

Don Weitkamp. Ph.D.

Ph.D., Fisheries Biology, 1976

Master of Science, Invertebrate Pathology, 1971

Bachelor of Science, Zoology, 1966

Dr. Weitkamp has been investigating fisheries and associated water quality issues in the Pacific Northwest River system since 1971. His initial research in this area dealt with the water quality issue of supersaturation throughout the Columbia and Snake Rivers. He subsequently worked with various habitat, rearing and passage issues in rivers and estuaries of the Pacific Northwest. This work investigated the effects of various habitat and water quality alterations on fisheries resource. He has designed, managed and directed research investigating aquatic populations and habitat.

Don Weitkamp, Ph.D., is a Parametrix Principal responsible for projects dealing with salmon habitat issues in both estuarine and freshwater. He has conducted numerous salmon habitat projects in the streams and estuaries of the Northwest to analyze the habitat they use in port areas. These investigations have determined how young salmon behave in the habitats provided by altered shorelines such as piers, as well as along more natural shorelines. During the last two years Dr. Weitkamp has been conducting an intensive review of the literature dealing with the estuarine rearing requirements of young chinook and other salmon resulting in an extensive annotated bibliography and draft literature review.

ANALYSIS OF POTENTIAL RESTORATION MEASURES

In the 1970's Dr. Weitkamp began assessing habitat restoration potential for chinook spawning and rearing in both freshwater and estuarine environments. He developed the design and guided monitoring of intertidal rearing habitat in Commencement Bay in 1988 after assessing potential restoration measures for a contaminated sediment site (Tacoma Kraft Mill). Recently he analyzed the habitat restoration potential for the Asarco shoreline site in Commencement Bay. For the past two years he has been analyzing the habitat restoration potential for the disposal site for sediments to be dredged from Thea Foss Waterway. In the Port of Seattle it was his responsibility to analyze and develop potential restoration measures for the southwest Harbor Project at the former Lockheed Shipyard site.

In the early 1980's he helped to develop a chinook spawning area in the Columbia River and the use of pheromones to attract spawners to newly constructed habitat where they had not previously spawned. Recently he assisted the City of Seattle in evaluation of habitat conditions in the Lake Washington, the Green River, and Puget Sound. He is currently leading a project to assess the restoration of a natural flood plain on the Tolt River to provide improved habitat for salmon spawning and rearing.

BIOLOGICAL ASSESSMENTS

Recently Dr. Weitkamp prepared the Biological Assessments for the shoreline protection and habitat construction at the Asarco site, and the development of saltmarsh at the Tahoma site in Commencement Bay. He has prepared a draft BA for the St. Paul Waterway sediment disposal site that involved extensive habitat mitigation as part of the action to fill St. Paul Waterway. He has been serving as a representative for Simpson and Asarco to the EPA team preparing the Commencement Bay BA to support sediment cleanup actions. Recently he prepared draft BAs for a pier restoration project at Point Roberts and for the

Chinese Reconciliation Park development in Tacoma. He is currently working on the fisheries aspects of the BA for the Columbia River channel deepening project proposed by the U.S. Army Corps of Engineers. He has participated in a number of BA's prepared for actions in fresh water habitats. He prepared an assessment of the status of summer chinook in the mid-Columbia region that assisted in preventing this species from becoming listed as threatened.

PARTICIPATION SALMON RECOVERY EFFORTS

Dr. Weitkamp served on the project selection panel for Washington State's Salmon Recovery Funding Board. He was a member of the team working with the City of Seattle to identify limiting factors and potential restoration measures for the City. He is a member of the team selected to assist Snohomish County with ESA issues. Previously he served for two years on the panel of agency representatives and experts established to identify potential habitat restoration sites in Commencement Bay.

GREEN-DUWAMISH R. / ELLIOTT BAY EXPERIENCE

Dr. Weitkamp began conducting research for the Port of Seattle on salmon habitat issues in the early 1980's with the project to construct Terminal 37. He has conducted analysis of spawning and flow requirements, as well as sampling and observational studies to determine the behavior of young salmon in shoreline habitats and the influence of factors such as prey availability and potential predation.

SALMON HABITAT RESTORATION

In recent years, his involvement in projects affecting aquatic resources has lead to the need to develop habitat restoration as an effective means to mitigate the impacts of shoreline development actions and stimulate public support for the actions. His role has been to work with agency representatives and public interest groups to identify and incorporate their interests into these restoration actions. By this means he has helped clients to efficiently get their projects permitted with public and agency support. This has proved to be an effective means to both accomplish development projects and restore previously lost resources.

