringent requirements for listing on the U.S. Institute for Environmental Conflict Resolution National Roster.

For more than 35 years, Jeremy has led watershed and river management projects addressing stream corridor and watershed evaluation, planning, restoration and management in more than two dozen river basins throughout the west. He coauthored the Stream Corridor Inventory and Evaluation System (SCIES) for the U.S. Fish & Wildlife Service, a model that assists watershed managers in determining stream corridor values for fish and wildlife.

Jeremy has served as project manager and principal planner on a series of stream restoration plans and recommendations, sustainable use management plans, and carrying capacity evaluations of high-value river corridors under intensive use pressure. He developed long-term management plans and strategies for natural areas of outstanding quality to preserve river and wilderness values while maintaining high-quality recreational experiences, restore flow, resolve or minimize disputes, and reduce conflicts.

SELECTED PROJECT EXPERIENCE

Watershed Planning & River Basin Management

- WRIA 18 (Dungeness and Elwha Rivers) Watershed Plan – North Olympic Peninsula, Washington
- WRIA 46 Entiat/Mad River Instream Flows Facilitation – Entiat River Basin, Northcentral Washington (Entiat Planning Unit and Chelan Conservation District)
- WRIA 49 Watershed Level 1 Report – Okanogan River Basin, Northcentral Washington (Okanogan Planning Unit and Okanogan Conservation District)
- WRIA 15 Vashon Island Subbasin Watershed Plan –Vashon-Maury Islands, Washington
- WRIA 19 Watershed Planning Facilitation (Clallam County, Washington)
- WRIA 62 Pend Oreille Watershed Planning Level 1 Assessment and Plan Vision (Pend Oreille Conservation District)
- Okanogan Shoreline Management Program – Northcentral Washington
- Salmon Creek Stream Rehabilitation and Irrigation Water Supply (Bonneville Power Administration, Colville Confederated Tribes and Okanogan Irrigation District)
- Truckee-Carson River Basin Case Study (Bureau of Reclamation and Western Water Policy Review Advisory Commission), California
- Stream Corridor Inventory and Evaluation System (SCIES) (U.S. Fish & Wildlife Service)

EDUCATION

M.S., Environmental and Energy Studies,
Washington State University
B.S., Interdisciplinary Studies, The
Evergreen State College

EXPERIENCE IN THE INDUSTRY 38 years

PREVIOUS 10 YEARS EXPERIENCE

GEI: 2 years
Cardno ENTRIX: 13 years

TRAINING/CERTIFICATIONS

Senior Facilitator, U.S. Institute for
Environmental Conflict Resolution
National Roster, 2001

Certified Ecologist, Ecological Society of
America, 1987

- South Fork American River Management Plan – South Fork American River, California (El Dorado County, California)
- Green River Carrying Capacity Study and Management Plan – Green River, Utah (U.S. Forest Service)
- Upper Snake River Sustainable Management Plan (BLM)

WRIA 18 (Dungeness and Elwha Rivers) Watershed Plan – (Clallam County, City of Port Angeles, Jamestown S’Kallam and Lower Elwha Klallam Tribes, Dungeness Irrigators, 2001-2005) Project Manager, lead planner and facilitator for watershed assessments and Watershed Plans for the Dungeness and Elwha Rivers and two dozen smaller drainages comprising WRIA 18 on the North Olympic Peninsula, conducted for the Elwha/Morse Management Team and the Dungeness River Management Team. Facilitated more than 120 meetings over a three-year period for the two teams, providing process mapping, conflict resolution, and consensus-building. Addressed Dungeness River restoration goals; surface and ground water quantity and quality; water budgets for major service areas; water rights and the availability of water for appropriation; future water supply strategy; a sustainable development plan emphasizing conservation, protection of instream flows, irrigation reliability, water reclamation and reuse, limiting the proliferation of exempt wells; a plan for the regionalization of public water service in West WRIA 18; the establishment and operation of a groundwater reserve in East WRIA 18; septic system management; establishment of a Clean Water District and shellfish management; urban streams and stormwater management; salmon recovery and habitat restoration; instream flows; land use management in context of watershed planning; public education and outreach; and ongoing watershed management.

Salmon Creek Stream Restoration and Irrigation Water Supply (Bonneville Power Administration, Colville Confederated Tribes and Okanogan Irrigation District, 1998-2003) Led stream rehabilitation planning and evaluation of water supply alternatives serving both irrigation and instream flows. Identified options to restore flows and salmon passage in a dewatered reach, opening access to more than eleven miles of high quality habitat above the diversion dam. Facilitated Joint Committee of the Tribes and District planning process, evaluated a wide range of feasible alternatives for stream restoration design and irrigation supply to restore instream flows and anadromous salmonids to Salmon Creek.

San Clemente Dam Removal/Carmel River Restoration (California Department of Water Resources & San Francisco District Corps of Engineers – Carmel River, Monterey County, California (2004-2013)). Jeremy was brought into this complex, controversial project after two previous attempts had failed over disagreements on sediment management and dam removal. Led conceptualization of design alternatives allowing removal of an unsafe dam and restoration of salmonid access to about 16 river miles of mainstem Carmel River habitat upstream of the San Clemente reservoir. Identified a new consensus alternative that would reroute the Carmel River around a large volume of accumulated sediment, avoiding more than \$50 M in costs as well as severe impacts associated with sediment removal, while restoring the river to a free-flowing state and achieving strong agency, stakeholder and public support. Managed the preparation of a joint NEPA/SEPA compliance including consultation with NOAA Fisheries and U.S. Fish and Wildlife Service. Facilitated a core group of agencies and proponent representatives to identify acceptable alternatives and complete the NEPA/CEQA processes.

Truckee-Carson River Basin Case Study – Congress, Western Water Review Advisory Commission, and Bureau of Reclamation, 1997-2001) Policy review of all aspects of water resources development, management and allocation on the Truckee and Carson rivers over the past century for Western Water Policy Review Advisory Commission report to Congress on water policy in the west, analyzing lessons learned from the 80-year history of water conflicts in the Truckee-Carson River Basins. Included neutral situation assessment; analysis of the failure of regional water users to reach an accommodation with Newlands Project irrigators (who own key water rights); and failure of a Settlement Agreement between the Pyramid Lake Paiute Tribe and Sierra Pacific Water to assure drought supply to municipal purveyors while providing water for the recovery of endangered fish in Pyramid Lake and to restore the Lahontan Valley wetlands. A key outcome was to recognize the need for a collaborative, sustainable agreement that could be supported by all parties.

Alberto Pujol, P.E., G.E.
Senior Principal Engineer

Project Role **Lead Civil Engineer**



Alberto Pujol is a registered civil engineer with over 30 years of experience. He has been responsible for the planning, siting, evaluation, and design of a wide range of water resources projects as well as numerous projects involving the rehabilitation or replacement of existing infrastructure; including levees, dams, pipelines, roads, tunnels, and impoundments. Managing contracts with professional service budgets up to \$25 million, he has directed conceptual and feasibility engineering, planning and execution of investigations, development of construction plans and specifications, preparation of reports, and construction management. He has extensive experience in the supervision of multi-disciplinary teams of engineers and scientists, as well as a strong technical background with emphasis on solving problems and reducing costs.

Mr. Pujol has provided engineering support of construction operations for dams, power plants, and flood control projects, including temporary support of excavations, river diversions, cofferdam design, borrow area operations, material processing, dewatering systems, sediment control, and access roads.

PROJECT EXPERIENCE

Feather River Phase 4 Levee Repairs and Setback Levee, Three Rivers Levee Improvement Authority, Marysville, CA. Project Manager and Engineer-of-Record for \$200M project to remediate 13 miles of the left bank Feather River levee between the Yuba and Bear Rivers. The project involved strengthening of seven miles of existing levee, removal of six miles of existing levee, and construction of a new 5.6-mile-long setback levee. The levee strengthening program included levee raises, cutoff walls, waterside blankets, stability berms, and relief wells. The setback levee, now completed, incorporated 1.4 million square feet of cutoff wall, 3.6 million cubic yards of levee fill, and an interior drainage system including a 5-mile-long channel, 24 relief wells and a pump station. GEI performed planning studies, supported project permitting including USACE 408 approval, prepared preliminary and final designs, and provided construction management services.

Bear River Setback Levee, Three Rivers Levee Improvement Authority, Yuba City, CA. Project Manager and Engineer-of-Record. This project consisted of planning, investigating, designing, and constructing two miles of setback levee to increase the level of flood protection in southwestern Yuba County. The project included the removal of the existing levee and the riparian restoration of 600 acres within the new floodplain. GEI performed the planning studies, supported project permitting including USACE 408 approval, prepared the preliminary and final design of the setback levee and associated structures, and provided construction management services.

Green River Levee FEMA Accreditation, City of Kent, Kent, WA. Served as project manager for the evaluation, remediation design, and FEMA accreditation of two levee segments totaling approximately five miles along the right bank of the Green River south of Seattle, including evaluation of stability and seepage of levee and foundations, erosion and scour potential, design of levee remediation measures, and documentation to support

EDUCATION

M.B.A., Business Administration,
University of California
M.S., Civil Engineering /Geotechnical
Engineering, University of Wisconsin
B.S., Civil Engineering, Polytechnic
University of Madrid

EXPERIENCE IN THE INDUSTRY 34 years

EXPERIENCE WITH GEI 16 years

REGISTRATIONS AND LICENSES

Professional Geotechnical Engineer, CA
No. GE2072
Professional Civil Engineer, CA No.
C37051

PROFESSIONAL ASSOCIATIONS

American Society of Civil Engineers,
Member
International Society for Soil Mechanics
and Geotechnical Engineering, Member
United States Society on Dams, Member
Association of State Dam Safety Officials,
Member

FEMA accreditation of the levee system. Remedial measures include setback embankments and flood walls. Construction of retrofit measures is being completed in 2015.

Sacramento River East Levee Improvements, Sacramento Area Flood Control Agency, Sacramento, CA.

Project Manager for the geotechnical evaluation, remediation design, and FEMA accreditation support for 8.1 miles of levee along the left bank of the Sacramento River in Sacramento, including evaluation of stability and seepage of levee and foundations, existing utility penetrations, erosion and scour potential, design of levee remediation measures, and preparation of documentation to support FEMA accreditation of the levee system.

Natomas Levee Improvement Program Peer Review Services, Sacramento Area Flood Control Agency, Sacramento, CA. At the request of SAFCA, GEI performed an independent evaluation of a recently constructed levee along the left bank of the Sacramento River within the City of Sacramento. The regulatory agency with responsibility to approve the levee construction had issued SAFCA two Notices of Violation regarding some of the materials used to construct the levee. GEI performed an independent sampling and testing program to evaluate the levee materials and as-built conditions. As the Project Manager, led the investigation and documented the findings that the constructed levee met CVFPB permit requirements.

Urban Levee Evaluations-Feather River West Levee, California Department of Water Resources, Sacramento, CA. The Sutter-Butte Flood Control Agency (SBFCA) developed designs for the remediation of 44 miles of levee along the west bank of the Feather River north of Sacramento. Mr. Pujol was retained by DWR's Early Implementation Group to review the adequacy, appropriateness, and acceptability of the SBFCA designs for the purpose of assuring public health, safety, and welfare while maintaining a cost effective remediation approach.

Urban and Non-Urban Levee Evaluation Program, California Department of Water Resources, Statewide, CA. GEI is a key member of a team engaged the evaluation of 350 miles of urban levees and 1,250 miles of non-urban levees in California's Central Valley. Served as Task Manager for evaluation of the Marysville, American River, and West Feather River levee systems.

Levee Project Safety Assurance Reviews, US Army Corps of Engineers, CA. Served as the geotechnical reviewer on a panel of experts conducting Type II Independent External Peer Reviews (Safety Assurance Reviews) for ten USACE levee modification projects in Sacramento, Yolo and Napa Counties.

Upper Sand Creek Detention Basin, Contra Costa County Water Conservation Flood Control District, Antioch, CA. Project Manager and Engineer-of-Record for this 50-acre detention basin formed by construction of a dam designed to provide 100-year-flood protection and serve multi-use recreational and environmental purposes. The 40-foot-high earth dam and 1,000-acre-foot detention basin were completed in early 2014.

New Shoreline Levee Investigations and Design, Alameda County Public Works Agency, Oakland, CA. Project Manager for planning and design of six miles of new shoreline levees along the east shore of San Francisco Bay in Alameda County. The need for new flood protection facilities results from the ongoing restoration of a historic salt pond complex to tidal marsh and from higher tide levels and sea level rise. The project involves identifying feasible and cost effective levee alignments for implementation, evaluating alternative alignments, and developing engineering designs for the selected levee alignments.

SELECTED PUBLICATIONS

Pujol, A. et al. 2010. The Feather River Setback Levee, U.S. Society on Dams Newsletter, No. 152, Nov 2010.

Pujol, A. et al. 2010. Slurry Walls for Seepage Cutoff in Levee Applications – Recent Experience and Construction Challenges in the Northern Central Valley of California, presentation made to Deep Foundations Institute Technical Lectures Program on Use of Slurry Walls for Cutoffs, Sacramento, CA, July 2010.

James F. Nickerson, P.E.

Project Role Lead Geotechnical Engineer

James Nickerson is a WA state licensed civil engineer with 16 years of experience and a focus on geotechnical engineering. Mr. Nickerson's has been involved in the planning, evaluation, design, and construction of levee, floodwall and dam projects across the United States. Mr. Nickerson has recently completed several setback levee projects along the Green River in the City of Kent, WA. He has extensive experience completing geotechnical evaluations of levees including slope stability, seepage and settlement evaluations. Mr. Nickerson's experience includes planning and executing investigations, supervising engineering evaluations, preparation of reports, developing alternative analyses, development of construction plans and specifications, cost estimates and providing construction engineering and quality control and assurance.

PROJECT EXPERIENCE

Briscoe Desimone Floodwall Design, City of Kent, Kent, WA, 2012 – present). Served as the Project Manager and Engineer-of-Record for the design of a floodwall along the right bank of the Green River. The repairs included setting back the existing levee in three reaches by installing a steel sheet pile wall landward of the levee embankment then shifting the levee back from the edge of the riverbank. The combined length was about 3,600 linear feet. The design included a reinforced concrete cap beam and barrier at the top of the wall to provide flood protection to the 500-year flood level. The design also included the design of a dead man anchor system and soil tie backs along portions of the levee to provide lateral stability to support access ramps and closure structure.

Briscoe Desimone FEMA Accreditation, City of Kent, Kent, WA (2012). Served as the assistant project manager for the evaluation of the Briscoe-Desimone Levee evaluation for FEMA Accreditation. The project includes evaluating freeboard, embankment protection, closures, embankment and foundation stability, and settlement of the existing levee system. Work includes reviewing existing documents, record drawings, operation and maintenance manuals, performing confirmatory test borings and completing engineering evaluations to support the City's accreditation report submission to FEMA. Work also included providing preliminary design of sheet pile floodwalls to address deficiencies in four reaches of the levee.

Green River Levee FEMA Accreditation, City of Kent, Kent, WA (2011 – 2015). Served as the assistant project manager for the evaluation of the Green River Levee between SR516 and S231st Way for FEMA Accreditation. The project includes evaluating freeboard, embankment protection, closures, embankment and foundation stability, and settlement of the existing levee system. Work includes reviewing existing documents, record drawings, operation and maintenance manuals, performing confirmatory test borings and completing engineering evaluations to support the City's accreditation report submission to FEMA.

Flood Protection Conceptual Design, Tennessee Valley Authority, Various, TN (2012 – 2013). Served as the project manager and provided conceptual level design alternatives to provide flood protection systems around



EDUCATION

M.S., Civil Engineering, Worcester Polytechnic Institute (1999)
B.S., Civil Engineering, Union College (1997)

EXPERIENCE IN THE INDUSTRY
16 years

PREVIOUS 10 YEARS EXPERIENCE
GEI: 11 years

REGISTRATIONS AND LICENSES

Professional Engineer, WA No. 47996 (2011)
Professional Engineer, CT No. 26671 (2008)
Professional Engineer, IA No. 20253 (2010)
Professional Engineer, VA No. 0402037083 (2002)
Professional Engineer, MA No. 47761 (2010)

PROFESSIONAL ASSOCIATIONS

American Society of Civil Engineers
United States Society on Dams
Association of State Dam Safety Officials

AWARDS

Feather River Levee Repairs and Setback Levee, "Outstanding Flood Management Project 2010", ASCE, Region 9

Feather River Levee Repairs and Setback Levee, "Flood Control Project of the Year 2009", ASCE, Sacramento Section

Bear River Setback Levee, "Flood Management Project of the Year 2008", American Society of Civil Engineers, Region 9

Bear River Setback Levee, "Coast, Oceans, Ports, and Rivers Institute Award 2007", American Society of Civil Engineers, Sacramento Section

three existing nuclear power plants. Design alternatives included levee embankments, floodwalls, closure structures and pump stations. Developed conceptual level cost estimates for each design alternative.

Dubuque Levee and Floodwall System FEMA Accreditation, City of Dubuque, Dubuque, IA (2010). GEI Consultants performed an evaluation of the embankment and foundation stability for the city's Federal Emergency Management Agency Accreditation. The project, located along the Mississippi River, includes 7,100 feet of floodwall, 20,000 feet of earthen levee, a miter-gate closure into Dubuque Harbor, four pumping stations, and three primary flood detention ponds. Served as the lead geotechnical engineer for the evaluation of the Dubuque Local Flood Protection Project for FEMA Accreditation. The project, located along the Mississippi River, includes about 5 miles of earth embankment and about 1 mile of floodwalls, including T-wall and I-wall sections. The evaluation consisted of seepage and stability analysis of the earth embankment and floodwalls. Work included reviewing existing documents, record drawings, operation and maintenance manuals, performing confirmatory test borings and completing engineering evaluations to support the City's accreditation report submission to FEMA.

Levee Certification & Flood Control System, Town of East Hartford, East Hartford, CT (2008 – 2010). Completed an engineering study of the East Hartford Flood Control System to provide documentation that the system meets the design criteria specified in accordance with 44 CFR Section 65.10 of the National Flood Insurance Program. The study included evaluating existing documentation, site reconnaissance, a subsurface exploration program, and engineering evaluations of the 4-mile-long system. Serving as the Project Manager, his responsibilities include developing a subsurface exploration program, coordinating the riverside hydraulics and hydrology study, floodwall and closure structure evaluations, and embankment stability and seepage evaluations, settlement evaluations and review of the operations and maintenance manual. Mr. Nickerson also provided design services and served as the Engineer-of-Record for remedial measures where deficiencies in the flood control system were identified. Services included permitting, design drawings, construction contracts and specifications for sheet pile cutoff walls, soil-bentonite cutoff walls, floodwall and closure structure concrete repairs, riverfront bulkhead wall replacement, levee utility penetration abandonment, retaining wall replacement and renovations to mechanical/electrical/plumbing systems at the three pump stations.

Feather River Levee Repairs and Setback Levee, Three Rivers Levee Improvement Authority, Yuba County, CA (2006-2007). Project consisted of the evaluation of 14 miles of the east bank of the Feather River levee. Based on the evaluation, the repair project consisted of designing repairs to 8 miles of the existing levee and a 6-mile setback levee to replace a portion of the existing levee. Responsibilities included managing the subsurface exploration program consisting of conventional drilling, sonic drilling, cone penetrometer soundings, field vane shear testing, geophysics surveying, and a comprehensive lab testing program. All of the subsurface exploration data was managed with gINT software to reduce errors and allow quick visualization of the subsurface conditions. Served as the Project Geotechnical Engineer completing and managing the seepage, stability, settlement, and liquefaction evaluation for the existing levee and the proposed setback levee. Seepage evaluation included evaluation of underseepage and through seepage, and design of seepage mitigation measures including cutoff walls, seepage berms, and relief wells. Stability evaluation included the end-of-construction, steady-state-seepage and rapid drawdown cases, and design of stability mitigation measures including stability berms. Settlement evaluation included assessment of post-construction settlements and designing camber to provide adequate freeboard and berms to protect against longitudinal cracking due to differential settlements. Liquefaction evaluation included assessing the post-seismic deformations and quantifying the potential levee seismic vulnerability.

