Stream and Wetland Habitat Restoration

Values

Stream and wetland habitats provide highly valued ecological, recreational, and water quality benefits to society and are crucial to protect threatened and endangered species. These habitats face competing demands for water and land use, and their protection and restoration are key components of integrated water resources planning.

Services

NHC conducts hydrologic, geomorphic, hydraulic, and sediment transport analyses to support preservation and restoration of rivers, creeks, lakes, wetlands, and estuaries. We also provide a full range of design services, from conceptual plans to final construction documents, for projects involving channel restoration, habitat features, and bio-engineered bank stabilization.

OUR SERVICES INCLUDE:

- **Hydrologic modeling and analysis of habitat functions and biological life stages**
- **Geomorphic analysis of channel and wetland evolution and their effects on habitat values**
- **Hydraulic modeling to address channel-floodplain interactions and natural processes**
- **Sediment transport analysis and design of stable channels in natural and modified settings**
- **Support of environmental permitting processes and requirements**
- **Preparation of plans, specifications, and estimates for project implementation**

Technical Approach and Capabilities

NHC applies our technical expertise to understand physical processes, in both natural and man-made settings, that assist in protecting and restoring natural functions in streams and wetlands. We work with aquatic, riparian, and wetland ecologists to integrate physical processes and biological communities for use in restoration planning. We emphasize restoration designs that encourage self-sustaining evolution in both physical and biological systems.

NHC's specialized capabilities in this area include field investigations and hydrographic measurements, spatial and trend analyses in GIS, complex eco-hydraulic analysis using 1-, 2-, and 3-dimensional numerical models, physical scale modeling in three hydraulic laboratories, and a full range of design services using the most current CADD software.

Experience

Geomorphic Restoration

Technical analysis and design to restore natural planforms, recreate and restore floodplains, and maintain channel complexity in a variety of geomorphic and ecological settings.

Constructed riffle on tributary to the Mahatta River, Vancouver Island, BC

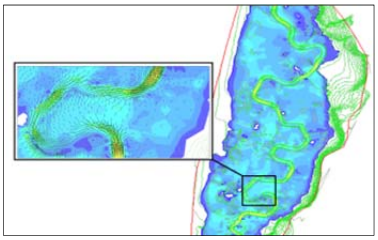
Ecological Mitigation

Planning, detailed design, and monitoring of projects to mitigate unavoidable impacts on stream and wetland environments, including projects targeting specific riparian and aquatic habitat communities and species.

Wilson Canyon restoration, NV

Eco-hydraulics

Hydrologic, hydraulic, and sedimentation analyses specifically designed as indicators of ecological success, such as wetland hydro-period characteristics, tidal marsh evolution, floodplain inundation, and gravel transport for spawning, egg detachment and transport, and fish passage.



Two-dimensional meadow inundation modeling, Lake Tahoe, CA

Multi-objective Restoration

Numerous projects that combine habitat restoration with flood management, recreation, channel stabilization, and infrastructure development, and other objectives.

Special Status Species

Analysis and design services directed towards salmonids, cyprinids, smelt, and other special status fish species, and for restoring aquatic or riparian habitats to support threatened or endangered amphibians, reptiles, and birds.

Engineered log jam on Nooksack River, WA

Benefits

NHC's services promote preservation and restoration of physical conditions and processes to achieve sustainable ecological objectives. We integrate ecological restoration into multi-objective projects backed with sound hydro-technical analysis, thereby providing clients and stakeholders with key information to effectively plan, permit, design, cost, and implement projects.

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NHC provides specialized scientific and engineering services to protect, manage, and develop water resources

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