Dr. Weitkamp has coordinated involvement of regulatory and special interest groups to develop consensus on solutions to allow development projects to proceed. Dr. Weitkamp has developed innovative habitat restoration actions as integral parts of sediment remediation and shoreline development to achieve pragmatic solutions.

HYDROELECTRIC PROJECTS & FISH RESOURCES

He has conducted numerous projects related to the dams in the Pacific Northwest. These include evaluation of the biological impact of implementation of Tacoma's second water right from the Green River, and a subsequent survey of chinook spawning during a low water year. He conducted a 15 year study of fall chinook spawning in the Hanford Reach for an area strongly influenced by dam operation. He has directed studies of survival studies at Wells, Rocky Reach, and Rock Island Dam for passage through spillways and turbines. He has directed studies of genetics and migration survival of hatchery population of salmonids in the mid-Columbia. His experience with dams includes involvement in the development of turbine intake screens, fish bypass and outfall systems, surface collection systems, and transportation of salmon smolts.

REPRESENTATIVE PROJECT EXPERIENCE

Green River Diversion

Evaluated the potential impacts on fisheries habitat in the Green River which would result from the increased withdrawal of water to serve City of Tacoma domestic requirements. This project included evaluating the adequacy of the Washington State Department of Ecology requirements for minimum flows and special conditions for instream flows within the Green River watershed. Dr. Weitkamp provided expert testimony before the State Shorelines Hearing Board on behalf of the City of Tacoma and the Washington State Department of Ecology concerning these water rights issues, the IFIM analysis, and the impact of instream flows on fisheries resources.

Elliott Bay Fish Studies

Conducted a number of studies in the harbor area of the Green-Duwamish River and the Port of Seattle to monitor juvenile salmon and resident fish populations and to evaluate the effects of dredging/filling and other shoreline modifications on marine invertebrates and fish populations. These studies of the benthos and fish have involved sampling to establish population densities and habitat types, measuring effects of habitat alterations and enhancement, and determining fish behavior to evaluate the impacts of dredging, filling and pier construction.

Cedar Falls Resource Evaluation Studies

Coordinated an investigation of fish abundance and distribution in Chester Morse Lake. The study investigated fish distribution both vertically and spatially throughout the lake to evaluate the potential fish entrainment impacts from a proposed power intake. In this project, Parametrix conducted or assisted in all facets of the project. We supplied the Oneida traps, gill nets, and boats used for the sampling and hydroacoustic surveys.

Cedar River Watershed Programmatic EIS

Assigned Principal and technical participant in a programmatic EIS and development of a secondary use plan for alternative uses of Seattle's municipal watershed. This EIS and plan evaluated recreation, education, wildlife, and timber harvest opportunities along with the need to protect water quality. Our role was to help clarify the vision of alternative opportunities and to assess both the benefits and impacts.

Water Supply Options Evaluation

Participated in an evaluation of potential water supply options for the City of Portland Oregon, by assessing potential impacts to aquatic resources. Options from construction of a new dam and reservoir on the Bull Run Watershed to aquifer storage options were evaluated, including withdrawal from the Columbia, Willamette and Clackamas rivers. Effects of water withdrawal, habitat alteration and intake screening options were evaluated.

METRO Water Supply EIS, Portland

Assigned Principal and participant in analysis of environmental impacts associated with various alternatives for increasing the water supply to the Portland metropolitan area. Evaluated fishery impacts to the Clackamas, Willamette, Columbia, and Bull Run Rivers. This project required maintenance of natural resource and recreational values as part of water development.

Yakima River IFIM Studies and Recommendations

Led the effort for a detailed review of instream flow studies to determine the adequacy of available information. Simultaneously, negotiations were conducted between resource agency experts and user group representatives to define biological criteria for the basin. These criteria defined the species and life stages utilizing specific segments of the river system. This information was then used to develop acceptable flow recommendations for the Yakima River Basin and its storage reservoirs.

Salmon Spawning Assessment Vernita Bar

He helped design and conducted extensive studies of fall chinook spawning for over 15 years at the largest natural spawning site in the U.S. (Hanford Reach). This FERC license study evaluated all factors potentially affecting spawning success with special emphasis on spawning habitat and flow fluctuations. It included development of an artificial spawning area to mitigate possible impacts due to flow regulation. These efforts resulted in operating criteria for Priest Rapids Dam, during the spawning period, that minimize the upper elevations at which the chinook spawn, resulting in lower required flows during crucial spring periods.