Bear River Setback Levee, Three Rivers Levee Improvement Authority, Yuba County, CA (2005). This project consisted of planning, investigating, designing and constructing two miles of levee to increase the level of flood protection in Yuba county and surrounding areas. Project consisted of the design of a 2-mile setback levee to replace the existing levee. Served as the Project Geotechnical Engineer completing and managing the seepage, stability, and settlement evaluation for the proposed setback levee. Seepage evaluation included evaluation of underseepage and through seepage, and design of seepage mitigation measures including cutoff walls, seepage berms, and relief wells. Stability evaluation included the end-of-construction, steady-state-seepage and rapid drawdown cases, and design of stability mitigation measures including stability berms.

Education

M.S. Civil Engineering, Colorado State University, 2006

B.S. Civil Engineering, Oregon State University, 2001

Employment History

Ayres Associates

Water Resource Engineer
2005 – 2008

GeoEngineers

Assistant Group Manager,
Senior River Engineer
2008 – 2012

Natural Systems Design, Inc.

Partner, Senior River Engineer
2012 – Present

Year of Experience

14 Years

Areas of Expertise

- River engineering
- Stream restoration engineering
- Engineered logjam design
- Culvert design for fish passage
- Hydraulic modeling (1-D and 2-D)
- Fluvial geomorphology
- Sediment transport modeling
- Scour analysis and scour countermeasure design
- Floodplain analysis and compliance
- Construction observation

Registrations

Registered Professional Engineer:
WA #45447, OR #70753,
CO #40696, WY 12789

Certified Floodplain Manager
#US-07-02961

Trainings

HEC-RAS River Analysis System
Environmentally Sensitive Bank Protection Design
RiverFlo2D Technical

R. Leif Embertson, PE, MS, CFM

Senior River Engineer

Project Role

Lead Hydraulic Engineer

Key Qualifications

Leif is a senior river engineer with truly unique experience in and knowledge of riverine and aquatic environments emanating from education, training, project experience, and extensive personal interest in the field. He is the lead design and hydraulic engineer for river-related projects such as bridge/culvert replacements, river and stream bank stabilization and restoration, engineered logjams, fish habitat improvements, 1- and 2-dimensional hydraulic modeling, fluvial geomorphic assessments, floodplain analyses, scour analysis, sediment transport analysis, and stable channel design. He was the lead river engineer for the Upper Dungeness River Restoration project that aimed to restore habitat complexity within anadromous reaches of the Greywolf and Upper Dungeness Rivers via the construction of logjams. As a professional engineer and avid whitewater kayaker, Leif spends his professional and personal time figuratively and literally immersed in the river environment. This combined technical and personal experience produces deep understanding of the fluidity, variability and complexity of long-term processes within aquatic systems that has served many clients well on projects across the western United States. He has shared his expertise by instructing other hydraulic professionals on the correct use and theoretical basis of HEC-RAS through the National Highway Institute and as a member of the Nooksack Salmon Enhancement Associate (NSEA) Board of Directors.

Project Experience

Upper Dungeness River Restoration, Jamestown S'Klallam Tribe, Sequim, WA. 2012-2013

Lead river engineer for a project that aimed to restore habitat complexity within anadromous reaches of the Greywolf and Upper Dungeness Rivers via the construction of logjams. Historical wood removal projects depleted large wood from these river reaches and degraded salmon and char habitat. NSD completed an evaluation of potential wood placement sites within a six-mile segment. Tasks completed by NSD included a basin scale characterization of watershed processes, hydrologic conditions, and sediment sources. Twenty-one sites were evaluated and prioritized based on geomorphic characteristics and potential biologic benefits. Desired elements of complex habitat include pools, stable salmon and char spawning habitat, side channels, and off-channel rearing habitat. NSD completed conceptual and final design of proposed structures in 2013. Construction of phase one of the project is anticipated for the summer of 2016.

Upper Quinault River Habitat Restoration, Quinault Tribe; Quinault, WA 2012-Ongoing

NSD team members have been involved with every phase restoration planning and implementation on the Upper Quinault that aims to restore natural processes across the entire alluvial valley. Tim Abbe, PhD began this work collaborating with the Bureau of Reclamation by leading a geomorphic analysis along 12 miles of the Upper Quinault River that established priorities, opportunities and constraints for a comprehensive restoration plan. The plan's primary focus was development of critical off-channel habitat for sockeye salmon in the Upper Quinault River. In addition, NSD project team members developed emergency and long-term engineering design guidelines for stable logjams and habitat. The plan was used as the basis for a programmatic permit to guide restoration and flood protection work within the Upper Quinault and provided a model for integrating science, emergency response, community relationships, and land management into an incremental, long-term approach to river restoration. Following this planning work Tim Abbe, PhD and Leif Embertson, PE, and have been involved with the design and construction of multiple ELJ projects within the Upper River including the Alder Creek Pilot Project, Project Area 5 and Jefferson County Reach.

Lower Elwha River Restoration, Lower Elwha Klallam Tribe; Port Angeles Washington. 2015-Ongoing

River engineer for a project in which a geomorphic assessment, preliminary design, hydraulic analysis, risk assessment, and construction plans was provided to the Lower Klallam Tribe to continue a long-term restoration project on the lower Elwha River. To reduce the immediate impacts related to removal of the Elwha River dams, NSD developed restoration designs involving the placement of multiple large engineered logjams (ELJs) in the lower Elwha River. ELJ work has been a crucial component of restoring the river's lower 3 miles prior to and following dam removal. Removal of the Elwha Dam was completed earlier this year and the Glines Canyon Dam is expected to be completely

gone sometime next year. NSD has completed design of the latest state-of-the art ELJ utilizing a "catchers-mit" approach to trap wood debris for the first phase of the project to be constructed in the fall of 2012. The new ELJ architecture accommodates over 90° changes in the direction of incident flow while retaining critical racked logs at the upstream face of the structure. The design also economizes the number of logs and uses the racked log piles to reduce the risk of scour compromising structural integrity. The structures were designed to withstand a 100-year flood and maintain pools while the river aggrades as a result of sediment release from the dam.

Orville Road Phase II Preliminary Design, Puyallup River; Pierce County Public Works, Orting, Washington. 2013 - Ongoing

Lead river engineer and project manager for a project in which designs for Phase 2 project actions utilizing a restorative flood protection approach were developed to protect Orville Road. Orville Road is a major arterial highway that crosses within the Channel Migration Zone of the Upper Puyallup River. A segment of the road was rebuilt following damages sustained by flooding in 1946 and a series of river training facilities including levees and revetments were constructed in the 1950s and 1960s to channelize the flow within a relatively narrow corridor and protect Orville Road from channel migration hazards. The levee system has sustained recurrent flood damages over recent decades; including full washouts at multiple locations in the project reach. The Phase 2 reach includes over 60 acres of disconnected floodplain area that has been isolated from the main channel by levees confining the Puyallup River. Phase 2 designs include a 3,500 foot long setback revetment parallel to Orville Road that will enable removal of the existing levees and reconnection of the isolated floodplain areas; thus achieving multiple objectives of road protection and enhancement of critical habitat for salmonids in the upper Puyallup River.

Barnaby Reach Geomorphic and Hydraulic Assessment, Skagit River, Skagit River Systems Cooperative, Rockport, Washington. 2013-2015

Lead river engineer and project manager for a project that aims to restore floodplain connectivity, natural processes, and off-channel rearing habitat in a reach in the Upper Skagit River near Rockport Washington. Within the Barnaby reach, the Skagit River has been simplified through the straightening of the main channel through its historic path and isolation of Barnaby Slough and Harrison Pond complexes from the main channel by constructed dikes and hatchery infrastructure. The project area is also subjected to a modified flow and sediment regime imposed by the Skagit River hydroelectric project (Gorge, Diablo, and Ross Dams). The goal of this project is to restore natural processes by removing artificial impediments to natural processes to allow the river to reclaim its dynamic behavior while ensuring adjacent private property and infrastructure are not adversely affected. As part of this project NSD performed a geomorphic assessment, 2-D hydraulic analysis using River-Flo2D on a 3.5 mile section of the river, a channel response analysis, a risk and benefit analysis of potential treatment actions, and development of a project description and budget estimate for the recommended treatment approach.



JOE MERTH, PE

Structural Engineer

Project Role

Lead Structural Engineer

Joe is a senior structural engineer and a certified bridge inspector with experience in bridge design and construction. While working at WSDOT, 16 of his 18 years there were spent in the Bridge and Structures Office. In this capacity, Joe had the opportunity to work on a wide variety of bridge structures and included all phases of development from conceptual design through construction. His experience includes the analysis and design of various bridge types, foundation analysis and design, seismic analysis and design, retaining walls, culvert design, sign bridge design, and load rating. Construction experience includes work as a bridge technical advisor and construction inspector. Joe is also skilled at providing constructability reviews, preparing cost estimates, developing specifications, performing value engineering studies, and coordinating with federal, state, and local agencies.

BS, CIVIL
ENGINEERING,
UNIVERSITY OF
MINNESOTA, 1991

24 YEARS OF
EXPERIENCE

EMPLOYMENT
HISTORY:

WA STATE DEPT OF
TRANSPORTATION 16
YEARS

PARAMETRIX 2009-
PRESENT

PROFESSIONAL
ENGINEER: WA,
#33224, 1996

Selected Project Experience

116th Street NE Interchange, 34th Culvert – Tulalip, WA

Client: Tulalip Tribes

Dates: 2008-2011

Joe was the lead designer providing engineering services for a complete reconstruction of the existing 116th Street NE Interchange over Interstate 5 (I-5), north of Marysville, WA. The improved interchange over I-5 provides additional capacity for planned growth in the north Snohomish County area, including the Quil Ceda Village Business Park located on the Tulalip Tribes reservation. The new design replaced an existing diamond interchange with a single point urban interchange. The new 2-span prestressed girder bridge is 160 feet long and 220 feet wide, accommodating 8 lanes. The preliminary design included several alternatives to obtain the most cost-effective configuration. The design also includes large retaining walls for the ramp structures and aesthetic considerations. Due to the number of stakeholders involved—WSDOT, FHWA, BIA, Snohomish County, the City of Marysville, Community Transit, and the Tulalip Tribes—close coordination and communication was required during the design phase.

SR 520 Bridge Replacement and HOV Corridor Program GEC – Seattle, WA

Client: HDR Engineering, Inc.

Dates: 2006-Present

Joe led the design for the widening of the existing SR 520 bridge west approach on Lake Washington in Seattle, WA. The approach widening is part of the SR 520 West Connection Bridge which will carry traffic from the existing approach to the new floating pontoons. The design involved a comprehensive analysis due to the complex geometry of the tapered widening, and required an unconventional prestressed girder superstructure with tapered sections and splayed girders. The 5-span widening required extensive seismic analysis to account for the inadequate seismic capacity of the existing structure. Since all of the construction occurs over water, drilled shaft foundations are used. Precast columns were provided in the design as an alternative to cast-in-place concrete in order to reduce form work and construction time.



Eastside Rail Corridor – Multiple, WA

Client: King County

Dates: 2014-Present

Joe developed preliminary planning-level estimates for retrofitting the Wilburton Trestle to accommodate non-motorized traffic. The Wilburton Trestle is a significant and highly visible portion of the proposed Eastside Rail Corridor. Originally constructed in 1904, the 980-foot timber trestle has been rehabilitated several times, most recently in 1943. In 1972, a steel plate girder section replaced approximately 100 feet of the trestle as part of the Lake Hills Connector Road widening. The estimates for accommodating non-motorized traffic included a precast deck alternative and a timber deck alternative. The estimates were summarized in a report that included recommendations for future inspection to further refine the cost figures.

Lake to Sound Trail Design – SeaTac, WA

Client: King County

Dates: 2010-Present

Parametrix worked with King County to assess the feasibility for a 16-mile trail connecting the south end of Lake Washington in Renton to the Puget Sound in Des Moines. They evaluated different routes for connecting existing and planned trails in five municipalities. Types of facilities considered included separated trail, rail with trail, and side path (trail within road right-of-way), bike lanes and sidewalk, and shared roadway. The feasibility study presented typical sections for these different facilities, identified goals and objectives, defined a regional trail, described the process for identifying alternatives, explained evaluation criteria, and provided planning-level cost estimates. As structural engineer, Joe provided an analysis for crossing the existing City of Renton Monster Road Bridge over the Black River. It was determined that the existing roadway bridge did not have sufficient capacity and could not be configured properly for non-motorized pedestrian traffic. An alternatives analysis determined that a new pedestrian bridge just upstream of the road bridge provided a better long term solution.

Stavis Bay Bridge Replacement – Seabeck, WA

Client: Kitsap County

Dates: 2009-Present

Joe was the lead designer for the NW Stavis Bay Bridge replacement and retaining wall project which spans over the confluence of Stavis Creek and Stavis Bay. It replaced an aging and structurally deficient timber structure and was lengthened to accommodate hydraulic and permitting requirements. Close coordination with permitting agencies was required to obtain environmental permits. The new bridge was centered along the same alignment as the existing bridge. In order to maintain traffic flow during construction, staged construction was used. The retaining walls included gabions and cast-in-place walls and woody debris was incorporated into the wall design to provide marine and fish habitat. In cooperation with Kitsap County, Parametrix provided a streamlined, efficient approach to the issues presented for this bridge replacement.

Donkey Creek Construction Services – Gig Harbor, WA

Client: City of Gig Harbor

Dates: 2011-2014

The Donkey Creek Bridge is a precast deck bulb tee girder structure recently constructed for the City of Gig Harbor. The single span bridge replaced an existing culvert, opening the creek to migrating salmon and allowing for tidal action. The 77-foot structure carries vehicular and pedestrian traffic and supports an extensive network of large and small utilities. Joe was the lead inspector for the initial inventory inspection and was responsible for creating a new database entry in BridgeWorks. Inspections adhered to WSBIS and NBI standards and the WSDOT Bridge Inspection Manual. Relevance to this contract: bridge inspection for a new precast structure, BridgeWorks input.

Education

Ph.D., Geology, Univ. Washington, 2000
M.S., Geology, Portland State Univ., 1990
B.S., Geology, Univ. of Vermont, 1984

Employment History Herrera Environmental

Senior Associate to Principal
2002-2007

ENTRIX

Vice President
2007-2012

Natural Systems Design, LLC,
Partner, Principal Geomorphologist
2012 – Present

Year of Experience

28 Years

Areas of Expertise

- Fluvial & coastal geomorphology
- Hydrology & hydraulics
- Sedimentology & sediment transport
- Channel migration zone delineation
- Engineered log jam design
- Road and pipeline assessment & protection
- Natural hazard risk assessment
- Watershed assessment
- Sustainable land management
- Restorative flood and erosion protection
- River & coastal restoration

Registrations

Registered Geologist, CA, 1992, #5500
Registered Geologist, OR, 1992, #G1351
Professional Engineering Geologist, WA, 2002, #1151
Professional Hydrogeologist, WA, 2002, #1151

Related Experience

Ranger, U.S. National Park Service, AZ and WV, 1984-1985

Hydrologist, U.S. Army Corps of Engineers, Portland, OR, 1986-1989

Hydrologist, Philip Williams & Assoc., San Francisco, 1989-1992

Research Assistant, Univ. of Washington, Seattle, WA 1992-2000

Senior Associate, Philip Williams & Assoc., Seattle, WA 2000-2002

Principal, Herrera Environmental Consultants, Inc., Seattle, 2002-2007

Vice President, Cardno Entrix, Inc., Seattle, WA 2007-2012

Lecturer, Earth and Space Sciences, Univ. of

Tim Abbe, PhD, PEG, PHG

Principal Geomorphologist

Project Role

Lead Fluvial Geomorphologist

Key Qualifications

Dr. Abbe is an internationally recognized geomorphologist and licensed professional engineering geologist and hydrogeologist with 28 years of applied science and research experience in geomorphology, environmental assessment, habitat restoration, risk assessment, self-mitigating flood and erosion protection, sustainable land management, and water resources. Dr. Abbe has led over 100 restoration projects in Washington, Oregon, Idaho, California, and Alaska. Dr. Abbe has been working on the Olympic Peninsula since 1992 and on the Dungeness River since 2003 when he did a channel migration assessment of the Trestle Reach. He led design of the successful placement of engineered logjams in the Dungeness Trestle Reach (2006-2008). He also led the hydraulic and geomorphic assessment and preliminary design of the Lower Dungeness Towne Road levee setback project. While at NSD Dr. Abbe and Mr. Embertson designed the Upper Dungeness River Restoration project, which is scheduled for construction in 2016. Dr. Abbe He has conceived and pioneered engineered logjam technology for river restoration. His environmentally sensitive levee protection designs have been successfully tested. The American Public Works Association awarded his Pierce County Orville Road protection design a 2014 Transportation Project of the Year. In 2015 he completed a FEMA funded comprehensive flood hazard assessment of the Upper Sandy River for Clackamas County. The County has retained NSD to move forward with a restorative flood protection design in 2016 that provide an environmentally sensitive model for FEMA. Dr. Abbe's work is cited and used all over the world to better understand and restore rivers. In addition to acting as Chief Operating Officer for NSD, he manages the Port Angeles office.

Project Experience

Principal in Charge - Upper Dungeness River Restoration, Jamestown S'Klallam Tribe, Sequim, WA. 2012-2013

Dr. Abbe led the geomorphic assessment and ELJ design for a project that aims to restore habitat complexity within anadromous reaches of the Greywolf and Upper Dungeness Rivers via the construction of logjams. Historical wood removal projects depleted large wood from these river reaches and degraded salmon and char habitat. NSD completed an evaluation of potential wood placement sites within a six-mile segment. Tasks completed by NSD included a basin scale characterization of watershed processes, hydrologic conditions, and sediment sources. Twenty-one sites were evaluated and prioritized based on geomorphic characteristics and potential biologic benefits. Desired elements of complex habitat include pools, stable salmon and char spawning habitat, side channels, and off-channel rearing habitat. NSD completed conceptual and final design of proposed structures in 2013. Construction of phase one of the project is anticipated for the summer of 2016.

Principal in Charge - Sandy River Phase I Flood Erosion Hazard Study and Restorative Flood Protection Projects – Clackamas County Emergency Management, OR. 2014-2015

Dr. Abbe led the basin scale watershed and geomorphic assessment to characterize flood erosion hazards of the upper reaches of the Sandy River most recently impacted by the January 2011 disaster flood event. A primary task of Phase I is the identification of key mitigation sites for flood storage, restorative flood protection and habitat friendly stabilization design. With this study, the County and the Sandy River Basin Council (SRBWC) will correlate their goals for flood protection and relief, and habitat restoration for the Upper Sandy River. In addition, NSD is currently working with the SRBWC on the Restorative Flood Response Design project, which is the pilot project for Clackamas County officials and SRBWC and the Upper Sandy River community. As part of the project, NSD was contributing author to the "Restorative Flood Response Handbook" to educate the community about risks associated with river processes.

