



## MARLENE MEADERS

*Principal Marine Biologist*

Marlene has 21 years of experience specializing in marine and freshwater biology. She manages and implements a variety of fisheries projects, with a focus on shellfish aquaculture. Marlene is a certified senior author for biological assessments, and has written numerous consultations for the Endangered Species Act (ESA), Marine Mammal Protection Act, and Magnuson-Stevens Fishery Conservation and Management Act. She has coordinated with federal, state, and local agencies to complete environmental permitting of marine projects under Sections 404 and 401 and the Shoreline Management Act. Marlene regularly works with both models and field data to produce technical studies that aid in the consultation process. She has conducted over 20 baseline surveys that directly relate to geoduck aquaculture, and is well versed at describing the direct impacts/benefits that an operation or project might have on the environment.

### Representative Projects

**Comparative Habitat Use of Estuarine Habitats with and Without Cultch-on-Longline Gear Present, NOAA Saltonstall-Kennedy Grant NA16NMF4270254, Humboldt County, CA.** *Senior Marine Biologist.* Providing project management support to characterize associations of fish and invertebrates with and without aquaculture in eelgrass and mudflat habitat in Humboldt Bay, California. Providing support on permitting, study design, data collection, and outreach. Field data collection includes the deployment of large scale enclosures to isolate fish in habitats with and without aquaculture gear. Quantification of fish and invertebrate resources is illustrating the diversity and abundance of aquatic resources associated with aquaculture gear and habitat type.

**North Mercer Island Interceptor and Enatai Interceptor Upgrade Project, King County Wastewater Treatment Division, King County, WA.** *Project Manager.* Working with the project engineering team on environmental planning and permitting for a 14,000-foot sewer line replacement. Work includes evaluating potential impacts to sensitive resources along Lake Washington's shoreline and the Mercer Slough Wetland Complex in relation to ESA-listed species, critical habitat, and essential fish habitat. Tasks include conducting preliminary assessment of environmental conditions throughout the project corridor; developing permitting documents for federal, state, and local land use permits; and meetings with resource agencies to discuss the potential impacts and restoration options for the project. Marlene is leading preparation of the following permitting documents: biological assessment, State Environmental Policy Act (SEPA) checklist, critical areas report, and draft mitigation plans. Work on the final permitting documents and response to comments will continue through 2020. Marlene is also working with the project arborist to understand tree removal, protection, and replacement along the pipeline alignment in cities of Mercer Island and Bellevue. An important element of the project includes designing various shoreline ecological enhancements in parks along Lake Washington and Mercer Slough. This restoration furthers Water Resource Inventory Area 8 restoration goals for Chinook salmon habitat.

**Burley Lagoon Cumulative Impacts Review, Taylor Shellfish Farms, Purdy, WA.** *Senior Marine Biologist.* Prepared a cumulative impacts review associated with a change in shellfish aquaculture practices in Burley Lagoon, Pierce County, WA. Although neither the Shoreline Management Act nor Pierce County Shoreline Master Program requires cumulative impacts to be analyzed for activities that do not result in a significant impact to the environment, there has been an interest in providing a



### EDUCATION

M.S., Fisheries Biology, Humboldt State University, Arcata, CA, 2008

B.S., Biological Oceanography, University of Washington, Seattle, 2000

### CERTIFICATIONS

Open Water Diver, PADI, 2014

Senior Author for Biological Assessments, WSDOT, 2011-Present

### EXPERTISE

Marine and Freshwater Biology

Shellfish Ecology

ESA Consultation

Environmental Permitting

Habitat Surveys

### ADDITIONAL TRAINING

Eelgrass Delineation Guidance Workshop, U.S. Army Corps of Engineers, June 2017

### AFFILIATIONS

American Fisheries Society, Member, Since 2001

American Society of Parasitologists, Member, 2009



cumulative impacts review to understand whether a general threshold of impact is being reached within specific areas of Puget Sound associated with shellfish aquaculture. The purpose of the cumulative impacts review is to analyze the likely ecological (e.g., water quality, sediment dynamics, fish) and social (e.g., aesthetics, recreation, noise, light) impacts of the proposed action in the context of, and in conjunction with, other uses and development over time within Burley Lagoon and the surrounding environment (i.e., project region). The review will address the major contributing factors to environmental processes within Burley Lagoon using conceptual models informed by existing literature and data. The cumulative impacts review will be discussed and approved by the Shellfish Interagency Permitting team, which is a multi-agency team funded through the Washington Shellfish Initiative.