Habitat Restoration/Forbes Creek

Provided fish habitat analysis and design services to restore natural habitat characteristics to Forbes Creek, a Lake Washington tributary, previously channelized by a large gravel pit development. Habitat and flow control features were incorporated to provide natural stream habitat within a large residential development. This provided recreational opportunities by placing fish spawning habitat within a residential development.

Saltmarsh Habitat Restoration

Provided project management, technical design and agency coordination for habitat restoration on Middle Waterway in Commencement Bay. This joint project by natural resource trustees (state and federal agencies) and Simpson Tacoma Kraft Company is restoring saltmarsh habitat from a previously filled area adjacent to a tideflat. The project is mitigation for past damages to natural resources and sediments. Services included site investigation, design, coordination and monitoring.

Tahoma Salt Marsh Development

Don is currently leading a project to develop the Tahoma Saltmarsh habitat project for the City of Tacoma. This involves site investigations, coordination with Natural Resource Trustees, and design of habitat that will support saltmarsh vegetation along with protected habitat for juvenile salmon migrating along Commencement Bay's shoreline. He is currently assisting with habitat development and preparation of a Biological Assessment for the Chinese Reconciliation Park proposed for the adjacent shoreline.

Sediment Remediation and Habitat Restoration

Managed confined capping of contaminated nearshore sediments associated with a large pulp and paper mill. Prepared sampling plans for characterizing extent of contamination, prepared monitoring plans for construction, and performed post-construction surveys to meet EPA consent decree criteria. Participated in disposal configuration design, which is intended to provide nearshore habitat for juvenile salmonids. Prepared technical documents in support of permit applications and conducted monitoring to verify the project's success since construction in 1988. Helped developed the public participation process that was key to the success of this project.

Southwest Harbor Redevelopment EIS

Assigned principal and leader of marine resource tasks on programmatic redevelopment of the 80-acre area in the southwest harbor (former Lockheed Shipyard). His primary responsibility was to analyze existing intertidal and subtidal habitat value and designed new intertidal habitat areas on a potential nearshore confined disposal site for contaminated sediments to benefit young salmon and other species. He led agency coordination/negotiation on habitat issues to develop acceptable mitigation alternatives. This project involved redevelopment of several sites that included both upland and in-water contamination (sediment contamination). The project became a combined EIS and Remedial Investigation to provide an opportunity for redevelopment in a relatively short time. He helped the Port develop public participation in planning and development of both alternative actions and mitigation.

Under-Pier Habitat, Commencement Bay

Designed and conducted studies of young salmon migrating and rearing under piers in the Port of Tacoma to determine their presence, food sources, and potential predation. Young salmon were found to commonly use areas under pier aprons with food production to be about 50% of that occurring in similar adjacent areas without aprons. Fish predators were not found in the shallow water depths under aprons where the young salmon were found.

Juvenile Salmon Use of St. Paul Waterway, Commencement Bay

Designed and guided sampling of young salmon and marine fishes using the shoreline habitats of St. Paul waterway and adjacent areas of Commencement Bay that will be altered by the proposed sediment containment facility. Young salmon were collected, identified and enumerated at various locations to identify their relative use of different shoreline habitats. He also conducted an extensive literature review to identify the habitat characteristics important to young salmon.

Remediation/ASARCO Smelter Sediments

Assigned Principal for remedial investigation and feasibility study of the upland and marine superfund site contaminated by a copper smelter. Designed marine sampling plan helped owner negotiate with the U.S. EPA, and resolve the area to be remediated. Prepared an underwater video to demonstrate to public and agencies the existing limit of biological effects. Helped develop alternative remediation plans for contaminated areas.

Habitat Restoration/NRDA

Assisted the City of Tacoma with development of a plan to construct new estuarine habitat to satisfy Natural Resource Damage Claims. His role is to develop alternative concepts, coordinate with Natural Resource Trustees and develop a specific habitat restoration plan for an area on Middle Waterway adjacent to a previous project he helped to develop.

Lavaca Bay Habitat Restoration

He helped develop a plan for a habitat restoration project to develop natural resources in both terrestrial and estuarine environments of a large bay on the Gulf of Mexico. This area has previously been contaminated with mercury and other metals as the result of industrial activities. He has prepared a conceptual plan and a video presentation to effectively communicate this concept to the involved parties. This concept will restore natural resource functions as a part of contaminant remediation and provide recreational opportunities for both residents and tourists.

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Fuel Pier Relocation RI/EIS

As assigned principal, Dr. Weitkamp helped the U.S. Navy develop shoreline alternatives and negotiate a sampling program with regulatory agencies. This program identified biological resources and contaminant distributions within an area to be dredged at the existing fuel pier before construction of a new fuel pier. This information and the EIS identified disposal options and mitigation for habitat alterations. He helped the Navy develop agency participation in identifying action alternatives and mitigation.