Principal in Charge Restoration of the Lower Elwha River, Clallam County, WA 1999-2016

Dr. Abbe has worked with the Elwha Tribe for 17 years to restore the Lower Elwha River. His work focused on the re-introduction of stable logjams to the river and removal of old "sugar" dikes has helped to restore critical salmonid habitat before and after the removal of the Elwha and Glines Canyon Dams. Over 50 engineered logjams have been built in the lower Elwha where they have been instrumental in creating and sustaining pools and cover for juvenile and adult salmonids. The logjams have directly helped the river's food web by trapping nutrients and boosting invertebrate populations. Dr. Abbe's work also included detailed two-dimensional modeling to evaluate how the ELJs could impact flood stage and the federal levee. His designs balanced habitat restoration with protecting the levee and the local community. Dr. Abbe and Mr. Embertson are currently leading designs for the lower mile of the Elwha River immediately upstream of the Strait of Juan de Fuca.

Principal in Charge - Upper Puyallup River Reach Assessment and Orville Road Protection Design Phase A, B, and C, Pierce County Public Works, WA. 2013-Ongoing

Dr. Tim Abbe, P.E.G., and NSD staff continues to assist Pierce County Public Works on a corridor assessment of the Orville Road along the Upper Puyallup River that began while he was at a previous firm. After Orville levee washed out in the early 1990s, Pierce County decided to begin a program of levee setbacks in the Upper Puyallup. Channel migration still threatened important infrastructure like the Orville Road. Dr. Abbe led a comprehensive analysis of the river to evaluate erosion and flood hazards and developed a self-mitigating solution to protect Orville Road. Dr. Abbe led technical analysis that included fieldwork, 1-D and 2-D hydraulic modeling, sediment transport, and wetland and fisheries assessments working with Pierce County staff. Dr. Abbe's design was applauded by NOAA, WDFW, Puyallup Tribe, Muckleshoot Tribe and others as a restorative means of protecting the road. The American Public Works Association awarded the first phase 2014 Transportation

Washington, 2010-present

Vice President and Partner, Natural Systems Design, Inc., Seattle, 2012-present

Project Awards

American Public Works 2014

Cardno Entrix Innovation Award 2011

SGA Environmental Excellence 2009

ACEC Gold Award, 2004

Professional Affiliations

American Geophysical Union

American Society of Civil Engineers

American Fisheries Society

Geological Society of America

Project of the Year.

Principal Geomorphologist – Upper Quinault Valley Restoration for Quinault Indian Nation, Jefferson County, WA. 2005 - Ongoing

Dr. Abbe began working on the Quinault River in 2004 and authored one of the most comprehensive valley scale restoration plans done in Washington State. The plan set a framework on which approximately ten million dollars has been spent since 2008. Together with Mr. Embertson, Dr. Abbe has led on-going restoration efforts within the Upper Quinault, working closely with the local community. Under NSD's leadership, restoration of the Upper Quinault has won the support of local residents, regulatory agencies, and funding organizations. The NSD team regularly attends public meetings and built years of trust with the local community in balancing restoration of the river and floodplain with protecting infrastructure and property.

Principal Geomorphologist - Thornton Confluence Restoration, Pierce County, WA. 2009-2014

NSD led a five-firm team through the preliminary engineering and detailed design of the restoration of the confluence of the north and south branches of Thornton Creek, on the most productive salmonid habitat in the City of Seattle. The project site is surrounded by residential properties, municipal facilities and roadways, has multiple utilities crossing through the site including sewer mains, stormwater mains, gas and water and is located in a low-gradient area that was formerly wetland. The 6-acre project consists of expanding a 3-acre stormwater management facility, re-constructing over 1,000 ft of channel and installing a new 30-ft span culvert under an arterial roadway. Over 160 logs were installed within the channel to create spawning and rearing habitat for chinook and coho salmon as well as resident cutthroat trout and peamouth, while also allowing large amounts of incoming sediment and debris to transport through the system and relieve localized flooding. The pond dredging and expansion was completed in 2013 and the stream was restored in 2014 at a combined cost of approximately \$7 million through issuance of two separate construction phases.

Principal in Charge - Neadham Road Infrastructure Protection Project, Pierce County Public Works and Utilities, Water Programs Division, Pierce County, WA 2012 - 2015

Dr. Abbe and team members from a Seattle engineering firm were contracted by Pierce County Public Works and Utilities, Water Programs Division to design and assist in the Phase I installation of ELJs as part of the solution to levee washouts that threaten local residences and infrastructure on the Upper Puyallup River. A washout in the winter of 2009 destroyed several hundred feet of the Neadham Road levee along the river's right (east) bank. The project included four ELJs to form riverward habitat and erosion protection along the new setback levee. The major components of Phase II of the project included a geomorphic assessment of the reach including channel dynamics, wood debris, and flooding; HEC-RAS modeling to predict water depths and velocities needed for design of flood protection and mitigation measures. The project goals include inhibition of channel migration zone expansion that threatens public infrastructure and where possible, restoration of habitat complexity lost from historic channelization.



Steve Winter, PH & PWS

Restoration Ecologist

Project Role
Lead Ecologist

EDUCATION

M.S., Hydrologic Sciences, University of California – Davis

B.S., Geography and Anthropology, University of Oregon

17 YEARS EXPERIENCE

Employment History:

ESA (Adolfson Associates) 2006-Present

CERTIFICATION/REGISTRATION

Professional Hydrologist (PH) # 09-H-190

Professional Wetland Scientist (2610)

PROFESSIONAL AFFILIATIONS

American Institute of Hydrology

Society of Wetland Scientists

Steve is a restoration ecologist who is dedicated to supporting the implementation of complex, multi-benefit, restoration projects at scales that make a difference in our watersheds. Steve's work has focused on understanding the important feedbacks between aquatic ecosystems and physical processes to implement restoration projects that function with ongoing dynamic physical processes. Steve's involvement in restoration projects often focuses on establishing restoration goals and objectives that capture the suite of ecological goals for these projects to key them firmly in mind throughout the design process. Steve has prepared plans, specifications, and estimates for stream and wetland restoration projects in freshwater, riverine, and estuarine settings. Steve strives to apply his knowledge of key ecological and geomorphic processes to implement projects that result in complex and self-sustaining ecosystems.

Relevant Experience

Maynard Shoreline Restoration, Discovery Bay, WA. Project Manager. ESA, supported the North Olympic Salmon Coalition complete final restoration plans to maximize ecological benefits and engage dynamic nearshore processes along a highly altered portion of Discovery Bay. This shoreline includes an abandoned railway berm and remnants from past land use as a timber mill. The ESA team collected site specific information including topographic survey of the project site and data collection from reference beaches that informed a robust feasibility analysis to develop and analyze restoration alternatives. The design alternatives considered a number of stakeholder considerations, including a private waterline, a future Olympic Discovery Trail alignment, and Olympia oyster beds that occur within the project area. ESA supported communications with stakeholders to arrive at the preferred restoration alternative that included a re-route of the proposed trail alignment to facilitate achieving ecological goals for the project. Steve managed this effort, and led the development of the plans, specifications, and cost estimate, as well as construction oversight.

Owuloolt Restoration Project, Marysville, WA. Technical Support. ESA supported the Tulalip Tribes with permitting and design of a 370 acre intertidal restoration project in the Lower Snohomish Estuary that was completed in 2015. The Owuloolt Estuary Restoration project team includes the Trustees (Federal and State Agencies members), the Corps of Engineers, and the Tulalip Tribes. Steve provided technical support throughout the project, sheparding the project through including the development of restoration concepts, throughout the permitting process, and completing design drawings. Starting in 2007 portions of Allen and Jones Creeks were re-aligned and the linear ditch system filled to set the stage for tidal reintroduction. Steve is assisted with permitting, and developed final design of the internal project elements, including berms, new channels and channel connections, and trail and drainage improvements.

Sauvie Island Wetland Restoration and Enhancement Project. *Technical support.* ESA along with project partners PC Trask and Associates and the Columbia River Estuary Study Taskforce (CREST), are providing assessment, hydrodynamic modeling, alternatives analyses, and conceptual design services for the Sauvie Island Wetland Restoration and Enhancement Project. The project is located at the existing ODFW wildlife refuge intends to restore an accessible mosaic of tidal wetland habitats conducive for juvenile salmonids, waterfowl, and other priority species while reducing operational costs associated with intensive management. A major project goal is to reduce the dominance of reed canarygrass and restore a wapato dominated swamp to replicate conditions witnessed by Lewis and Clark. Steve developed a geomorphic assessment for the site, used elevation-vegetation relationships to develop design parameters, and supported the development of final restoration plans for Phases 1 (Ruby Lake) and 2 (Millionaire and Deep-Wigeon Lakes). Phase 1 was completed in 2013, and Phase 2 will occurred in 2014, and Phase 3 was completed in 2015.

Padden Creek Estuary Restoration, Bellingham, WA. *Technical Support.* ESA, along with subconsultants Coastal Geologic Services and Herrenkohl Consulting, is supporting the City of Bellingham develop a restoration approach for the Padden Creek estuary. More than a century of development on the Bellingham waterfront has reduced the Padden Creek estuary to a small portion of its historical extent. The ESA team is developed a suite of restoration actions for the estuary intended to increase habitat complexity and riparian condition. Key issues for this project include the potential for substantial areas of contaminated sediments, a highly urbanized site context, and the physical and geomorphic constraints of the site. These alternatives were developed within the current context of the site, and include a longer term vision for the estuary as existing infrastructure is replaced or upgraded. Steve supported all phases of the project including final design and construction supervision.

Shell Mitigation Telegraph Slough Conceptual Design, Anacortes, WA. *Role.* Conceptual design and project description for the restoration of a levee setback project to establish tidal marsh and mudflat near the mouth of Telegraph Slough in Padilla Bay. The restoration serves as mitigation for work undertaken at the adjacent Shell refinery. Steve supported the field reconnaissance and is currently developing the ecological and geomorphic targets for restoration of the site.

Puget Sound Nearshore Ecosystem Restoration Project (PSNERP) Nearshore Restoration Conceptual Design Projects, Puget Sound, WA. *Technical Support.* ESA is currently supporting the PSNERP project by preparing conceptual restoration designs for more than 40 Puget Sound nearshore restoration activities. PSNERP is a large-scale initiative that is being developed by a joint entity composed of the USACE and Washington Department of Fish and Wildlife (WDFW) and other government organizations, tribes, industries, and environmental organizations focused on restoring nearshore ecosystems in Puget Sound. Steve developed conceptual designs for five actions, ranging from removal of a relict road embankment in Budd Inlet to reactivating the western portion of the Nooksack Delta. These designs included descriptive text, plan views, sections, and preliminary estimation of quantities.

James Wengler

Project Role Professional Land Surveyor

PROFESSIONAL EXPERIENCE BIOGRAPHY

James has over 30 years' experience as a Professional Land Surveyor in Clallam County, including the Clallam County Geometric Framework, which is a comprehensive resurvey of approximately 200 sections within Clallam County. It included the measurement of approximately 1150 geodetic and cadastral monuments by employing GPS and traditional terrestrial traversing methods and recording approximately 800 surveys which established and or recovered right-of-way, property and easement lines.

Project Experience

Since 1997, Wengler Surveying and Mapping has been involved with topographic surveying and mapping for river and stream restoration projects for Clallam County in care of Jobs For the Environment administered by Joel Freudenthal, Habitat Specialist.

These projects initially required the establishment of both horizontal geodetic control and vertical control monuments along the Dungeness River, Bell Creek, Morse Creek and the Clallam River for the purpose of producing detailed topographic surveys of the project sites.

These control points were used to map critical components of the rivers or creeks. Including but not limited to the lines of ordinary high water, thalweg, centerline, vegetation lines, tree species, utilities and other features to produce a detailed topographic survey of Bell Creek and the Clallam River. Detailed topographic work was not performed on the Dungeness or Clallam Rivers after initial recognizance was performed.

In addition, we worked with Jay Peterson, PE of 4 Seasons Engineering, on the Elwha River from 2001 through 2004. This work entailed detailed mapping of the Elwha River for the use in design of engineered log jams. Follow up included mapping of the log jams and changes to the river.

Other stream mapping projects included the mapping of Thompson Creek for the Suquamish Tribe. This project entailed integrating photogrammetric mapping with traditional land based mapping for engineering design and construction use. This project also included merging survey data from different sources into a new surface model.

As a managing partner of the North Olympic Partners, we completed the Clallam County Geometric Framework. This was a comprehensive resurvey of approximately 200 sections within Clallam County. It included the measurement of approximately 1150 geodetic and cadastral monuments by employing GPS and traditional terrestrial traversing methods. This project produced 21 records of survey and is being used as the framework for the County's Geographic Information System (GIS). The horizontal datum, Washington State Plane Coordinate System, North Zone and the vertical datum NAVD 1988 as established by the CCGF will be used for this project. It is the basis of most boundary and topographic surveys performed in the County today.

EDUCATION

SUNY College of Environmental
Science and Forestry Syracuse NYS
Ranger School
AAS-Forest Technology 1978

AFFILIATIONS & REGISTRATIONS:

- Professional Land Surveyor, State of Washington License #26304, July 1989
- Certified Federal Surveyor Certification Number 1059, February 2007
- Appointed by the Governor to the Board of Registration for Professional Engineers & Land Surveyors, September 2014
Expires July 2019
- Land Surveyors' Association of Washington, Surveyor of the Year 2006
- Land Surveyors' Association of Washington, State President 2000
- Member: Land Surveyor's Association of Washington
- Member: National Society of Professional Surveyors

I began surveying in Clallam County in 1979. After the required 10 years experience I sat for and passed the Land Surveyors Exam and received my license in July of 1989. When the company I worked for moved to Seattle I opened my own office in 1996 and have recorded almost 800 Records of Survey, Short Plats, Plats , and Large Lot Subdivisions

Since acquiring my license in 1989 I have traveled to Olympia numerous times as a subject matter expert to help the Board of Professional Engineers and Land Surveyors (BOR) write and evaluate the Professional Land Surveying exam. This entailed actually taking the PLS exam in order to evaluate the questions for ambiguities and relevance. In addition to this, I was appointed to a 30-member team of subject matter experts from across the United States. This team traveled to Clemson, South Carolina and Atlanta, Georgia to take, evaluate and determine the minimum passing score of the National Professional Land Surveyors exam administered by the National Council of Examiners for Surveying. I have had articles published in professional journals and have given seminars on various surveying topics. In 2007 I was asked to be a beta test member for the Certified Federal Surveying (CFedS) program. After obtaining my federal certification I was the first to perform a survey, Land Description Review (LDR) and Chain of Surveys (COS) certifications in the country and the first to perform a Federal Authority survey in Washington State. From February 2000 to February 2001 I was the President of the Land Surveyor's Association for the State of Washington. I served as the NSPS Governor and Director for Washington State and the BOR liaison for the State of Washington. I am currently serving on the Board of Registration for Professional Engineers and Land Surveyors.



HAPPY LONGFELLOW, PE

Transportation Engineer

Project Role

Lead Transportation Engineer

Happy has over twenty years of experience in project management, program and project planning, project budgeting and funding identification, geometric design, plans, specifications, and engineer's estimates of probable construction costs (PS&E) for trails, local roads, and highway projects in rural and urban areas. Happy leads and/or supports multi-disciplinary teams on multi-jurisdictional projects through their full life cycle of planning through design, permitting, and construction. Happy manages planning, environmental and design projects; facilitates public meetings; prepares council briefings; leads workshops; and develops stakeholder support. Happy's technical work includes conceptual design, alternatives development, channelization design, roadway design, earthwork design, right-of-way plan revisions, survey coordination, utility conflicts resolution, construction staging design, temporary traffic control design, and drainage design. In addition, he has worked on feasibility reports, hydraulic reports, stormwater site plans, value engineering studies, construction plans, contract specifications, construction cost estimates, and construction inspections. He also conducts Quality Assurance reviews on technical work and Quality Control reviews of deliverables.

BS, CIVIL
ENGINEERING,
UNIVERSITY OF
WASHINGTON, 2003

22 YEARS OF
EXPERIENCE

EMPLOYMENT
HISTORY:
PARAMETRIX 13
YEARS

PROFESSIONAL
ENGINEER, CIVIL, WA,
#37902, 2001

Selected Project Experience

Olympic Discovery Trail (ODT) – Sequim, WA

Client: Jamestown S'Klallam Tribe (JST)

Dates: 2008

ODT and Lower Campus Parking Lots: Happy served as the project manager and provided engineering for this project that included construction of two new paved permanent parking areas near the Lower Campus along Old Blyn Highway. Project elements included the construction of 2,000 feet of 10-foot-wide paved trail, a 26-stall one-way parking lot and a 30-stall parking lot. The design work included designs for grading, paving, drainage, sidewalk, trail, retaining walls. We also provided design services during construction by the JST's construction company, Jamestown Excavating. Unique project details included conducting a value engineering study on the stormwater treatment BMPs designed by others, assumed the role of engineer when the previous engineer was no longer able to complete the project, prepared regrading designs for the parking areas, trail, and walls to further reduce construction costs, and provide onsite support when field conditions didn't match the surveyed surfaces. This project was funded with ARRA, BIA and tribal funds.

ODT Extension Heron Hall to Blyn Road: Happy was the project manager and provided engineering for this project that included construction of ODT along an out of service railroad grade adjacent to Old Blyn Highway from the Tribe's Heron Hall north to Blyn Road intersection. Project elements included the construction of 3,000 feet of 10-foot-wide paved trail. The design work included grading design, drainage design and design services during construction by JST's construction company, Jamestown Excavating. Unique project tasks included micro designing the trail profile to minimize the grading footprint on the former railroad grade in order to keep construction costs down and avoid impacts to adjacent wetland and stream and buffer impacts, thereby reducing costs and environmental impacts and construction schedules. This project was funded with ARRA, BIA and tribal funds.



Chicken Coop-Zaccardo Road Realignment – Blyn, WA

Client: Jamestown S’Klallam Tribe

Dates: 2011-2014

Happy is the project manager for this project that improved safety by combining two sub-standard intersections into one safer intersection with US 101. Parametrix was responsible for design, permitting, and engineering for the project including Clallam County road realignment, highway turn lanes, lighting, and storm drainage treatment. The project also involved two stormwater conveyance systems, two treatment facilities, and a stream relocation. The stream relocation includes design of a new stream reach and its associated culvert to provide flow beneath the new Zaccardo Road crossing. Parametrix staff applied land use expertise to delineate complicated existing basins and document the intricate runoff area swaps between threshold discharge areas (TDA). The Hydraulic Report used figures to clearly depict how the project used an equivalent areas swap between TDAs to exceed minimum runoff treatment and flow control requirements. Using LID design expertise, Parametrix designed two compost amended biofiltration swales achieving enhanced runoff treatment. To benefit both the local ecosystem and the tribal client, the facilities were sized to exceed minimum treatment requirements while providing a cost-effective treatment option. Providing enhanced treatment to new and existing non-treated highway runoff improves the ecosystem because it reduces levels of dissolved copper and zinc discharged to the streams. The client benefit came through cost savings because the CABS design is more cost effective compared to providing basic treatment and paying into the DOT runoff treatment retrofit fund. Additionally, Parametrix designed the temporary erosion and sediment control (TESC) and prepared the construction stormwater pollution prevention plan (CSWPPP) for this project.

Old Blyn Hwy Traffic Calming – Sequim, WA

Client: Jamestown S’Klallam Tribe

Dates: 2012-2013

Happy was the project manager and engineer for this roadway safety project designed and constructed in two phases for the Jamestown S’Klallam Tribe. This safety project provides traffic calming measures along a mile of Old Blyn Highway, a Clallam County road, through the tribal campus area. This project included pavement reconstruction, pedestrian crossings with actuated Rapid Flashing Warning Lights, re-channelization of the roadway to collect stormwater, stormwater treatment systems with vegetated rain gardens, street lighting, landscaping, curbing, additional signing, restriping, temporary traffic control and temporary erosion and sediment control plans. This project was funded with BIA TTP money, as well as tribal funds.