**Log Boom and Squire's Landing Park Improvements, City of Kenmore, WA, 2015-Present. Project Manager.** Leading the effort to obtain local, state, and federal permits for 2 waterfront improvements projects that seek to improve the built environment for park users while enhancing ecological functions of existing wetlands, shoreline habitat, and aquatic habitat. Work involves producing critical areas reports, code consistency analyses, and mitigation plans for the redesign of the parks. In addition, the project includes developing a stewardship and habitat conservation plan that will combine the monitoring and maintenance of the proposed mitigation and restoration activities at the parks. The Squire's Landing Park project entails design of a unique aquatic habitat mitigation involving installation of habitat benches along Swamp Creek. These structures will provide in-water benefits to juvenile salmonids. Goals of mitigation design align with restoration goals within the City of Kenmore's Shoreline Master Plan. Managed preparation of various permitting documents for this effort, including biological assessments and other permitting documents. The preferred alternative for both parks was approved by City Council and a public bond measure. A pre-application meeting and several site visits have been held with regulatory agencies including the U.S. Army Corps of Engineers (Corps), Washington Department of Fish and Wildlife (WDFW), Washington State Department of Ecology (Ecology), Muckleshoot Indian Tribe, National Marine Fisheries Service, and U.S. Fish and Wildlife Service. Based on agency feedback, the consultant team is working on the final site design and proceeding with permitting and grant applications.

**Dungeness Bay Biological Evaluation, Taylor Shellfish Farms, Sequim, WA. Project Manager.** Conducted eelgrass delineation and site characterization, as well as a detailed literature review, to identify potential impacts of proposed geoduck aquaculture to tidelands of outer Dungeness Bay in Clallam County, WA. Analysis focused on the influence of direct and indirect effects from geoduck aquaculture, and the avoidance of eelgrass and kelp beds. Issues addressed included invertebrate community distribution, salmonid and forage fish utilization, migration of turbidity plumes, nutrient availability, temperature differences, and other water quality parameters. The significance of this high-profile project is due to the employment of a new approach for permitting geoduck aquaculture operations involving siting geoduck plots with real-time eelgrass monitoring data, a strategy known as adaptive management. This strategy results in mutual benefit to both aquaculture operations and eelgrass/kelp sustainability. The project has thus resulted in a unique partnership among stakeholders to achieve these mutually beneficial goals of maintaining eelgrass sustainability and water quality while ensuring viable geoduck operations.

**Permitting for Maintenance Dredge and Bulkhead Repair, Zittel's Marina, Baird Cove in Olympia, WA. Project Manager.** Providing oversight for project to obtain local, state, and federal permits for maintenance dredging and bulkhead repair work associated with an existing marina. Maintenance dredging would remove sediment deposition from a small stream south of the marina, to allow for vessel passage within the marina. Bulkhead work includes replacement of failing bulkhead and will involve proposed mitigation associated with surf smelt spawning habitat in coordination with WDFW. Work also includes conducting sediment sampling and analysis as part of efforts to ensure that the sediment will be approved for open-water disposal.

**DNR Habitat Conservation Plan for Shellfish Aquaculture, Pacific Coast Shellfish Growers Association (PCSGA), Washington State. Technical Lead.** Provided technical assistance for the Washington Department of Natural Resources (DNR) Aquatic Resources Habitat Conservation Plan (HCP) and EIS. Tasks included planning and conservation of threatened, endangered, and other species of concern that can be affected by activities on state-owned aquatic lands. Focus of work was freshwater and anadromous fish. Also provided comments on the shellfish aquaculture sections of the draft HCP to DNR. Provided minor support to PCSGA as they addressed comments from DNR on the draft HCP.