Hatchery Production Environmental Assessment

Oversaw a NEPA environmental assessment of a large salmon and steelhead hatchery program for a major Columbia River tributary, the Yakima River. Analysis of multiple proposed sites included potential effects on existing fisheries populations, water quality and quantity, land use and recreation, and wildlife. This hatchery system incorporates adaptive management strategies for program development and is being used as a prototype for the entire Columbia Basin.

Hatchery Effectiveness Survey

Assigned Principal for a comprehensive survey to identify non-published research projects conducted in the last 10 to 15 years on all aspects of salmon, trout, and sturgeon culture. The project developed a computerized database that summarizes this information and makes it readily available.

Sultan River Hydroelectric Impacts

Dr. Weitkamp participated in both phases of the evaluation of the Henry M. Jackson hydroelectric project. This included strategy on development of the IFIM analysis during the first phase prior to operation. During the second phase, he helped develop the study plan and analysis for evaluation of salmon passage and spawning to evaluate operational impacts.

Surface Collector Rocky Reach Dam

As a member of an engineering team, leading efforts to incorporate biological criteria in the design of a unique collector for juvenile salmon. This system will incorporate hydraulic characteristics with fish behavior tendencies to provide a practical bypass solution that avoids expensive installation of intake diversion screens. His role is to help develop and evaluate alternative designs by incorporating fish behavior characteristics with hydraulic evaluations.

Intake Screens Wanapum/Priest Rapids Dams

Provided biological expertise to help develop a unique turbine intake screen and bypass system for these hydroelectric projects. Directed prototype testing which has shown favorable results of high diversion rates, very high survival, and very low stress in diverted fish.

Fish Diversion Screen Analysis Rock Island/Rocky Reach Dams

Worked with hydraulic engineers and hydraulic laboratories to develop screen design and fish bypass criteria for these hydroelectric projects. Using biological information together with physical modeling, we developed the appropriate criteria to provide direction for engineers to design successful screens and bypass systems.

Orifice Collection Bypass Gallery

Responsible for biological evaluation of engineering alternatives for moving diverted fish efficiently from dam gatewells to downstream outfalls for Wanapum and Priest Rapids Dams. These evaluations involved

1:4 scale model evaluations of various orifice models together with modeling conduits and control gates. Models were assessed using both hydraulic parameters and small fish.

Fish Bypass Outfall Design

Biologist member of an interdisciplinary team to develop an outfall design and location to be constructed at Wanapum Dam. This effort involved field evaluations, construction of a 1:100 scale model of the dam and three miles of the river, and videotaping both the real site and the model to identify a location that will minimize predation. A 1:10 scale model of the outfall was constructed to evaluate the best means for discharging young salmon.

Rock Island Dam Fish Outfall

Providing biological analysis for the design and location of a fish bypass outfall to be built for the first powerhouse at Rock Island Dam. This assessment is being done through field studies and biological evaluation of the hydraulic conditions. Responsible for agency coordination to involve agency representatives in the development of this project.

Bulb Turbine Survival Study

Under agency direction, the new bulb turbines installed at Rock Island Dam were tested to identify survival rates of salmon and steelhead smolts passing through them. Responsible for designing the holding facilities and marking all smolts to be released. He was also responsible for downstream recovery of smolts by traps and seines.

Priest Rapids Smolt Transportation

Conducted a five-year transportation study of chinook and sockeye smolts that were carried by truck from Priest Rapids to below Bonneville Dam; helped design the studies and supervised the design of the handling/transport facilities, stress studies, and release strategies.

Mid-Columbia System Survival Studies

Controversy over the effects of hydroelectric projects in the mid-Columbia led to the conduct of system mortality studies (5 dams). Responsibilities included coordinating efforts to design the study, mark juvenile salmon, and evaluate the transport and release, stress and short-term survival.

Wells Dam Passage Survival

Designed, directed, and analyzed results for evaluating passage survival of juvenile salmonids passing through turbines and the spillway at Wells Dam. This involved catching and releasing approximately 300,000 juveniles and coordinating recovery of data from multiple downstream dams. The results demonstrated moderately high rates of survival during passage through the dam.