East Interchange on US Highway 101 – Sequim, WA

Client: Jamestown S’Klallam Tribe

Dates: 2006-2010

Happy was the project manager for this project. The Jamestown S’Klallam Tribe proposes to develop the interchange on US 101 near the intersection of Old Blyn Highway and East Sequim Bay Road. The project goal was to provide better connections with the East Sequim Bay Road and Old Blyn Highway from US 101 in Clallam County, Washington. The project area along this thoroughfare presents many challenges as the right-of-way is very constrained along the highway at the head of Sequim Bay near development and environmentally sensitive areas. The project improves connections to US 101 in the Sequim Bay area. In order to accomplish this, trips destined for US 101 will be given better access to the highway thereby reducing trips thru the Tribal areas along Old Blyn Highway. These improvements will enhance mobility and safety as economic development continues in the area. The intent of creating a new interchange with a connecting road through the reservation area is to accommodate this development safely. This includes consideration of a roundabout in lieu of a proposed four-leg intersection as well as additional access management strategies that will further enhance mobility and safety along the highway and through the reservation. As project manager, Happy assisted the Jamestown S’Klallam Tribe with the design of a new US 101 E. Sequim Bay Road interchange including Clallam County road realignment connections with US 101 as well as channelization improvements on the highway itself. Project work includes managing the planning, alternatives development, screening, design, right-of-way acquisition, and environmental assessment. Future phases of work may include final design, PS and E, and construction management. Key roles include coordination with stakeholders (BIA, WSDOT, and Clallam County), supporting funding pursuits, managing staff, and managing the scope, schedule and budget. Funding sources include BIA IRR, HPP, and tribal hard dollars.



enviroissues

Sarah Brandt

senior associate

Project Role

Co-Lead Community Outreach

Sarah has more than 15 years of experience developing and implementing communications plans for dozens of projects, and has authored in-depth policy and program analyses. She draws on her strong background in environmental science, public policy, and technical facilitation to help her clients meet their communication objectives, often about complex subject matter. For the SR 520 Bridge Replacement and HOV Project, Sarah developed and leads the communications strategy to implement a Memorandum of Understanding between WSDOT and the City of Seattle, including frameworks for staff, executive, and elected official engagement supporting project implementation. Sarah has managed and facilitated communication efforts at the federal, state, and local levels and has been trained in group facilitation methods and participatory strategic planning.

Education

Harvard University | B.A.,
Environmental Science and Public Policy,
1998

Certifications

Institute of Cultural Affairs | Group Facilitation
Methods, 2001, Participatory Strategic Planning,
2002

**International Association of Public
Participation** | Public Participation Certificate,
2012

Key Project Experience

SR 520 Bridge Replacement and HOV Project Westside Communications

Management *Washington State Department of Transportation, 2007 – 2015*

Managed outreach and communications to improve safety and mobility of the State Route 520 corridor within the City of Seattle. Currently providing strategic advice related to government relations and environmental, design and outreach communications activities. Helped convene, facilitate and provide strategic oversight for multiple stakeholder processes, including:

- A robust westside community design process involving the Seattle Design Commission, City Council, and several city departments.
- Executive and staff-level coordination meetings between WSDOT and City of Seattle staff, in compliance with an established Memorandum of Understanding.
- A Regulatory Agency Coordination process with project regulators and partners to accelerate the environmental permitting process.
- Developing a Community Construction Management Plan, an innovative approach to construction management that aims to minimize public impacts through robust community engagement, and to manage public expectations through a suite of communications tools.

WRIA 8 Watershed Strategy Planning and Technical Facilitation *King County Water and Land Resources Division, April 2015 – Present*

Prepared for and facilitated the Water Resource Inventory Area (WRIA 8) team's strategic retreat to identify the best approach to updating the 10-year salmon recovery plan. Worked with the watershed coordinator to refine the agenda, interviewed each team member to inform the workshop and ensure that collective objectives would be met, facilitated the workshop, and developed a summary capturing action items, next steps, and an initial approach to updating the plan to be detailed and vetted with the watershed's Salmon Recovery Council. As part of implementation, planned and facilitated a basin-wide technical forum to inform plan revisions.

Implementation Strategies *Puget Sound Partnership, 2013 – Present*

Facilitated three stakeholder processes to develop Implementation Strategies to accelerate eelgrass, shellfish beds, and estuary recovery in Puget Sound. Worked with lead agencies to structure processes that engage diverse participants in developing these innovative test-case strategies focused on key Vital Signs for Puget Sound recovery. In addition, she facilitated broad stakeholder workshops to review and refine each strategy, developed components of each strategy's narrative, and helped write a guidance document for those preparing future Implementation Strategies.

Snohomish River Basin Salmon Conservation Plan *King and Snohomish Counties, 2003 – 2005*

Sarah led public outreach for the Snohomish River Basin Salmon Conservation Plan, supporting the Snohomish Basin Salmon Recovery Forum's development of recommended actions and sub-basin strategies. Through this effort, Sarah gained a strong understanding of the challenges, stakeholder interests, regulations and policies that set the context for salmon recovery. Sarah served as the technical writing lead for the plan, which won an Honor Award from the American Planning Association/Planning Association of Washington in the Partnering Plans category.

Tolt River Levee Setback and Salmon Habitat Project *Seattle City Light, 2005 – 2007*

Seattle City Light and King County undertook this project in a voluntary effort to enhance salmon habitat in the Lower Tolt River. As project manager, Sarah's responsibilities included planning for and managing all logistics for public meetings, maintaining a contact database, developing graphics, and developing and distributing public information materials, including news releases, fact sheets, PowerPoint presentations, public meeting advertisements, and project website updates.

Water Quality Standards Public Outreach and Education *Washington State Idaho Department of Environmental Quality, 2004 – 2006*

Developed public education and outreach materials to help Idaho DEQ inform internal staff and the public about Water Quality Standards (WQS) under the Clean Water Act. Tasks included: (1) Writing issue papers to help the public understand key WQS issues to facilitate DEQ's triennial review process; (2) Developing a presentation and summary of antidegradation policy and implementation in Idaho; (3) Creating a framework to organize Idaho's Continuing Planning Process into a publicly understandable online and paper-based educational module, (4) Organizing and facilitating a three-city teleconferenced "Temperature Summit" to solicit stakeholder feedback on DEQ's revision of temperature standards, and (5) Interviewing water quality experts in several other western states to help inform DEQ's ongoing temperature criteria rulemaking efforts.



Jeremy Pratt
Vice President

Project Role Co-Lead Community Outreach



Jeremy Pratt has focused throughout his career on managing large-scale, controversial projects to resolve long-standing resource conflicts in complex regulatory environments. His unique ability to combine facilitation skills within his multi-disciplinary planning and science background seamlessly integrates environmental conflict resolution to bring difficult multi-stakeholder projects to closure. He has succeeded in moving forward projects that have sometimes been blocked for decades. Jeremy is a trained senior facilitator who has met the stringent requirements for listing on the U.S. Institute for Environmental Conflict Resolution National Roster.

For more than 35 years, Jeremy has led watershed planning and water resource management projects addressing stream corridors and watersheds in more than two dozen river basins throughout the west, providing restoration plans and recommendations and sustainable use management plans and developing long-term management strategies to resolve disputes and build consensus in a wide variety of natural resources projects.

Jeremy has handled all aspects of public outreach planning, event management, and media relations for projects as diverse as the Skagit River Wintering Bald Eagle Studies, Okanogan Shoreline Management Plan Update, San Clemente Dam Removal/ Carmel River Restoration and WRIA 18 Watershed Plan. He assists decision-makers and stakeholders to collaboratively understand and act on complex, long-term resource challenges. He is committed to collaborative, inclusive process in which there is full participation, mutual understanding, and shared responsibility. He helps groups develop shared frames of reference and come to workable, sustainable solutions. Jeremy's strengths are his abilities for facilitative listening, accurate recording of group process, and a sharp sense for where and how stakeholders can come to consensus. His ability to hear and frame themes helps groups understand one another and recognize potential solutions. An excellent communicator, Mr. Pratt has honed skills over more than three decades in which he has developed and led citizen's advisory groups for public agencies, conducted public meetings and agency consultations, managed media relations, and represented programs, projects, and proposals before legislative committees, local government, and the public at large.

EDUCATION

M.S., Environmental and Energy Studies,
Washington State University
B.S., Interdisciplinary Studies, The
Evergreen State College

EXPERIENCE IN THE INDUSTRY 38 years

PREVIOUS 10 YEARS EXPERIENCE

GEI: 2 years
Cardno ENTRIX: 13 years

TRAINING/CERTIFICATIONS

Senior Facilitator, U.S. Institute for
Environmental Conflict Resolution
National Roster, 2001

Certified Ecologist, Ecological Society of
America, 1987

SELECTED FACILITATION & OUTREACH EXPERIENCE

WRIA 18 (Dungeness and Elwha Rivers) Watershed Plan (Clallam County and Initiating Governments) – North Olympic Peninsula, Washington (2001-2005). Conducted process mapping and facilitation for two parallel watershed planning teams, through a three-year consensus-based process to develop the Dungeness and Elwha Watershed Plans. Facilitated about 120 meetings of planning teams that engaged several dozen stakeholders representing two tribes; an irrigation association of nine member districts and companies; Clallam County; the Cities of Port Angeles and Sequim; state and federal agency representatives; and numerous citizen caucuses representing a range of interests from property rights to environmental advocacy.

San Clemente Dam Removal/Carmel River Restoration (California Department of Water Resources & San Francisco District Corps of Engineers – Carmel River, Monterey County, California (2004-2013). After two previous attempts to complete NEPA and CEQA failed over disagreements on sediment management and dam removal, Jeremy developed a consensus alternative that broke the impasse allowing dam removal and river restoration opening 11 miles of upstream habitat. Cooperating Agencies included NOAA Fisheries and U.S. Fish and Wildlife Service. Consensus allowed an unsafe dam to be removed and the river to be restored with broad agency, stakeholder and public support. Developed and led all aspects of public involvement.

Salmon Creek Stream Rehabilitation and Irrigation Water Supply NEPA EIS (Colville Confederated Tribes and Okanogan Irrigation District) – Salmon Creek, Northcentral Washington (1998-2004). Facilitated a proactive partnership between Tribes and irrigation district to both protect irrigation service and restore flows to a reach of Salmon Creek dewatered by irrigation diversions for more than 80 years. Facilitated the planning process and alternatives evaluation, achieving a systems understanding of the instream needs and irrigation water requirements, fisheries biology and stream geomorphology. A key outcome was agreement on a water supply program that paved the way to fund stream rehabilitation for salmon recovery.

Okanogan Shoreline Management Program (Okanogan County) – Northcentral Washington (2006-2008).

Responsible for all aspects of public involvement and facilitation; integration of science and public involvement; process road-mapping; development of stakeholder and technical advisory groups; and meeting facilitation over a three-year public process. Developed ground rules, caucus groups and conducted in-depth stakeholder assessment to identify interests and framework to address the full range of issues.

Enloe Hydroelectric Project FERC License Application (Okanogan Public Utility District) – Similkameen River, Washington (2005-ongoing). Resolution of conflicts over fish passage, aesthetic flows, sediment contamination, and land management allowed project to be accepted by FERC for licensing, survive legal challenges, and receive a new 50-year license.

WRIA 46 Entiat/Mad River Instream Flows Facilitation (Entiat Watershed Planning Unit) – Entiat River Basin, Northcentral Washington (2003-2006). Facilitated a series of workshops to reach consensus on instream flows for Entiat and Mad Rivers among a diverse group of landowners, orchardists, state and federal agencies, local government and tribes. Overcame sharp differences to address both minimum instream flows (regulatory flows conditioning new water rights) and target flows for recovery of listed salmonids. Consensus was achieved ahead of schedule and the Jeremy continued to facilitate on a water reserve and trust water agreement.

WRIA 19 Watershed Planning Facilitation (Clallam County) – Northwest Olympic Peninsula, Washington (2003-2004). Intervention to facilitate conflict resolution in a planning unit that had become riven with conflict to organize itself, define its scope of work, and move forward with its primary mission

WRIA 62 Level 1 Assessment and Plan Vision (Pend Oreille Watershed Planning Unit) – Pend Oreille, Washington 2003-2006. Facilitated visioning process to identify issues of concern and prioritize actions for watershed planning involving local landowners and property rights advocates, timber, agriculture, Forest Service, Washington Department of Fish and Wildlife, Seattle City Light, Pend Oreille PUD, and the Kalispell Tribe.

Truckee-Carson River Basin Case Study (Reclamation and Congress) – Western Nevada and Eastern California (1998-2001). Situation assessment conducted for the Western Water Policy Review Advisory Commission, investigating decades-long unresolved water conflicts and lessons learned in the basins. Advised Congress and the Commission on unresolved critical water-related problems, including a Settlement Agreement between the Pyramid Lake Paiute Tribe and Sierra Pacific Water, failure to reach an accommodation with Newlands Project irrigators, and a new Truckee River Operating Agreement.

Okanogan and Methow Subbasin Planning (Okanogan County, the Colville Confederated Tribes, and Washington State agencies) – Northcentral Washington. (2003-2006). Develop and implement intensive public outreach program; liaison to habitat technical teams in the Okanogan and Methow basins.

Skagit River Wintering Bald Eagle Advisory Team Facilitation (Seattle City Light) – Skagit River, Washington. Facilitated a multi-stakeholder Bald Eagle Advisory Team guiding studies on the effects of a proposed hydro project on Skagit River wintering bald eagles (one of the largest concentrations in the U.S.).

Dungeness Comprehensive Irrigation District Management Plan (CIDMP) (Forest Service, NMFS, Fish and Wildlife Service, Jamestown S'Klallam Tribe) – Dungeness River and Sequim-Dungeness Valley, Washington. (2003-2005) Formed and facilitated monthly meetings of the Technical Advisory Team to complete the initial steps of the CIDMP to help irrigation districts reach implementation agreements with federal agencies for Endangered Species Act and Clean Water Act compliance.

Resource Use Conflict Evaluations [National Park Service (Zion National Park), U.S. Forest Service (Green River Flaming Gorge), Bureau of Land Management (Upper Snake River), and El Dorado County, California (Lower American River)] – (1988-1997). Led in-depth situation assessments of conflicts among resource users in river basins and National Park of remarkable recreational quality and values. Developed long-term management strategies to resolve or minimize disputes.

Mike Cox, P.E.

Role: Independent QA/QC



Mr. Mike Cox is a Partner within ERM based in Livingston, MT. He has 19 years of environmental engineering related experience. His engineering background includes water resources, environmental risk assessment, site assessment, and geotechnical investigations. He has performed a variety of water resources and water management projects for Industry and Government clients all across the United States and Africa. Mike has applied his knowledge on both conventional and unconventional resource projects.

Mike's water resources engineering experience includes: stream restoration design, sediment transport, aquatic habitat enhancement, hydraulic analysis, surface water modeling, fish passage assessment & design, floodplain studies, hydrologic assessments and engineering analysis, bank stabilization and migration, scour analysis, water quality studies, ice flow monitoring, and ice jamming evaluation.

Mike's water resources background includes water supply, water disposal analysis, alternative use, water balance determination, stormwater engineering, runoff analysis, reuse and recycling support, stakeholder engagement, permitting and regulation support, water treatment assessment, future and projective use analysis and predictive modeling, and irrigation supply.

Professional Affiliations & Registrations

- Alaska Professional Engineer, CE 10574
- Idaho Professional Engineer, CE 13102
- Montana Professional Engineer, CE 16910
- North Dakota Professional Engineer, Pending
- Washington Professional Engineer, CE 44362
- Wyoming Professional Engineer, CE 11972
- NRCS Technical Service Provider, TSP-06-5507

Fields of Competence

- Stream Restoration & Flood Mitigation
- Hydrology and Hydraulics
- Surface Water Modeling
- Cold Regions Hydrology
- Floodplain Analysis and Delineation
- Fish Passage Assessment and Design
- Industrial Water Use Analysis
- Water Management and Risk Assessment

Education

- Graduate Studies, Arctic Engineering, University of Alaska Anchorage
- B.S. Geological Engineering, University of Idaho, 1996

Languages

- English, native speaker

Key Industry Sectors

- Oil and Gas
- Mining
- Power
- Government

Key Projects

Restoration

Blacktail Deer Creek Flood Conveyance Analysis and Stream Restoration Design, Beaverhead County. Project Manager and Senior Engineer

Provided urban stream restoration design of Blacktail Deer Creek. Designed the stream to convey 50 year flood flows, provide aquatic habitat, transport sediment and minimize the potential of ice induced flooding. Performed hydraulic analysis necessary to size hydraulic structures capable of passing the 100 year discharge.

Fleshman Creek Stream Restoration, Flood Mitigation, Recreation & Fisheries Enhancement, and Water Quality Improvement. Park County and Federal Emergency Management Agency. Project Manager and Senior Engineer

Conducted an urban restoration design project on a 2.7 mile reach of Fleshman Creek. Developed a design to minimize flooding of the Yellowstone River overflow channel by creating a urban recreation amenity and enhancing fish habitat. Prepared engineering design drawings, assisted with permitting, developed engineers cost estimate, and provided construction administration services. Established goals for the project included improve water quality; increase in-stream water quantity; and restore the degraded riparian and aquatic habitat associated with the creek

Upper Big Hole River Schindler Reach Restoration, Natural Resource Conservation Service. Senior Engineer

Provided hydraulic analysis and restoration design support of approximately 3,500 lineal feet of the Upper Big Hole River. Conducted sediment transport analysis and prepared construction cost and material estimates.

Mission Creek Channel Relocation, Natural Resource Conservation Service. Senior Engineer

Assisted with stream relocation design of a 2,500-foot reach of Mission Creek. Rectified agricultural related channelization activities that have significantly altered the channel function and aquatic habitat. Identified restoration alternatives, flood frequency and channel hydraulic analysis, characterization of a reference reach, design of bank stabilization treatments and bed armor, floodplain grading, wildlife species inventory and habitat assessment.

Trail Creek Restoration, Natural Resource Conservation Service. Senior Engineer

Provided design support and engineering review of a 2,300-foot reach of Trail Creek through a failed reservoir basin. Addressed multiple impacts to the system including a deeply entrenched straight channel through the lake basin. Established a new channel at the historic floodplain elevation. Identified restoration alternatives, flood frequency and channel hydraulic analysis, characterization of a reference reach, design of bank stabilization treatments and bed armor and floodplain grading.

Stream Restoration Design Services, LP, PacRimCoal, LP. Senior Engineer

Conducted conceptual stream restoration design and baseline fisheries services related to permit applications associated with the proposed Chuitna Coal Mine. Prepared a stream restoration/reclamation plan including the conceptual design of 10.8 miles of anadromous stream. Provided plan and profile sheets and construction details for several Rosgen stream types. Initiated sediment sampling program and transport analysis.

Poorman Magnetite Mine Restoration Design Services, Eagle Industrial Minerals. Project Manager and Senior Engineer

Conducted conceptual stream restoration design services related to permit applications associated with the proposed Poorman Magnetite Mine. Prepared a stream restoration/reclamation plan that consisted of relocating three anadromous streams. Provided preliminary design drawings for both permanent channel relocation and temporary diversion alternatives.

Fish Enhancement Mitigation Plan, PacRimCoal, LP. Senior Engineer

Provided conceptual engineering design services and habitat assessment in support fish habitat permit. Delineated habitat features, established proposed mitigation ratios and prepared proposed construction sequencing.

Profile

Years of Experience:

20 years total

Education:

M.S., Civil Engineering (Water Resources), University of Washington, 2005

M.S., Engineering Management, Missouri University of Science and Technology, 2000

B.S., Civil/Environmental Engineering, Seattle University, 1995

Licenses and Certifications

Registered Professional Engineer, State of Washington, #41421, 2004

Project Management Professional Certification, PMI, #1264827, 2009

Project Types:

- Military
- Marine/piers
- Water resource management
- Levees
- Buildings

Technical Expertise:

- Construction management
- Office engineering
- Strong leadership
- Planning and development

Summary of Qualifications

Kevin has over 20 years of experience planning, designing, constructing, operating, and managing a wide variety of complex projects. In addition to his leadership skills, Kevin possesses exceptional talents as a project and construction manager. Prior to joining KBA, Kevin served as an engineer officer in the U.S. Army, including eight years working with U.S. Army Corps of Engineers (USACE) Districts in Europe, the Middle East, and Seattle. In his recent role as Deputy Director of the Seattle District, Kevin oversaw staff responsible for supporting a \$650 million annual program of construction and engineering services throughout the Northwest region. During this time, he served in key roles during responses to flood events and other natural disasters, including serving as the District Engineer. Kevin also worked on various levee construction, planning studies, and flood control projects for the Continuing Authority Program and General Investigation studies; and has experience overseeing flood teams performing pre-flood planning and preparation activities, emergency response and coordination during flood events, and post-flood inspection and damage assessment. In other roles, Kevin has led multi-disciplined teams for a variety of construction projects and programs, to include a highly visible \$30 million joint headquarters campus in Germany and a \$500 million construction program in Iraq and Kuwait. Moreover, Kevin has a proven history of teaming and leading to deliver high-quality projects within schedule and budget in the most demanding environments.

Relevant Professional Experience

U.S. Army (Active Duty Officer) (1995-2015)

Executive Director (Deputy Commanding Officer), 555th Engineer Brigade; Joint Base Lewis-McChord, WA (2014-2015)

Kevin served as a senior executive for a multi-disciplined engineering organization of nearly 2,000 military and civilian employees, with four divisions capable of rapidly deploying to conduct construction and support operations globally. He directly supervised engineering design, survey, and construction management teams, as well as departments responsible for providing safety, administrative, human resources, facilities, operational, and logistical support to the entire organization. Kevin also personally directed key programs and initiatives that increased personnel readiness, as well as programs to manage, recruit, and develop talent.

Regional Director, USACE Gulf Area Military Construction Program; Iraq and Kuwait (2013-2014)

Kevin served as Regional Director for the Corps of Engineers' Gulf Area Office, where he led a cross-functional team of engineers, managers, and staff in the delivery of a highly visible \$500 million construction and engineering services program throughout the countries of Iraq and Kuwait. Kevin oversaw all construction operations and engineering services for strategic partners in the U.S. Departments of State and Defense, as well as the Iraqi and Kuwaiti Ministries of Defense. During this time, Kevin served as the lead engineer providing critical engineering services and led the delivery of multiple challenging design-build military construction projects including a \$23 million project to design and build a 400-meter naval pier with associated river dredging, and a \$37 million project to construct a low-water river crossing with associated road connections. During this time, he directed a staff of 50 personnel in five project offices, and managed a \$10 million annual operating budget.

Deputy Director, USACE Seattle District; Seattle, WA (2011-2013)

Kevin directed the District Headquarters' staff responsible for supporting an organization consisting of over 1,000 people with a \$650 million annual program of engineering services, construction, and water resource management operations throughout the Northwest region. In this capacity, Kevin served as Chief of Staff during the District's responses to natural disasters, and chaired the District's Safety Board to evaluate operations on all active construction projects. During his tenure as Deputy Director, Kevin oversaw multiple flood teams performing pre-flood planning and preparation activities, emergency response and coordination during flood events, and post-flood inspection and damage assessment.

Chief of Staff and Operations Director (Battalion Executive/Operations Officer), 2nd Brigade/10th Mountain Division; Fort Drum, NY (2009-2011)

Kevin was a senior engineer responsible for organizational facilities and construction portfolio. He provided construction management services for a 3,500+ person organization on seven remote sites while deployed overseas. He led an integrated staff in an organization consisting of five divisions responsible for construction, facilities, environmental health and safety, administrative and logistical support, and developed the budget for the entire organization. Kevin directed operations and led the organization's planning processes. He developed organizational plans, policies and procedures, and managed a professional development program to mentor and develop unit leadership and organizational staff.

Construction Project Engineer, Resident Engineer, and Deputy Area Engineer, USACE Europe District; Germany (2005-2008)

Kevin served as a Lead Project Engineer for 38 construction projects worth over \$148 million, ensuring each met design, quality, budget, safety, and schedule specifications. He administered over 20 contracts, and managed numerous contract modifications and value engineering proposals. During this time he led teams of engineers, designers, and construction management specialists on a variety of projects; one of which supporting FEMA's Hurricane Katrina recovery mission, where he developed and implemented a wood debris reuse plan that saved the U.S. Government well over \$40,000 in material handling, transportation, storage, and disposal fees. Kevin also led a multi-disciplined engineer team as Resident Engineer of a field construction office in Iraq, where he successfully managed a \$100+ million program while ensuring design, quality, budget, safety, and schedule specifications on 25+ projects. For his last 18 months in Germany, Kevin was selected over his peers to serve as the District's only Deputy Area Engineer, providing direct oversight on key projects for the Region's Senior Engineer. In this capacity, Kevin led a design and construction management team on the critical \$30 million joint headquarters complex for the U.S. Department of Defense's Africa Command in Stuttgart, Germany, which received an award for the District's best project in 2008.

U.S. Army Engineer Officer; Various U.S. and Overseas Locations (1995-2005)

Kevin served in progressively more complex and challenging operational leadership and supporting staff positions. His responsibilities included planning, implementing, and assessing programs and processes to support safe and efficient operations; applying program management best practices; and utilizing data, trends, and assessments to support implementation of new strategies to resolve challenges and effect change. Kevin's positions required strong teaming, organization, communication, and project leadership skills, and the ability to effectively analyze complex information and develop materials and recommendations for leadership. Additionally, Kevin attended the Army's basic, intermediate, and advanced officer leadership training courses.

Jeffrey R. Bohman
Bohman Resources



Jeff Bohman has over 35 years' experience in Natural Resource, Conservation and Environmental Management and Planning, Parks and Recreation Management, Fisheries and Wildlife Issues, Long-range Planning, Regulatory Compliance, Public Policy Formulation, Research, Public and Constituent Relations, Negotiation, Advocacy, and Non-Profit Organizational Management and Development.

More than 16 of those years have been devoted to watershed management, water resources, restoration and related activities on the Dungeness and Elwha rivers in eastern Clallam County. Jeff brings to the GEI team a deep and wide personal and professional familiarity with these rivers and the local communities. In particular, that experience has focused on the watershed planning conducted in WRIA 18 and on many aspects of actual project implementation that has ensued.

Jeff has also led a variety of public planning and communication processes in Clallam County over the past 25 years. These have included processes associated with watershed planning, dam removal and river restoration, and recreational trail planning and implementation.

EDUCATION

BA Environmental Biology
University of Colorado, Boulder, CO

EXPERIENCE IN THE INDUSTRY

25 years

PREVIOUS 10 YEARS EXPERIENCE

National Park Service, Olympic N.P.,
Elwha River Restoration Project:

8 years

Entrix Consultants,
WRIA 18 Watershed Mgmt. Plan:

2 years

SELECTED PROJECT EXPERIENCE

Watershed Planning & River Basin Management

Project Management Specialist, Elwha River Restoration Project

National Park Service, Olympic N.P., Port Angeles, WA June, 2005 – January, 2014

- Lead responsibility for developing, coordinating, and fully implementing a diverse group of restoration and construction projects to mitigate the sedimentary and hydrologic impacts of Elwha River dam removals. Projects emphasized coordination with multiple jurisdictions and private property owners, often with divergent interests. Mitigation actions primarily addressed impacts of future flood and groundwater level rises. Implementation actions included a wide range of legal agreements and settlements, property purchases, and easement transactions, design and construction of major infrastructure projects, and substantial financial negotiations. Responsible for projects and settlements totaling in excess of \$5 million.

Project Scientist

Entrix, Inc, Branch Office, Port Angeles, WA October, 2002 – June, 2005

- Lead responsibility for independent research, analysis, and writing for a diverse range of environmental projects in watershed and land use planning, project planning and compliance, habitat restoration, and NEPA/SEPA processes. I managed selected projects, including budget management, agency and expert consultation, and coordination of professional teams of consultants. Principal projects included the WRIA 18 (Elwha-Dungeness) Watershed Management Plan, the Eighth Street Bridges Replacement Project, and statewide Habitat Conservation Plan (for WA Dept. of Natural Resources).

Program Manager, Watershed Planning Program

Clallam County, Port Angeles, WA April, 2000 – October, 2002

- Full management responsibility for comprehensive watershed planning process for WRIAs 19 & 20 in western Clallam County, encompassing five major and many minor watersheds and over 1,000 square miles on the northwest Olympic Peninsula. Represented and worked on behalf of eight local governments including four tribes, two counties, one city, and a utility district. As the sole staff, I was responsible for all aspects of the program. This included coordinating the intergovernmental

management of the planning process, developing the public information and public involvement activities that were an integral part of the process, and managing the wide range of technical data gathering, research, and analysis on which the plan was being built.

Director, Natural Resources Division (Elwha River Restoration Office)

Lower Elwha Klallam Tribe, Port Angeles, Wa August, 1993 – July, 1996

- Directed staff of eight and budget of over \$700,000 in work on nationally significant project of Elwha River dam removal, river and fisheries restoration and land management as well as land use planning, water quality, environmental health, transportation, and other tribal objectives. Selected and managed consultants/contractors in a wide array of legal, scientific, technical and other disciplines. Directed public relations and media activities. Represented Tribe and coordinated with elected officials, agencies, interest groups and the public. Directed tribal involvement in EISs and other legal, legislative and technical processes.

Manager, Division Of Water Quality

Clallam County, Port Angeles, WA August, 1990 – April, 1993

- Created, hired staff, developed work programs and fully managed and administered professional planning team of five staff plus interns and volunteers. Responsibilities focused on developing short and long-range citizen-based plans to reduce and eliminate non-point pollution from watersheds and then implementing those plans. Was responsible for grant and contract development, budget management, staff supervision, project management and direction of consensus-based citizen planning process.

DAVID K. SHREFFLER

Shreffler Environmental
3890 Lost Mountain Road
Sequim, Washington 98382-7925
Bus. 360-582-1712
Cell 360-477-2558
E-mail: lostmtnloft@olympus.net

EDUCATION

B.S. Zoology, Duke University, 1985
M.S. Fisheries, University of Washington, 1989

QUALIFICATIONS

Mr. Shreffler's primary areas of interest and expertise are fisheries biology, nearshore ecology, and restoration of riverine, estuarine, and marine habitats. Over the past 26 years, Mr. Shreffler's research has focused on evaluating and restoring riverine, estuarine, and marine ecosystems, planning salmon recovery at the landscape scale, reviewing and evaluating environmental restoration projects from around the U.S., and performing field investigations throughout Puget Sound. He has lived on the Olympic Peninsula since 1990 and has intimate knowledge of the Dungeness River Watershed.

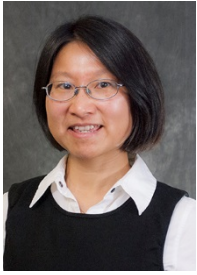
SELECTED EXPERIENCE

Mr. Shreffler's research has improved our understanding of fisheries resources in riverine, estuarine, and marine environments in the Pacific Northwest. Through his rigorous environmental research, Mr. Shreffler has also influenced strategic client decisions. Selected projects are highlighted below.

- Puget Sound Ecosystem Recovery. Mr. Shreffler is currently serving on the Habitat Strategic Initiative Transition Team that is guiding 9 Local Integrating Organizations (LIOs) in the process of developing Near Term Actions (NTAs) for the 2016-2017 Puget Sound Action Agenda.
- Pysht River Estuary Restoration Project. Mr. Shreffler facilitated a technical group that developed restoration options for the Pysht River Estuary, co-lead the permitting, and contributed to 100% design for the project. When funding is secured to implement on-the-ground restoration, **this will be one of the largest ecosystem restoration projects on the Olympic Peninsula.**
- Waterfront Transportation Improvement Project. Mr. Shreffler worked with a team of consultants under contract to the City of Port Angeles on a multi-year, multi-phase revitalization of the City waterfront, including restoration of shoreline and pocket beach habitat. **He was the lead author on the biological assessment for the project and co-lead for permitting.**
- Jimmycomelately Creek (JCL) Ecosystem Restoration Project. Mr. Shreffler developed a comprehensive plan for realigning JCL into one of its historical, sinuous channels, and integrating this channel realignment with improvements in, and restoration of, estuary functions. He maintained the project database, coordinated implementation of monitoring efforts, and has authored, co-authored, or edited 8 technical reports on all aspects of this multiple-year, \$7 million restoration project. **This was a holistic, large-scale, long-term ecological restoration project at the landscape scale, involving 29 partners. The project has won local, state, and national awards of environmental excellence.**
- Ennis Creek Restoration Project. Mr. Shreffler facilitated a diverse technical team and produced a conceptual plan for restoring Ennis Creek and Estuary through the former Rayonier Mill Site, now a Superfund Site. Under Mr. Shreffler's guidance, **the work was accomplished in a highly charged political environment in a short period of time and has broadened the conversation about future uses of the Rayonier Site to include ecological restoration.**
- Salmon Creek Estuary Restoration Project. Mr. Shreffler developed and implemented a vegetation monitoring plan for this large scale estuarine restoration project in Discovery Bay, WA. Mr. Shreffler also assisted with training volunteers, developing a master plant species list, and field data collection.

Baseline, implementation, and performance monitoring as outlined by Mr. Shreffler will enable the North Olympic Salmon to rigorously evaluate the successes and failures of this project relative to performance criteria.

- Seashore Lane Berm Enhancement Project. Mr. Shreffler, working in conjunction with Four Season's Engineering, planned, designed, permitted, constructed, and monitored this project. Over 1500 feet of shoreline that would otherwise have been riprapped or bulkheaded were protected using a three-phased approach of beach nourishment, log & rootwad placements, and revegetation. **The Puget Sound Action Team has used this as a demonstration site for alternative shoreline stabilization techniques. The project is also a case history in WDFW's Marine Shoreline Design Guidelines.**
- Siebert Creek Watershed Assessment. Mr. Shreffler was the technical lead on a team effort to perform a watershed assessment for Siebert Creek. **Based on the assessment, the team developed a list of prioritized protection, restoration, and education opportunities.**
- King County Core Areas Project. Mr. Shreffler participated in a team effort to develop a framework for prioritizing salmon habitat conservation and restoration for King County. The project involved fieldwork, GIS-mapping, literature review, and data analysis and interpretation. **The habitat prioritization framework helped to guide KC's habitat protection and salmon recovery efforts.**
- Restoration of Urban Estuaries: New Approaches for Site Location and Design. This study led by Mr. Shreffler was among the first to apply landscape ecology principles to siting and design of restoration projects in northwest estuaries. **The final report has been used by Washington State Department of Natural Resources to help determine aquatic lands that should be reserved for restoration vs. lands that could be commercially leased by the State.**
- National Habitat Restoration Project Review. Mr. Shreffler was the lead author on a project for the Institute for Water Resources, U.S. Army Corps of Engineers, which compiled full documentation and costs for 50 non-Corps restoration projects nationwide. **IWR used our final report to develop environmental restoration guidance documents for Corps District planners and engineers throughout the U.S.**
- The Gog-Li-Hi-Te Wetland System in the Puyallup River Estuary, Washington. Mr. Shreffler conducted groundbreaking research to assess the functional performance of this 10-acre wetland constructed as mitigation by the Port of Tacoma. **This system, the largest estuarine wetland restoration project in the state at that time (1987), has become a national wetlands demonstration site for the Waterways Experiment Station, U.S. Army Corps of Engineers. Our restoration efforts and subsequent research at the wetland resulted in an award for the Port of Tacoma in 1988 as the most environmentally aware port in the nation.**
- Commencement Bay Restoration Plan and Programmatic Environmental Impact Statement. Mr. Shreffler was the lead author on a series of five technical reports that provided guidance on how to use landscape ecology principles to restore injured natural resources in Commencement Bay. **The Commencement Bay Natural Resource Trustees used these reports to develop a bay-wide plan for siting restoration projects in optimal locations to ensure that they are linked to existing viable natural habitats, as well as functionally and structurally integrated into the watershed.**
- Pacific Northwest Coastal Ecosystem Regional Study (PNCERS). Mr. Shreffler was part of a field team for this joint program with the University of Washington and the University of Oregon, which is examining basic ecological, oceanographic, and social-economic aspects of coastal estuarine ecosystems in the Pacific Northwest. **This five-year research program provided managers with valuable information on how coastal ecosystems function and what factors have caused stresses to these systems.**



YAMMIE HO, PE

Transportation Engineer

17 YEARS OF
EXPERIENCE

EMPLOYER:
PARAMETRIX

BS, CIVIL
ENGINEERING,
UNIVERSITY OF
BRITISH COLUMBIA,
1998

PROFESSIONAL
ENGINEER, CIVIL, WA,
#40829, 2016

Yammie has been the lead design engineer for over 20 miles of trail projects, as well as projects involving route finding, pedestrian bridge structures, boardwalk systems, low-impact stormwater measures, stakeholder coordination, and wetland and stream mitigation. She has delivered eight trail construction packages in the past eight years. She has also provided technical input and cost estimating services to the conceptual planning and design of suburban/rural trails like the Westside Trail (Portland, OR area) and the Green to Cedar River Trail (southeast King County). She is proficient in software programs, such as, AutoCAD, AutoTurn, Land Development Desktop, MicroStation, Synchro, HCS, Sidra, and PowerPoint.

Selected Project Experience

Olympic Discovery Trail, Phase 2 – Sequim, WA

Client: City of Sequim

Dates: 2008

Yammie was the lead project engineer for managing the design and construction of this 0.5-mile separated, multi-purpose asphalt trail through a scenic trail easement area. This federally funded project connects the Johnson Creek Railroad Bridge at White Feather Way and extends south in a forested area through a private property. Yammie was responsible for tasks from analyzing alignment alternatives to preparing final bid documents. She also managed the construction administration on behalf of the City, serving as an extension of City staff to coordinate with WSDOT Local Programs and the private owner who donated the trail easement. One major project challenge was to efficiently incorporate alignment and design changes during construction to comply with the private owner's requests while finding a compromise to minimize the construction costs for the City. Her dedication enabled the City to gain acceptance of the trail alignment through the private trail easement in 2 weeks. Other design features included modular block retaining wall, embankment construction, signing, trail crossing channelization, culvert, trail amenity, right of certification, archaeological/cultural resources survey report, and wetland delineation. Yammie's success in working with multiple stakeholders on the front end for this federally funded project is advantageous to other trail projects.

East Lake Sammamish Trail – King County, WA

Client: King County

Dates: 1999-Present

As Lead Civil Engineer for the Master Plan Trail from the City of Issaquah to the City of Redmond, Yammie led the engineering team from concept development through construction for the Master Plan Trail. Master Plan Trail design elements include a paved trail with shoulders, parking lot facilities, stormwater practices, structural earth walls, soldier pile walls, sidewalk connections to East Lake Sammamish Parkway, critical area mitigation, culvert extensions, illumination, utility adjustment coordination, signings, fencing, and other trail amenities. She helped lead a value engineering workshop after the 30-percent design of the entire corridor. As the final design of each segment has advanced, she has applied those value engineering ideas where appropriate to reduce project cost and risk. Being the lead engineer for a controversial project, Yammie has managed and oversaw the design tasks with detailed documentation of the design criteria, technical decisions, cost estimates, and communication records with different permitting agencies to ensure the client's preparedness to be scrutinized by the public and adjacent property owners. Continuous collaboration with environmental and engineering specialists (like wetland biologists and structural engineers) enables



Yammie to avoid or address environmental concerns and formulate solutions throughout the design process. She also constantly looks for opportunities to incorporate aesthetic and sustainability elements into the project at a reasonable, affordable cost.