Smolt Bypass Development

Dr. Weitkamp has served as a member of a number of engineering teams developing various systems for bypass of juvenile salmon at hydroelectric projects on Pacific Northwest rivers. He has lead efforts to incorporate biological criteria in the design of a variety of collection and bypass systems, including the unique Rocky Reach collector. These systems incorporate hydraulic characteristics with fish behavior tendencies to provide practical bypass solutions. These projects have included the development of intake diversion screens, associated bypass conveyances, transportation systems, and surface collection systems. He has also helped to develop bypass outfall evaluation criteria and techniques that identify the best locations to release bypassed smolts. His role in these various projects has been to help develop and

evaluate alternative designs by incorporating fish behavior characteristics with hydraulic evaluations. These efforts have included hydraulic model interpretation, prototype design, and field evaluation of prototype systems.

Turbine-Spillway Survival Evaluations

Dr. Weitkamp has directed and participated in a variety of turbine and other hydroelectric survival evaluations. These have included the Rock Island Bulb Turbine, Wells Turbine-Spillway, Rocky Reach Spillway, Mid Columbia System Survival, and Wanapum Turbine-Spillway Survival tests. In these tests we have evaluated turbines and spillways to identify survival rates of juvenile salmon and steelhead passing through them. He has been responsible for designing the holding facilities, marking fish to be released, designing release facilities, downstream recovery of smolts by traps and seines, physiological monitoring of smolts, and interpretation of recovery data. He has provided expert testimony on these studies at a number of FERC hearings.

Priest Rapids Smolt Transportation

He helped design and conducted a five-year transportation study of chinook and sockeye smolts that were carried by truck from Priest Rapids to below Bonneville Dam. This included design of the studies and supervising the design of the handling/transport facilities, stress studies, and release strategies. Sockeye and chinook smolts were collected from both Priest Rapids and Wanapum Dams, marked, and transported by truck to downstream of Bonneville Dam to several release points. Sockeye were also transported to McNary Dam and loaded onto Corps of Engineers barges for transport downstream. These studies included thorough evaluation of stress incurred by the smolts by evaluating blood chemistry parameters.

Dissolved Gas Supersaturation

Dr. Weitkamp has designed long-term and short-term, site-specific monitoring programs for private and public hydroelectric operators in the Columbia River System (U.S. Bureau of Reclamation; Grant, Douglas, and Chelan County PUDs; and Idaho Power Company.) These monitoring studies identified levels of dissolved gas supersaturation, incidence of gas bubble disease, and causes of supersaturation. He conducted in situ bioassay experiments to determine maximum tolerable supersaturation levels under river conditions, and assisted computational modelers in developing a computer model of supersaturation dynamics for a hydroelectric spillway.

Clark Fork River Supersaturation Evaluation

Designed site-specific monitoring programs for the Water Quality Work Group of the interagency FERC relicensing team. Directed studies to monitor dissolved gas supersaturation and its biological effects during exceptionally high flow years. These monitoring studies identified levels of dissolved gas supersaturation, incidence of gas bubble disease, and operational methods to reduce supersaturation.

Columbia River System Supersaturation Monitoring

Designed long-term and short-term, site-specific monitoring programs for private and public hydroelectric operators in the Columbia River System (U.S. Bureau of Reclamation; PUDs for Grant, Douglas, and Chelan Counties; and Idaho Power Company.) These monitoring studies identified levels of dissolved gas supersaturation, incidence of gas bubble disease, and causes of supersaturation.

Supersaturation Bioassays

Designed and conducted two *in situ* bioassay studies in the Columbia River using juvenile salmon to evaluate the effects of supersaturation under natural conditions. These data provided the basis to revise dissolved gas criteria for hydroelectric projects. They demonstrated the differences between laboratory observations and field conditions encountered in the rivers.

Snake-Salmon Rivers Supersaturation Monitoring

Supervised monitoring efforts over a three-year period to identify dissolved gas levels caused by natural conditions and hydroelectric discharges in Hell's Canyon and the free flowing Salmon River. These efforts demonstrated that natural river conditions cause supersaturation at levels sufficient to produce gas bubble disease under laboratory conditions.

Reservoir Drawdown

Parametrix was retained by various port and irrigation interests to evaluate the biological effectiveness and impacts of proposed reservoir drawdowns to aid salmon survival. This effort assessed impacts to juvenile salmon, adult salmon, resident fish, reservoir habitat, wetlands, and water quality. Dr. Weitkamp also developed an innovative proposal for a mobile net pen system as a more effective and less destructive alternative to reservoir drawdowns.

John Wayne Marina EIS

Identified clam, eelgrass, and fish resources to be impacted by this Sequim Bay marina. Provided technical expertise and prepared EIS sections addressing biology and water quality and dredging issues. Helped the Port of Port Angeles negotiate reasonable mitigation actions which allowed the marina to be constructed.