Lake to Sound Trail Design – SeaTac, WA

Client: King County

Dates: 2010-Present

Yammie is the lead design engineer for this federally funded nonmotorized transportation system across multiple jurisdictions. The trail corridor includes a nonmotorized undercrossing of SR 509, a railroad undercrossing, a boardwalk system across a wetland, a paved trail separated from or adjacent to a road, and a HAWK signal for a pedestrian crossing. During the conceptual phase, a crossing alternative feasibility study was conducted for a grade-separated undercrossing of the existing Monster Road bridge across the Black River. The feasibility study also considered and studied factors such as structural constraints of the existing road bridge, vertical clearance area for the undercrossing, environmental constraints such as ordinary high water and flood elevation of Black River, and other regulatory issues associated with flood storage and construction costs. This project also requires close coordination with WSDOT Local Programs, BNSF, and Union Pacific on acquiring air-space lease and easements. Yammie's experience from other previous projects makes her efficient in pinpointing issues and prioritizing the processes with WSDOT and the railroad companies.

Lakeview Trail – Mountlake Terrace, WA

Client: City of Mountlake Terrace

Dates: 2012-2014

Yammie is the lead engineer for this 1-mile regional trail adjacent to Lakeview Drive, connecting the Interurban trail to the transit center on the east side of I-5 and the Mountlake Terrace Town Center. This non-motorized facility is adjacent a residential condominium neighborhood, a park with ballfield, and Ballinger Lake Golf Course. This project includes alternative analysis on various non-motorized facilities including: sidepath, bike lanes with sidewalks, and cycle tracks; cost estimating; traffic and parking space analysis; preliminary and final design of the selected alternative; intersection and Hawk signal design for a major crossing; rapid flashing beacons for midblock crossings; retaining walls; bus stop landings; rechannelization of existing roadways; utility relocation; landscaped medians; air-space lease for trail within I-5 limited access; and right-of-way acquisition of one private property.

Marymoor Park Connector Trail – Redmond, WA

Client: King County

Dates: 2007-2011

Yammie managed the design of this 1.5-mile trail through Marymoor Park, connecting the Sammamish River Trail to East Lake Sammamish Trail. Design features included a 420-foot prefabricated concrete panel boardwalk, retaining walls, drainage facilities, fencing, gates, signage, landscape planting, and mitigation planting. Her tasks for PS&E included preparing construction plans, specifications, and cost estimates; conducting agency coordination; and performing utility adjustment coordination. She worked with the landscape architect as a team, transforming the schematic alignment, sections, and detail sketches into construction plans and adjusting the elements to be constructible. One challenge for the project was to balance cut-and-fill volumes to avoid floodplain mitigation and additional permitting costs for the trail extension through the storage property. During the bidding process, she helped the client review bid proposals and evaluate qualifications of bidders against award criteria so that they could choose the most qualified bidder. During construction, Yammie was responsible for responding to RFIs and reviewing shop drawings. Throughout the process, she efficiently adjusted the design to reduce the construction costs to cope with available funding. Her teaming experience with the landscape architect and stormwater engineer are valuable assets for trail construction projects.



Paul D. Agrimis, RLA, PE, PWS

Landscape Architect

EDUCATION

MLA, Landscape Architecture, 1989, University of Washington

BSE, Civil Engineering, 1979, University of Connecticut

30 YEARS EXPERIENCE

CERTIFICATIONS/ REGISTRATION

Registered Landscape Architect in Oregon (No. 319), Washington (No. 640), and Alaska (No. 13234)

Professional Civil Engineer in Oregon (No. 14,851), Washington (No. 33,054), and Alaska (No. 7,093)

Professional Wetland Scientist, Society of Wetland Scientists (No. 1,081)

PROFESSIONAL AFFILIATIONS

American Society of Landscape Architects (ASLA)

American Society of Civil Engineers (ASCE)

Board Member, River Restoration Northwest (RRNW)

Society of Wetland Scientists (SWS)

The Association of State Wetland Managers (ASWM)

AWARDS

As a landscape architect, civil engineer, and professional wetland scientist, Paul's 30 years of project experience spans park and trail system planning, natural resources management planning, and park, trail and habitat enhancement design. Many of Paul's projects have involved large geographic areas spanning numerous jurisdictions; he applies critical thinking and creative problem solving skills to identify key decision points, and he works closely with clients and stakeholders to gain consensus and move projects to successful conclusion.

Paul draws on his versatile experience to add value and efficiency to complex projects. He has worked with a wide variety of parks agencies throughout the Pacific Northwest and he has led many of ESA's most successful projects including Chehalem Heritage Trails Strategic Plan, Clark County Wetlands Inventory and Strategy, and Cooper Mountain Nature Park.

Relevant Experience

Sullivan Creek Dispersed Recreation Site Closure & Restoration Planning, Pend Oreille County, WA. *Project Director.* Numerous dispersed recreation sites are located along Sullivan Creek and Sullivan Lake Roads in close proximity to the creek that does not support fish habitat objectives. Closure and/or restoration by Seattle City Light of up to 38 dispersed recreation sites located in riparian areas along Sullivan Creek have been identified to help restore fish habitat. Paul has provided senior review of the conceptual restoration.

Cape Disappointment State Park Baker Bay Trail and Boardwalk, Pacific County, WA. *Project Director.* Paul was the Project Director for this approximately 1,400-foot long multi-use trail project in Cape Disappointment State Park. The park is located where the Columbia River meets the Pacific Ocean and has historical importance with the Lewis and Clark Expedition. ESA developed two alternative trail alignments and cost estimates at a schematic level in Phase 1: Preliminary Design. In Phase 2: Design Development ESA refined the selected alternative into two separate construction packages for phase construction. Phase 2a was completed in January 2010. It includes road realignment, parking lot reconfiguration and resurfacing, drainage design, including swales and pipes, rockery retaining wall, trail and interpretive nodes and overlooks. Phase 2b will be constructed as funding becomes available. It includes an elevated walkway, trail, boardwalk, and interpretive nodes and overlooks. ESA also provided permitting support.

Birch Bay Drive and Pedestrian Facility, Whatcom County, WA. *Project Manager.* Paul is leading this 1.5-mile beach renourishment project on Birch Bay. This project will reduce flooding and storm damage, improve pedestrian safety, enhance shore access, and improve storm drainage along Birch Bay Drive between Lora Lane and

Cedar Avenue. The project includes a pedestrian path following a very substantial gravel berm, extensions of 15 stormwater outfalls, fish passage improvements for a culverted stream, and native plant revegetation. This project is beginning the National Environmental Policy Act (NEPA) process and is scheduled for construction beginning in 2016.

Jorgenson Park Master Plan and Phase 1 Development, Clark County, WA.

Project Director. Paul was the Project Director for the development of this 6.5-acre neighborhood park with significant natural resources including wetlands and Chicken Creek. ESA collected base data describing the condition of the existing site vegetation and made recommendations on how best to incorporate native vegetation enhancement into the master plan for the park. ESA provided meeting materials and supported Vancouver-Clark Parks and Recreation (VCPRD) staff at two community meetings. ESA took the master plan through design development and construction documents and cost estimates. The design includes a playground, soft surface trail network, a boardwalk over Chicken Creek and associated wetlands, and site furnishings. In addition, the project includes approximately 4 acres of restoration planting. ESA also prepared preliminary and final wetland permit applications, a JARPA for Hydraulic Project Approval, a Storm Water Pollution Prevention Plan for NPDES permit compliance and Stormwater Plan Technical Information Reports.

Greyhawk Park, Clark County, WA. *Project Director.* Paul was the Project Director for the design development, construction document production, and permitting for a five-acre neighborhood park within the Pleasant Valley area. In addition, ESA prepared site development including an enhanced wetland and reforestation of approximately one quarter of the park site to restore native plant communities and to improve local wildlife habitat.

NE 134th Street Wetlands Services, Clark County, WA. *Wetlands Task Leader.*

Paul was the wetlands task leader for this project. He delineated and provided a functional assessment of the wetlands along the project corridor and identified potential mitigation sites. He led the wetland mitigation design for on-site mitigation, creating emergent, and scrub-shrub wetlands adjacent to existing forested slope wetlands. Paul also prepared applications and secured permits for this project.

Sandy Boulevard Green Street, Portland OR. *Quality Assurance/Quality Control (QA/QC).* Paul provided QA/QC for this project which involved providing the City with engineering and landscape architecture services for green street and safety improvements along a portion of SE Sandy Boulevard near SE 9th Street. The project corridor poses challenging motor vehicle, pedestrian, and bicycle access as well as non-standard sidewalk and roadway geometries. ESA designers developed a comprehensive streetscape design that addresses unsafe and undesirable roadway conditions while enhancing the streetscape.

Scouter Mountain Nature Park, Happy Valley, OR. *Project Director.* Paul is the Project Director for this development of visitor facilities for a 68-acre nature park including shelter with restrooms, parking, utilities, and planting design. Paul assisted with siting of the shelter and in generating concepts for site layout. He is providing design oversight and Quality Control/Quality Assurance for project deliverables to Metro, Happy Valley, and DEQ.



PHOEBE JOHANNESSEN, PE

Stormwater Engineer

20 YEARS OF
EXPERIENCE

EMPLOYER:
PARAMETRIX

BS, CIVIL/
ENVIRONMENTAL
ENGINEERING,
SEATTLE UNIVERSITY,
1994

STREAM
RESTORATION
CERTIFICATE,
UNIVERSITY OF
WASHINGTON

PROFESSIONAL
ENGINEER, CIVIL, WA,
#37382, 2001

Phoebe is a senior engineer with experience in stormwater planning, engineering, and permitting. She specializes in preparation of stormwater reports and PS&E documents in support of motorized and non-motorized transportation projects. Phoebe is experienced in hydraulic and hydrologic analysis, design of water quality treatment and flow control BMPs, conveyance design, temporary erosion control design, low impact design BMPs, fish passage culvert design, stream channel relocation, and habitat enhancement. Her project work has included preparation of stormwater documentation for EISs, EAs, and BAs, as well as PS&E for environmentally sensitive multi-use trail and roadway projects throughout King and Snohomish counties.

Phoebe has worked on several trail projects including North Creek Trail, East Lake Sammamish Trail, Marymoor Park Connector Trail, and Lake to Sound Trail. Additionally, she has worked on several motorized roadway projects that contained trail sections as well. These projects included the SR 520 West Lake Sammamish Parkway to SR 202 Flyover Ramp, in which Phoebe designed 1,800 feet of pervious asphalt trail adjacent to the flyover ramp, and the Valley Access Project in Clallam County, which contained 3,000 feet of new trail adjacent to a roadway-widening project.

Selected Project Experience

Olympic Discovery Trail Extension Stormwater Design Review – Sequim, WA

Client: Jamestown S'Klallam Tribe

Dates: 2008

This project for the Jamestown S'Klallam Tribe was an extension of the Olympic Discovery Trail. Phoebe reviewed the existing stormwater design for cost-saving measures and compliance with regulatory requirements, revised the conveyance design, and designed new water quality treatment and flow control facilities which included StormFilter® catch basin units and an infiltration gallery. The project regraded and paved an existing gravel parking lot, added a new parking area, and constructed a 12-foot-wide multi-use trail adjacent to the Tribe's government buildings. Phoebe implemented cost-saving measures to the existing design including changes in grading, reduction of walls, revised drainage system, and revised trail profile resulting in construction cost savings of approximately \$100,000.

Chicken Coop-Zaccardo Road Realignment – Blyn, WA

Client: Jamestown S'Klallam Tribe

Dates: 2011-2014

This project reconfigured two roads intersecting with US 101 into a single, safer intersection. Phoebe provided stormwater management design and documentation for the project to comply with WSDOT, Tribal, and County requirements. She prepared TESC and stormwater plans, specifications, and estimates for the bid package. This project included removal of a fish passage obstruction and design of a new fish passage culvert under the realigned roadway.



East Interchange on US Highway 101 – Sequim, WA

Client: Jamestown S'Klallam Tribe

Dates: 2006-2010

Phoebe was the stormwater lead on the first phase of this project which included the environmental documentation of two interchange safety improvements and lane widening on US 101. She was responsible for preparing the conceptual stormwater design, Surface Water Discipline Report, and stormwater pollutant loading calculations in support of the environmental assessment and the biological assessment. In the second phase of the project, Phoebe led the PS&E of the stormwater elements from preliminary through final design including preparation of the draft and final hydraulic reports for WSDOT.

Sammamish River Habitat Restoration project No. 3 (HEP3) – Redmond, WA

Client: City of Redmond

Dates: 2002-2007

Phoebe provided stormwater design for the HEP3 project which improved fish and wildlife habitat along approximately 600 feet of the Sammamish River from Redmond Way at the upstream boundary down to the BNSF railroad trestle. The purpose of this phase of the project was to develop construction plans and specifications, an opinion of probable cost, and finalize permits submitted under Phase 1 necessary for construction of the project. Phoebe's redesigned the existing failing water quality facilities which included two bioswales; one that had become too shaded and one that had become channelized. The shaded swale was re-shaped and replanted, and incorporated level spreaders to maintain even flow. The channelized bioswale was redesigned as a constructed wetland with a sediment forebay, level spreaders, and an outlet weir. The outlet pipe was replaced with a pipe-arch culvert and a boulder cascade down to the river.

Elwha Valley Road – Port Angeles, WA

Client: Lower Elwha Klallam Tribe

Dates: 2009-2011

The purpose of this project was to provide a new primary access road that would function as a reliable tsunami escape route for the Lower Elwha Tribal reservation. Phoebe's role was to design the stormwater management -including conveyance, water quality, and flow control facilities to treat roadway runoff and convey off-site water through the project. Challenges for this project included construction through residential neighborhood with encroachments into the right of way, existing utilities, crossing of gully, flat grades and steep slopes, high groundwater, and sensitive areas. Stormwater facilities included infiltration ponds, media filter drain, and CAVFS.

Main Access Road Culvert - Clallam Bay, WA

Client: Washington State Dept. of Corrections

Dates: 2010-2012

Phoebe was the project manager and the primary engineer for the assessment of 16 existing culverts under the main access road to the Clallam Bay corrections facility. The project involved a hydrologic and hydraulic assessment of a failing culvert causing a sinkhole in the road above; evaluation of various rehabilitation and replacement alternatives with the criteria that the access road has to remain open during construction; CCTV inspection, evaluation of inspection video, rehabilitation/replacement methods, and prioritization schedule and cost for the remaining 15 culverts. Work also included determination of fish bearing streams and cost estimates and construction methods for fish passage culvert replacements.

David Miller, P.E., Ph.D.
Principal Consultant



Dr. David Miller has applied his extensive water resource engineering experience throughout the United States and overseas. For the past sixteen years he has focused on California water resource issues working with agricultural and urban water districts on planning, design and construction management assignments. In addition to his engineering activities, he has prepared successful grant applications on behalf of GEI clients for funding from a range of state and federal sources. Dr. Miller has served on the Board of Directors of the California Irrigation Institute for the past four years and recently completed his tenure as president of that organization.

RELEVANT PROJECT EXPERIENCE

Agricultural Drainage Control Project, Stevenson Water District, Newman, CA. Dr. Miller served as project manager for a State Water Resources Control Board-funded project to enhance a wetland system for storage, treatment and controlled release of agricultural drainage and storm water to the San Joaquin River. Activity performed during implementation of this work included design, permitting, equipment procurement, construction management, and project monitoring. The primary purpose of the project is to retain agricultural drainage in a chain of managed wetlands to encourage uptake of nutrients and detention of drainage flows enabling release to the San Joaquin River during periods when the assimilative capacity of the river is high. The project is intended to assist in compliance with the San Joaquin River Upstream of Vernalis Salt and Boron Basin Plan Amendment.

San Carlos Irrigation Rehabilitation, San Carlos Irrigation and Drainage District, Coolidge, AZ. The technical objectives of this project are to rehabilitate approximately 40 miles of main canal and improve the District's lateral canal system to remove and manage sediment, conserve water, minimize operation and maintenance costs, and improve operational effectiveness of this irrigation system which diverts water from the Gila River. As Project Manager for Phase 1, Dr. Miller led coordination with agencies including Reclamation, the U.S. Army Corps of Engineers and Pinal County flood management staff necessary for completion of the Environmental Assessment and for issuance of federal, state and county permits required for construction. Dr. Miller was heavily engaged in preparation of designs for rehabilitation and modernization of the headworks of the Florence Casa Grande Canal and for construction of a new settling basin to retain sediment diverted from the Gila River and was later involved in construction management of these facilities which were completed in early 2012. He also coordinated the effort to procure a dredge to be used for removal of sediment deposited in the Settling Basin. This dredge was commissioned in early 2013.

Semitropic Water Storage District, Wasco, CA. Dr. Miller initiated preparation of an Agricultural Water Management Plan that portrayed water management and water conservation initiatives undertaken by Semitropic. This plan described the intricate water banking and conjunctive water management programs operated by the district as well as detailing the district's facilities and irrigation operations. The plan helped Semitropic comply with the requirements of California's Agricultural Water Suppliers Efficient Water Management Practices Act.

Modesto Basin Integrated Regional Groundwater Management Plan, Stanislaus and Tuolumne Rivers Groundwater Basin Association, Modesto, CA. This project included the development of a groundwater management plan, an implementation plan, and a groundwater monitoring plan for the Association, the governing body composed of six member agencies with Modesto Irrigation District as the lead agency. Dr. Miller's efforts focused on development of a groundwater management plan for a group of agencies overlying the Modesto

EDUCATION

Ph.D., Biology/Agriculture Eng, North Carolina State University
M.S., Irrigation Engineering, Utah State University
B.A., English Literature, University of North Carolina

EXPERIENCE IN THE INDUSTRY

42 years

EXPERIENCE WITH GEI

11 years

REGISTRATIONS AND LICENSES

Professional Engineer, IL No. 00620-045998

Groundwater Basin including the Modesto Irrigation District, the City of Modesto, the Oakdale Irrigation District, the City of Oakdale, the City of Riverbank and Stanislaus County. The plan conforms with the requirements of the California Groundwater Management Planning Act (SB1938) and the Integrated Regional Water Management Planning Act (SB1672).

Stevinson Water District, Newman, CA. Dr. Miller prepared NEPA and CEQA documents required to support the district's program of water transfers to wildlife refuges managed by the Bureau of Reclamation. In addition, he prepared NEPA and CEQA documents and Storm Water Pollution Prevention Plans (SWPPPs) required for various construction projects carried out by the district.

Turlock Irrigation District Water Management Plan, Turlock, CA. Dr. Miller served as Project Manager for development of the Turlock Irrigation District Agricultural Water Management Plan, a plan submitted by the district in accordance with its signatory status under the California Agricultural Water Suppliers Efficient Water Management Practices Act. The plan was the second plan to be endorsed by the Agricultural Water Management Council. Dr. Miller was actively involved in development of a water budget and in formulation of alternatives and benefit/cost analyses presented in the plan.

Oakdale Irrigation District – Water Measurement Study, CA. As Project Manager, Dr. Miller assisted the Oakdale Irrigation District perform a study of options for developing a comprehensive program for measuring spillage, drainage and stormwater outflows from its service area. The measurement program served as the foundation for strategic planning on how best to manage and utilize these outflows.

Merced Irrigation District Water Management Plan, CA. Dr. Miller served as Project Manager for preparation of an Agricultural Water Management Plan to enable MID to comply with the requirements of California's Agricultural Water Suppliers Efficient Water Management Practices Act. Preparation of this plan involved development of an extensive water balance of the district's operations, generation of benefit/cost analyses of various water management options and production of the narrative of the plan, which describes the operation of the District and the opportunities for water conservation and conjunctive water management that were revealed through the water balance and benefit/cost analyses.

City of Woodland Water Supply Project, Woodland, CA. The City of Woodland investigated expanding their water supply by considering alternatives that include increased groundwater pumping and diversion of water from the Sacramento River. Among the alternatives considered were provisions for in-lieu recharge by agricultural users. This in-lieu recharge program would involve extending surface water conveyance systems so that Woodland could deliver surface water to irrigators currently reliant on groundwater. The reduction in groundwater pumping resulting from in-lieu recharge would mitigate the impacts of increased groundwater usage by the City. This study included review of county crop reports, DWR land use data, and aerial mapping used to support interviews with growers to determine their irrigation practices and the timing and quality of their water use.

Sonoma County Water Agency – Russian River GIS, Santa Rosa, CA. The Sonoma County Water Agency developed a GIS of the Russian River Basin to assist in carrying out its modeling and management responsibilities. Dr. Miller served as Project Manager for development of techniques used to estimate water consumption within the Russian River Basin. The project focused on estimation of actual water use by wine grapes. Because wine grapes are typically deficit-irrigated to improve quality and because cultural practices such as trellis configurations affect crop water demand, state-of-the-art techniques were applied to estimate water consumption from vineyards and riparian areas.

Evaluation of Irrigation Management Practices, Metropolitan Water District, Los Angeles, CA. MWD contracted with GEI to assist the district manage its water transfer program with the Palo Verde Irrigation District. Dr. Miller managed development of a GIS/geodatabase that enabled program managers to track key indicators of program status, map enrolled areas and clearly and accurately present information on program activity to participating landowners and other stakeholders.

Matthew J. Powers, P.E.
Senior Geological Engineer



Mr. Powers is a Senior Engineer responsible for project management, leading field exploration programs, and performing geotechnical, geologic, and geomorphic analyses. His range of services includes geotechnical and geological site investigation, site reconnaissance and characterization, geomorphic assessments, and engineering analyses related to seepage, stability, and settlement of dams, levees, and other structures. Mr. Powers has worked on projects involving surficial geologic mapping, sub-surface exploration, evaluation, and design of levees, dam safety monitoring, slope stability and long term slope monitoring, design and installation of well monitoring systems, deep excavation, and installation and monitoring of shoring wall and buttress systems including tie backs, soil nails and sheet piling.

PROJECT EXPERIENCE

Black Butte Erosion Repair Project, City of Santa Clara, Orland, CA (Aug 2015 – Present). Project Manager overseeing the design and environmental permitting for repair of bank erosion areas downstream of the dam outlet, adjacent to the City's powerhouse facility. The project involves geotechnical and hydraulic evaluation, development of alternative concepts for erosion repair, selection of a preferred alternative for stabilization for final design, and acquiring the necessary permitting and regulatory agency/stakeholder approvals to construct the repair.

Coyote Creek Levee Evaluation, Marin County Flood Control District, Marin County, CA (May 2014 to Present). Geotechnical exploration program manager overseeing and coordinating geotechnical explorations performed for the project. Activities included review of available background information and data, site reconnaissance, planning and executing the exploration program, and coordinating access and permitting requirements with the client and stakeholder agencies. The project involves performing an evaluation of the Coyote Creek levee system located in the unincorporated community of Tamalpais Valley. The overall goal of the project is to provide a comprehensive assessment of the current condition of the levee system and develop recommendations for both short- and long-term improvements.

Category 1 Levee Evaluations, Alameda County Flood Control & Water Conservation District, Hayward-Union City, CA (2009 to Present). Project Engineer and geotechnical exploration manager for the assessment and evaluation of flood control systems within Zones 4, 5, and 12 of Alameda County. Work tasks include coordinating the hydrologic and hydraulic evaluations of the drainage reaches, and performing geotechnical evaluations for identified levee reaches where flood protection is provided in urban areas within the District's jurisdiction. Evaluations included performing initial and task specific site reconnaissance, planning and executing geotechnical and geologic explorations, site and regional geologic, geomorphic, and seismic assessments, developing subsurface profiles and overall site characterization, performing seepage, slope stability, and seismic analyses, and preparing Geotechnical Evaluation Reports for District use in FEMA accreditations. Completed final plans, specifications, and engineer's estimates for construction of levee improvements required to obtain FEMA accreditation.

Shoreline Levee Design, Alameda County Public Works Agency, Hayward, CA (2009 to Present). Project Engineer and geotechnical exploration program manager for evaluations of existing coastal, salt pond, and riverine levees within the planned extents of Eden landing portion of the SBSRP. Evaluations include evaluation of the overall performance of the existing levees with respect to 100-year tidal levels, possible storm breach scenarios, and expected long-term sea level rise. Tasks included on-site reconnaissance of levee conditions and implementation of a geotechnical exploration program in support of seepage, slope stability, and seismic

EDUCATION

B.S., Civil Engineering, California Polytechnic State University, San Luis Obispo
M.Sc., Geological Sciences, University of British Columbia

EXPERIENCE IN THE INDUSTRY

11 years

PREVIOUS 10 YEARS EXPERIENCE

GEI: 7 years
Treadwell & Rollo: 4 years

REGISTRATIONS AND LICENSES

Professional Engineer, CA No. 76504

PROFESSIONAL ASSOCIATIONS AND CERTIFICATIONS

American Society of Civil Engineers
Association of Environmental and Engineering Geologists
USACE Certified Levee Inspector
CA DWR Approved Geotechnical Boring

analyses. Results of studies used by the District in understanding the current level of flood protection provided by the existing salt pond levees, identify critical levee reaches susceptible to damage or failure, and inform planned restoration efforts of the South Bay Salt Pond Restoration Project.

Lower Llagas Creek Capacity Restoration Project, Santa Clara Valley Water District, Gilroy, CA (Sept 2011 to July 2012). Project Engineer and geotechnical exploration program manager for a levee reach along Llagas creek providing flood protection in urban, industrial, and agricultural areas. Evaluations included performing initial and task specific site reconnaissance, planning and executing geotechnical and geologic explorations, site and regional geologic, geomorphic, and seismic assessments, developing subsurface profiles and characterization, performing seepage, slope stability, and seismic analyses, and preparing Geotechnical Evaluation Report for District use in evaluating alternatives for levee improvements to restore hydraulic capacity within Llagas Creek.

San Francisquito Creek Flood Protection Project, SFC JPA, Palo Alto, CA (Dec 2009 to Dec 2014). Project Engineer and geotechnical exploration program manager for the explorations and analyses performed for the design of 8000 feet of new levees and floodwalls along the lower reach of San Francisquito Creek. The site is underlain by shallow fill over soft compressible silty clay known locally as Bay Mud. Services included site reconnaissance and review of existing levee data and geomorphologic information, performing limited access drilling and sampling programs, cone penetration testing (CPT), and processing and compilation of boring, laboratory test and CPT information (gINT). Results of the exploration program were used to characterize subsurface conditions and inform engineering analyses. Geotechnical analyses included seepage, stability, settlement, and seismic performance evaluations for the design of setback levee and floodwall alignments, development of design criteria for new levees, including staged construction to account for the low strength and high compressibility of the Bay Mud. Design Criteria was also developed for sheet pile and retaining wall-type floodwalls.

Feather River Levee Repair Project, Three Rivers Levee Improvement Authority, Marysville, CA (Aug 2008 to Oct 2013). Contributed to the design and construction of repairs to 14 miles of the east bank Feather River levee in southern Yuba County. Levee repair measures include levee strengthening along 8 miles of existing levee and design and construction of a 6-mile long setback levee to replace a section of levee that failed during the January 1997 flood. Coordinated and directed numerous field exploration programs to evaluate subsurface geologic conditions. Exploration programs include geotechnical and geologic borings, instrument installation and long-term monitoring (piezometers, inclinometers) and field vane shear testing of levee foundation material. Results of explorations used in geotechnical analyses including slope stability, foundation settlement, and groundwater seepage. Design, installation, and analysis of relief well systems to alleviate groundwater pressures below the levee foundation during flood events.

Calero and Guadalupe Dams Seismic Retrofits Project, Santa Clara Valley Water District, San Jose, CA. (Sept 2013 to Present) Geotechnical exploration program manager overseeing and coordinating geotechnical exploration tasks performed for both Calero Dam and Guadalupe Dam. The project includes formulating alternatives to remediate seismic deficiencies at Calero and Guadalupe dams that were identified in prior Seismic Stability Evaluations. Lead and coordinated geotechnical and geologic explorations, and borrow evaluations to further define the dam safety issues and develop feasible alternatives to remediate the seismic and other identified deficiencies. Conceptual alternatives for remediation include downstream earthfill buttresses or in situ treatment of the embankment and foundation along with improvements to the outlet works and spillway. The studies provide detailed evaluations for selection of a preferred alternative for final design.

Natomas Levee Improvement Program Peer Review Services, Sacramento Area Flood Control Agency, Sacramento, CA (Dec 2011 to Aug 2012). Lead role in geotechnical field exploration program using direct-push geo-probe equipment and sonic drilling methods to collect continuous soil core samples of previously placed levee fill and cut-off wall cap material. Peer review involved assessment of in-place levee fill and cut-off wall cap material composition with respect to contract specifications.

Graham Bradner, P.G., C.E.G., C.H.G., P.M.P.
Senior Geologist



Graham Bradner is a Professional Geologist, Certified Engineering Geologist, and Certified Hydrogeologist. His background includes expertise in subsurface exploration, subsurface and aquifer characterization, relief well and extraction well design, and geotechnical modeling. Mr. Bradner has extensive knowledge of geotechnical drilling techniques, and is also experienced with aquifer testing and analysis procedures, geophysical data interpretation, and geomorphologic and geologic interpretation of subsurface conditions, which he routinely applies to dam and levee projects.

Mr. Bradner regularly interfaces with State and Federal regulatory agency representatives, and provides detailed technical presentations to clients and reviewers. He routinely develops project scopes, costs, and schedules, and performs ongoing project management activities for several simultaneous projects.

PROJECT EXPERIENCE

Sacramento River East Levee Improvement Project, Sacramento Area Flood Control Agency, Sacramento, CA. Project Geologist supervising all aspects of the investigation and evaluation of 8.1 miles of levee along the eastern bank of the Sacramento River, which protects urbanized Sacramento and Pocket area neighborhoods. Work consisted of gathering geotechnical information and performing an evaluation of the levees for seepage and stability with the objective of identifying deficiencies and developing remedial measures, where necessary, and complying with USACE criteria on these Federal levees.

Levee Evaluations, Kings River Conservation District, Fresno, CA. Project Manager for the evaluation of 140 miles of flood project levees within the District's service area. Tasks include identifying deficiencies and recommending appropriate management actions, where appropriate. The scope includes the review of existing information, identification of data gaps, collection of additional data, performing analyses, and review of remedial alternatives.

DWR Urban and Non-Urban Levee Evaluations Program, California Department of Water Resources, Statewide, CA. GEI Project Manager for the following Study Areas:

- ULE Marysville, 7.6-mile ring levee, Marysville, CA
- ULE Sutter Feather River, 42 miles of levee, Feather River west bank, Thermalito Afterbay to Sutter Bypass
- ULE American River, 22 miles of levee, north and south bank from high ground to Sacramento River confluence
- NULE Colusa South, 23.5 miles of levee, Sacramento River west bank, Colusa to Tisdale Bypass
- NULE Colusa Drain, 13.5 miles of levee, Colusa Basin Drainage Canal east bank, South of Colusa

Responsibilities include interpretation of subsurface conditions and evaluations of levee performance. Developed subsurface investigation plans, managed field exploration programs, and performed analyses. Presented findings to clients, partners, and stakeholders. Coordinated numerous team partners to obtain access rights, local and

EDUCATION

M.S., Hydrogeology, Clemson University
B.S., Environmental Geology, Clemson University

EXPERIENCE IN THE INDUSTRY
13 years

EXPERIENCE WITH GEI
10 years

REGISTRATIONS AND LICENSES

Certified Engineering Geologist, CA No. 2495
Certified Hydrogeologist, CA No. 862
Professional Geologist, CA No. 7805

CERTIFICATIONS

Project Management Professional No. 1365358

regional permits, and cultural and biological clearances. Performed cost estimating, resource scheduling, and attended client meetings.

Coyote Creek Levee Evaluation, Marin County Flood Control District, Marin County, CA. Project Manager overseeing all aspects of the project including technical components as well as frequent coordination with the client and agencies. The project involves performing an evaluation of the Coyote Creek levee system located in the unincorporated community of Tamalpais Valley. The overall goal of the project is to provide a comprehensive assessment of the current condition of the levee system and develop recommendations for both short- and long-term improvements.

Feather River Levee Repairs and Setback Levee, Three Rivers Levee Improvement Authority, Marysville, CA. Provided drilling program oversight and coordination of subsurface investigations. Responsibilities included QA/QC review of drilling and soil logging procedures, relief well construction and performance testing, and coordination of field crews and drilling subcontractors.

DWR Non-Urban Levee Evaluations - Flood System Repair Project, California Department of Water Resources, Statewide, CA. GEI Project Manager for the DWR Flood System Repair Project. The project involves performing field reconnaissance of levees in rural areas to document current conditions, identify sites in need of repair, and develop remedial alternatives, where necessary. Responsibilities include review of surveillance findings, participation in project reviews, and development of remedial alternatives.

Klamath Glen Levee Evaluation, County of Del Norte Community Development Dept, Del Norte County, CA. Project Manager for the geotechnical evaluation of a 8,900-foot long levee on the Klamath River protecting the unincorporated town of Klamath Glen. Work consisted of reviewing existing information, developing a subsurface investigation and laboratory testing program, performing geotechnical analyses, and preparing documentation to support FEMA accreditation, as well as overall project management responsibilities.

Shoreline Levee Design, Alameda County Public Works Agency, Oakland, CA. Served as technical reviewer during geotechnical evaluations of levees providing flood protection in urban areas within the District's jurisdiction. Evaluations included performing site reconnaissance, planning and executing geotechnical explorations, site and regional geologic, geomorphic, and seismic assessments, developing subsurface profiles and overall site characterization.

Flood Emergency Response (Flood ER) Program, California Department of Water Resources, Sacramento, CA. GEI is the prime consultant assisting DWR with a major, multi-year program to overhaul California's Flood Emergency Response Program. The Levee Instrumentation Pilot Study was performed to evaluate the feasibility of a data collection network for the real-time collection of subsurface and embankment water level data at critical locations along the levee system. The project included collection and review of existing data to select the pilot study site, field investigations and soil classification, instrumentation network design, instrumentation installation and testing, preparation of an O&M Manual, and geotechnical analysis and reporting. Responsibilities include supervising all aspects of the project, including technical and management related tasks.

Guntersville Dam Stability Analysis, Tennessee Valley Authority, Guntersville, AL. Led the investigation effort for the earthen dike, which involved collection and review of available information, identification of data gaps, and development and execution of subsurface investigations. Guntersville Dam is located on the Tennessee River in Marshall County, Alabama. As a multi-purpose main river project, Guntersville Dam contributes to downstream flood reduction and the generation of hydroelectric power. The project also includes a two-mile long earthen dike protecting the Town of Guntersville.

Sly Park Dams Piezometer Design and Installation Project, El Dorado Irrigation District, Pollock Pines, CA. Project Manager for the development of conceptual and final piezometer designs and construction for Sly Park Main Dam and Auxiliary Dam. The scope included preparation of design plans, permitting, and construction contracting and oversight. The project was performed in coordination with State of California Division of Safety of Dams.



Michael Muscari, PWS

Senior Wetland/Plant Ecologist

EDUCATION

M.S., Plant Ecology,
University of
Minnesota

B.S., Environmental
Biology, University of
Colorado

Wetland Science and
Management
Certificate, University of
Washington

21 YEARS EXPERIENCE

PROFESSIONAL AFFILIATIONS

Certified Professional
Wetland Scientist
(PWS) by the Society
of Wetland Scientists

Michael is a Professional Wetland Scientist with 21 years experience in botany and terrestrial and aquatic natural resource studies. For the past 16 years he has concentrated on wetland related services and has worked on and managed a variety of projects throughout Washington, Oregon, and Alaska. Michael has developed conceptual and final restoration plans for uplands, riparian zones, and wetland mitigation, designed and implemented mitigation monitoring plans, written mitigation monitoring reports, delineated wetlands, confirmed delineated boundaries with regulatory agencies, conducted function assessments of wetlands, conducted wetland inventories, and obtained required permits from local, state, and federal government agencies. Michael has designed and implemented wetland mitigation and monitoring plans, and has provided technical assistance to the development of wetland mitigation banks. Michael also has prepared biological assessments (BAs) and has conducted threatened/endangered/sensitive (TES) plant species surveys in compliance with the Endangered Species Act. He has written plant species management plans, conducted invasive/noxious weed surveys, and surveyed and mapped vegetation.

Relevant Experience

Port of Seattle Wetland Redelineation, King County, WA. *Wetland Scientist.*

The Port of Seattle retained ESA to conduct a comprehensive redelineation of wetlands in the vicinity of SeaTac International Airport (STIA). ESA is managing this work, which is mandated by the 404 and 401 permits that were issued for STIA's master plan update project. This is a unique effort in that it requires the Port to quantify changes in wetland size and/or area that may have occurred indirectly as a result of the Third Runway construction. ESA has redelineated nearly 70 wetlands in the Miller Creek and Des Moines Creek basis and is comparing the results to the pre-project conditions that existed in the late 1990s and early 2000s, when the original permits were issued. This comprehensive field effort is providing valuable data on the extent and nature of wetland boundary changes over time. ESA is supporting the Port's discussions and negotiations with permitting agencies concerning the methods and results of the redelineation work.

BPA CR 223605 Wetland and Stream Mitigation, I-5 Corridor Reinforcement

Project. *Deputy Project Manager.* ESA is working with the Bonneville Power Administration (BPA) to provide wetland and stream mitigation strategy in support of the alternative alignments for the I-5 Corridor Reinforcement Project. BPA is currently evaluating environment impacts of several alternative alignments for the proposed 500-kilovolt transmission line from Castle Rock, Washington, to Troutdale, Oregon. ESA staff are developing a broad set of options and strategies for mitigating potential construction impacts related to new substations, towers, and access roads. Multiple options for wetland mitigation are being explored including avoidance and minimization of impacts, restoration, creation, preservation, use of fee-in-lieu programs, and use of established mitigation banks.

Mukilteo 2010 On-Call TO 3 Off-Site Wetland Mitigation Program. *Project Manager.* ESA assisted the City of Mukilteo (City) with a feasibility analysis for developing a wetland fee-in-lieu program, and the planning and development of an off-site wetland mitigation program; Mukilteo Critical Areas Mitigation Program. ESA worked with City staff to identify the potential need for future wetland mitigation for private and public development projects anticipated to be constructed over the next 5 to 10 years. Areas of the City and UGA expected to have the most development potential were identified and the relative degree of expected wetland impacts were estimated based on the City's wetland mapping. Based on the results of this feasibility analysis, the City made the decision to delay the development of a federally approved in-lieu-fee program for wetland impacts and instead develop a buffer in-lieu-fee program administered by the City, as well as develop a list of pre-approved wetland mitigation sites. Pre-approval of mitigation sites is expected to result in more successful mitigation projects and a more streamlined land use permit process.

Lummi Nation Wetland Mitigation and Habitat Bank , Lummi Reservation, WA. *Wetland Ecologist.* Michael assisted the Lummi Water Resources Department with technical editing of a wetland mitigation bank prospectus and with development of the Mitigation Banking Instrument (MBI), which, when approved, will facilitate the establishment of large (1,900 acre) wetland and fish habitat mitigation bank in the Lummi and Nooksack River deltas. Michael conducted vegetation and wetland surveys on the site and worked with Lummi staff on writing and revising the text and figures in the MBI. Michael was also involved in meetings and negotiations with the interagency review team (IRT). The MBI for phase 1 of the project is expected to be approved by the IRT during the first quarter of 2012.

Sound Transit North Link-Northgate Station, Seattle, WA. *Wetland Technical Lead.* Michael is providing wetland delineation, rating, function assessment, impact assessment, and conceptual mitigation design for the Northgate Station portion of the North Link light rail design project. Michael meets regularly with the Sound Transit design team to discuss wetland, stream, and buffer impacts as the team works through several iteration of design modifications.

Big Gulch Sewer Line Restoration Project, Mukilteo, WA. *Restoration and Permitting Lead.* Michael provided wetlands restoration and permitting expertise to a team examining options for the protection and replacement of a sewer line within the stream corridor of Big Gulch in Mukilteo. The sewer line was exposed and undermined by high stormwater flows and was subject to landslides in the lower reaches and was being permitting as an emergency action by City and Federal agencies, and through the regular permitting process by three state agencies. Michael coordinated the permitting effort for updating and finalizing the EIS, Hydraulic Project Approval, City of Mukilteo grading permits, Section 401 Water Quality Permits with Ecology, Section 404 Permits with the Corps, Forest Practice permit with WA DNR, and Critical Areas Alteration Permit from the City of Mukilteo. He coordinated the development of landscape plans for restoration of temporary impacts in wetlands and along the riparian corridor and development of a wetland mitigation plan to compensate for permanent impacts. Michael worked closely with the engineering and design team to minimize Critical Areas impacts from the project.

City of Mukilteo Critical Areas Mitigation Program, WA. *Project Manager.* Michael is leading the team that is developing a Critical Areas Mitigation Program for the City of Mukilteo. Tasks include identifying potential mitigations sites in three sub-basins within the City following a watershed based approach, assessing hydrologic, soil, and biological conditions on the sites, screening sites to develop a prioritized list, developing conceptual mitigation plans for the prioritized sites, and developing a buffer fee-in-lieu program for three of the sites. The program was reviewed by the City Planning Commission and underwent SEPA review in the first quarter of 2012. Final approval is expected within the second quarter of 2012.



Ann Root, Ph.D., CFM

Senior Environmental Planner

EDUCATION

Ph.D.,
Geography/Water
Resources, Oregon
State University

M.S., Geography,
Oregon State
University

B.S., Geographical
Planning, Montana
State University

20 YEARS EXPERIENCE

ACCREDITATIONS

Certified Floodplain
Manager (CFM)

PROFESSIONAL AFFILIATIONS

Washington Chapter
AWRA

Association of State
Floodplain Managers

Northwest Floodplain
Managers Association

Ann is a senior planner specializing in SEPA and NEPA documentation, policy development and analysis, and watershed management. Her NEPA and SEPA experience includes being project manager for a variety of projects including water management programs, transportation projects, and school development projects. Recently Ann's work has focused on the Bureau of Reclamation and Washington Department of Ecology's proposals for water management in eastern Washington, including the Columbia River Water Management Program and the Yakima River Basin Integrated Water Resource Management Plan. She is also working with the Federal Aviation Administration on airport projects in western Washington.

She is a Certified Floodplain Manager and assisted the Chehalis River Basin Flood Authority identify flood mitigation measures and conducted a review of the City of Kent's regulations to determine how they comply with the FEMA Biological Opinion. She has helped develop critical area regulation revisions for several cities in the Puget Sound area, assisted the City of Woodinville with the update of its Shoreline Management Plan, and worked with the City of Redmond to develop and adopt its collaborative, partnership-based Wellhead Protection Ordinance.

Relevant ESA Experience

Tulalip Tribes Qwuloolt Estuary Restoration, Marysville, WA. *Permitting.* Ann is the environmental lead on the stream and estuary wetland restoration plan for a 390-acre area along Ebey Slough at the mouth of Allen and Jones Creeks within the City of Marysville. The goal of the project is to restore the area to tidal estuary habitat by removing levees along the Snohomish River. Ann coordinated with the Tulalip Tribe, NOAA Fisheries, U.S. Fish and Wildlife Service, and the City of Marysville to define the alternatives for the restoration project. She led the local permitting process for the project and is currently assisting with the on-going design to protect infrastructure that would be affected by tidal fluctuations.

Bureau of Reclamation and Washington Department of Ecology Cle Elum Reservoir Pool Raise NEPA/SEPA EIS, WA. *Project Manager.* Ann is leading the preparation of a project-level NEPA/SEPA EIS on a proposal to raise the level of Cle Elum Reservoir by 3 feet. The additional storage in the reservoir would provide additional water for instream flows in the Cle Elum and Yakima rivers. The project is part of the Yakima River Basin Integrated Water Resource Management Plan proposed by Reclamation and Ecology to address water supply and habitat problems in the Yakima River basin. Ann is coordinating with Reclamation staff to define the project and with consultants at other firms to analyze potential impacts from the project.

Bureau of Reclamation and Washington Department of Ecology Kachess Reservoir Drought Relief Pumping Plant and Keechelus Reservoir-to-Kachess Reservoir Conveyance NEPA/SEPA EIS, WA. *Project Manager.* Ann is leading the preparation of a project-level serving as project manager for a NEPA/SEPA EIS to evaluate the impacts of two projects included in the Yakima River Basin Integrated Water Resource Management Plan to address water supply and habitat problems. The Kachess Reservoir Drought Relief Pumping Plant project would construct a pumping plant to access an additional 200,000 acre-feet of water from the reservoir during drought years. The Keechelus Reservoir-to-Kachess Reservoir Conveyance consists of a tunnel that would transfer water directly from Keechelus Reservoir to Kachess Reservoir in order to reduce artificially high flows in the Yakima River downstream from Keechelus Dam to improve anadromous fish habitat. Ann is coordinating with Reclamation staff to coordinate the define the projects and with consultants at other firms to analyze potential impacts from the projects.

Washington Department of Natural Resources Paterson Irrigation Project Feasibility Study, WA. *Senior Planner.* Ann has been providing environmental and permitting support for a Washington Department of Natural Resources proposal to perfect its water rights and increase irrigated acreage in the Paterson, Washington area. The project includes using existing pump systems from the Columbia River and a new pipeline to DNR property. Ann has provided advise on permitting requirements for the different pipeline options.

Spokane County Reclaimed Water Study EIS, WA. *Project Manager.* As part of the process of permitting its regional wastewater reclamation facility, Spokane County prepared a Reclaimed Water Use Study. ESA prepared a Programmatic EIS to help Spokane County determine if use of reclaimed water from the Spokane County Regional Water Reclamation Facility is feasible. Ann served as overall project manager for the EIS and was the lead author for the water resources and groundwater sections. The EIS evaluated impacts of using reclaimed water for irrigation of urban green spaces, industrial uses, wetland creation and enhancement, and aquifer recharge. The Programmatic EIS included an evaluation of potential impacts to ground and surface water, environmental health, fish and wildlife, transportation, and cultural resources.

East Renton Lift Station, Renton WA. *Project Manager.* The City of Renton proposed to eliminate a lift station and convert a segment of its wastewater system to gravity flow. Ann led the permitting the project, including preparation of a SEPA Checklist, a King County grading permit, a JARPA, and developing mitigation plans for stream and wetland buffer impacts. Because the new gravity flow pipe passes through a park owned by King County, the project required coordinating permitting between the City and County.

Southwest Regional Airport Stopway Project. *Project Director.* Ann is coordinating the environmental permitting for construction of a stopway at the end of the main runway of the airport in Kelso. Permitting includes preparation of a SEPA checklist, biological assessment and wetland permits.

Denny Blaine Park Bulkhead Replacement Feasibility Study, Seattle, WA. *Project Planner.* Ann conducted a study for the City of Seattle Department of Parks and Recreation to investigate the feasibility of repairing or replacing a bulkhead at Denny Blaine Park on Lake Washington. She worked with a subconsultant to develop alternatives for the project and to examine the engineering feasibility of the options. She contacted representatives of state and federal resource agencies to determine the likely permitting requirements for the proposed bulkhead structures. Consultation included on-site meetings to describe the proposals and to solicit feedback on design elements, potential impacts, and mitigation. Ann developed a matrix of potential impacts and permit requirements of the alternatives.

Jim Good

Senior Consultant



Jim Good has extensive experience in natural resources and watershed management, including working with water quality and sediment issues and regulations. His technical expertise is in evaluating physical, chemical, and biological effects in aquatic environments. Jim also has experience summarizing and interpreting existing water quality data, developing and implementing sampling and analysis plans to meet project goals, monitoring compliance with quality assurance objectives, modeling pollutant loads, evaluating project impacts, and providing solutions to meet permit requirements. He has specific experience assisting municipal and industrial dischargers with meeting a variety of NPDES permit conditions, including monitoring water, sediment and aquatic biota.

PREVIOUS PROJECT EXPERIENCE

River Restoration Water Quality Monitoring, Snohomish County, Snohomish County, WA. 2005. As Task Manager for the Robe Valley Emergency Watershed Project, designed and oversaw implementation of a program for monitoring construction impacts to the water quality of the South Fork Stillaguamish River. After a flood destroyed several riverside properties in a residential area, the County and local flood control district undertook a project to stabilize the streambank to protect adjacent properties from future flood damage. Prepared a water quality monitoring plan, designed and deployed cable systems to safely lower monitoring instruments in the middle of the river at a wide range of flows, and supervised the collection and reporting of monitoring results to the construction inspector and Ecology.

Enloe Dam FERC License & CWA 401 Certification, Okanogan County PUD, WA. 2005 – present.

As a senior technical specialist, addressed water quality and sediment quality issues in the traditional licensing process for this run-of-river hydroelectric facility on the Similkameen River in north-central Washington. The primary issues include water temperature, dissolved oxygen, total dissolved gas, and sediments contaminated with arsenic and other trace metals. Completed consultations with the Washington State Department of Ecology (Ecology) and the Confederated Colville Tribes; prepared a Quality Assurance Project Plan to monitor water and sediment quality; developed protection, mitigation, and enhancement measures; implemented water quality monitoring; and prepared FERC license application sections. Has been the project's technical leader in negotiating a Clean Water Act §401 certification for the project. This work has centered on in-stream minimum flows in the bypass reach and using site-specific heat balance calculations to show compliance with water temperature criteria. Prepared an overall water quality monitoring plan and quality assurance project plans for the construction and operations phases of the project, and addressed the

EDUCATION

MS, Aquatic Ecology, (University of Idaho),
BS, Forest Management (University of Missouri)

EXPERIENCE IN THE INDUSTRY

30 years

PREVIOUS 10 YEARS EXPERIENCE

GEI: 1 years

Parametrix: 13 years

CERTIFICATIONS

OSHA 8-hour HazWaste Supervisor
OSHA 8-hour HazWaste Refresher
OSHA 40-hour HazWaste Operator
Cardiopulmonary Resuscitation, Standard
First Aid

handling and disposal of excavated sediments. Following an appeal of the §401 certification, prepared written testimony and participated as a witness representing the Okanogan County PUD, successfully defending the critical water temperature analyses.

Rio Ruidoso River Monitoring, Village of Ruidoso and City of Ruidoso Downs, Ruidoso, NM. 2009 – present. As part of a settlement agreement requiring construction of a new wastewater treatment plant (WWTP) to remove nutrients, designed and completed a 4-year Rio Ruidoso Monitoring Program (RRMP) for the Ruidoso Joint Use Board (JUB). The RRMP focused on collecting water quality and biological data, including nutrient concentrations and flows, periphyton (i.e., attached benthic algae) biomass and community composition, continuous hourly dissolved oxygen (DO) concentrations and pH measurements, and benthic macroinvertebrate community indices. Extensive data analyses and interpretations included Nutrient Assessment Protocol evaluations, and a Project Completion Report was submitted to NMED and USEPA to support the development of new TMDL effluent limits for the wastewater treatment plant.

Since the RRMP report was completed in early 2013, has worked closely with the JUB's attorney to provide technical leadership and strategic advice in negotiating a new Total Maximum Daily Load (TMDL) for nutrients in the Rio Ruidoso with New Mexico's Surface Water Quality Board (SWQB). In reviewing and providing written comments to the SWQB on updates to the CWA §303/305 Integrated List, provided evidence that the cold water aquatic life designated use for the lower Rio Ruidoso is unlikely to be accurate, leading to a Use Attainability Analysis.

Boundary Dam Water Quality Monitoring Program, Seattle City Light, Pend Orielle County, WA. 2014 – present. Principal Investigator and Project Manager for a five-year water quality monitoring program required to meet FERC relicensing conditions and CWA §401 permit requirements for the Boundary Hydroelectric Project on the Pend Orielle River. Led the design and deployment of continuous monitoring stations at 12 locations on the river between the Box Canyon Dam tailrace and the Boundary Dam tailrace, plus one tributary station on Sullivan Creek, following requirements of the Temperature Attainment Plan and the Dissolved Oxygen Attainment Plan. Water temperature is measured at 15-minute intervals and dissolved oxygen and pH are measured at 30-minute intervals from July through October, with monthly field events to download results from the data loggers, maintain and calibrate instrumentation, and collect in-situ duplicate measurements with sondes.

Holden Mine Remediation Water Quality Monitoring, Rio Tinto, Holden Village, WA. 2013 – 2014. Managed water quality monitoring during remediation construction activities at the Holden Mine, a federal Superfund cleanup action at Holden Village near upper Lake Chelan. Program included collection of samples from groundwater monitoring wells, pore water samplers, seeps, and Railroad Creek; measurement of water levels and field parameters; lab coordination and delivery of sample data that include metals and conventional water quality indicators. Logistics are particularly challenging with sample holding time requirements and no road access to Holden Village.

Northshore Constructed Wetlands Design, Torres Martinez Coachella Valley, Thermal, CA. 2002 – 2003. Project Manager for the conceptual design and preliminary engineering of a constructed wetland at the north end of the Salton Sea. Participated in meetings with the funding agencies, the Bureau of Reclamation, State of California, and other stakeholders to develop design criteria for constructed wetlands at the mouth of the Whitewater River. Worked with project engineer and senior wetland ecologist to develop three alternatives and cost estimates to meet different design criteria, including water quality treatment, wildlife habitat enhancement, and recreation access.

PROJECT APPROACH CHART: GEI CONSULTANTS TEAM
Engineering, Design & Community Outreach Services for the Lower Dungeness Floodplain Restoration and Levee Realignment

			TEAM										KEY PERSONNEL										
TASK #	TASK	% of Total Effort	GEI	NSD	ESA	Parametrix	Wengler	ERM	KBA	Enviro-Issues	Shreffler	Total % All Firms	Project Manager	Lead Civil Engineer	Lead Geotechnical Engineer	Lead Hydraulic Engineer	Lead Structural Engineer	Lead Fluvial Geomorph	Lead Ecologist	Professional Land Surveyor	Transportation Engineer	Community Outreach	
	BASELINE SCOPE OF WORK													Jeremy Pratt	Alberto Pujol	Jim Nickerson	Leif Embertson	Joe Merth	Tim Abbe	Steve Winter	James Wengler	Happy Longfellow	Sarah Brandt
1	Project Management	8%	100%									100%	400										
2	Project Planning & External Coordination	4%	57%	4%	4%	4%				30%	1%	100%	160	30	30	8	8	30	30		30	120	
3	Towne Road Reconfiguration	10%	10%			90%						100%		16	24		32				160		
4A	Survey & Base Map Development	4%	<1%	<1%	<1%	<1%	99%					100%		8	8	8	8	8	8	240	8		
4B	Geotechnical Exploration and Laboratory Testing	8%	99%	<1%	<1%	<1%						100%		40	140	8	2		8		4		
5	Geotechnical Analysis and Design	12%	99%	<1%	<1%	<1%						100%		40	160	8	2		8		4		
6	Hydrologic, Hydraulic and Geomorphic Design	18%		70%	20%						10%	100%				240		200	200				
7	65% Design and Intermediate Design Evaluations	23%	36%	21%	15%	20%		4%	4%			100%		240	80	180	60	180	120		100		
8	95% Design	11%	39%	21%	15%	21%		2%	2%			100%		80	40	80	24	60	60		60		
9	100% Design	2%	40%	21%	15%	22%		1%	1%			100%		24	10	80	12	40	40		16		
10	Bidder Inquiry Support	<1%	33%	33%		33%						100%		2				2			2		
11	Permitting Support	<1%	50%		50%							100%	8										
TOTAL BASELINE EFFORT		100%																					
OPTIONAL SCOPE OF WORK																							
12	Engineering Monitoring Plan	NA	40%	30%		30%						100%	8	24	8	8	8	16	8		16	16	
13	Support During Construction	NA	40%	30%		30%						100%		4				3			3	3	

- NOTES0.64
1.

This table estimates effort as allocated among team members contributing to the baseline scope of work (Attachment 1) only
Therefore, some team members who provide additional services we propose to offer to the project, do not appear with effort allocated on this chart
2.

Total effort is summed for the baseline scope of work identified in Tasks 1-11 of Attachment A. Since Tasks 12 and 13 are optional they are not included in that sum.
3.

Only hours for "key personnel" specified in RFP Evaluation Criteria D are shown. Staff professionals time whose work would be directed by the lead are not included
4.

The hours represented in this chart approximate about 50% of the anticipated cost (not labor time) of the job, given our very rough initial budget assumptions.

ATTACHMENT 2

STATEMENT OF QUALIFICATIONS CERTIFICATION

(Proposer must use this form – All other formats will be rejected and the Proposer will be considered non-responsive, and the proposal will not be evaluated by the County)

The undersigned is authorized to execute this certification on behalf of the Proposer and certifies on the Proposer's behalf that the information presented in this Statement of Qualifications is a complete and accurate statement of facts and that the Proposer has the financial capability to perform the work which is the subject of this solicitation. The Proposer further certifies that it knows of no personal and/or organizational conflicts of interest prohibited under federal, state and local law.

The Proposer certifies that this Proposal is submitted in accordance with this solicitation and all issued addenda, and that the Proposer agrees to be bound by the same.

~~The Proposer's Small Contractors and Suppliers (SCS) utilization as set forth in the Proposal constitutes the Proposer's commitment, if awarded this contract by the County, to use certified and qualified SCSs firms as required by the Agreement.~~

The Proposer designates

Jeremy Pratt
(name)
Vice President
(title)
206.757.3224
(phone number)

as the person charged with carrying out and reporting the Proposer's use of SCSs to perform Work under this Contract to meet the required percentage established for this Contract.

~~The Proposer certifies that it commits that _____% of the total price of the Contract, as amended, shall be performed by Clallam County Certified SCS firms over the duration of the Contract. Clallam County will not evaluate the proposal and will not execute a contract with a Proposer who does not commit to meeting at least the minimum SCS utilization requirement for this Contract.~~

Proposer J Pratt
Signature Vice President
Title
Date 4/24/15



PROPOSAL
Clallam County
**Design and Engineering Services for
the Lower Dungeness River Floodplain
Restoration and Levee Realignment Project**

DECEMBER 1, 2015