

Columbia River — Aquatic Resources

The Columbia River is a highly engineered river system with eight major hydropower dams, numerous small dams, diversions, and alterations to its natural state. Over the past 50 years, the river landscape has changed dramatically. Urbanization, heavy logging, and agricultural development have affected the basin's natural resources, including Pacific salmon and other aquatic species. Several salmon and trout populations are (or soon will be) listed as threatened or endangered, and other species such as white sturgeon and Pacific lamprey show potential risk.

In FY 2001, the USGS will provide multidisciplinary science information for resource managers charged with recovery of Pacific salmon, trout, and sturgeon. Four topics are proposed for study: habitat characterization and quality,

restoration of habitat altered by human actions, biological and geophysical factors limiting fish populations, and the socio-economic factors of restoration.

Community leaders, resource managers, and the public must balance options and make difficult decisions about restoring fish populations. To evaluate the available options effectively, decision makers need better scientific information. A recent report released by the Committee on Environment and Natural Resources regarding salmon restoration concluded that the current lack of success in restoration stems in part from an inadequate scientific base in fundamental areas.

The USGS can bring its breadth of science and technology skills to address the problems in the Columbia River Basin

Water quality in the Columbia River Basin has suffered. In 1992, fifty-four percent of the streams surveyed in Washington could not fully support beneficial uses because of pollution.

and the Pacific Northwest. With the proposed funding, the USGS will provide an understanding of the relationship between the behavior of downstream migrating salmon and the hydraulic dynamics of river flow. It will establish a conceptual foundation for restoring natural processes within the river and for monitoring system health. And it will provide regional-scale maps that help define the riverine ecosystem needed to improve survival of critical species and to serve human needs. This kind of scientific information is critical to the preservation of healthy, thriving fish and wildlife populations.

The USGS will examine the aspects of habitat that limit the number of trout, salmon, and sturgeon and the actions needed to improve them. The USGS will produce tools to predict impacts of management choices and provide technical assistance and interpretation of

(Dollars in Thousands)	
National Mapping Program	
Geographic Research and Applications	+\$ 500
Geological Hazards, Resources, and Processes	
Geologic Landscape and Coastal Assessments	
Coastal and Marine Geology	+\$ 500
Water Resources Investigations	
Water Resources Assessment and Research	
Hydrologic Research and Development	+\$ 1,000
Biological Research	
Biological Research and Monitoring	+\$ 2,000
TOTAL	+\$ 4,000

existing data. USGS scientists will work with the agencies of the Department of the Interior that have Columbia Basin management responsibilities. This collaboration will provide understanding of how flow regimes affect natural processes, aquatic and terrestrial ecosystems, and habitat. Risk factors associated with a variety of stressors, including disease and contaminants,

sediment transport, and invasive species will be identified, as will the genetic requirements for re-establishing salmon, bull trout, and cutthroat trout populations.

Decision support tools will be developed to incorporate research on the effects of other ecological factors on fish habitats. Natural and human-induced changes to geologic and hydrologic systems will be

modeled and decision support systems provided to managers who make the decisions to maintain and enhance the overall biological productivity and ecological health of the Columbia River. USGS scientists will analyze and, where needed, improve geographic data sets in salmon-producing watersheds and will help develop, and aid managers in the use of, decision support systems.

As the nation's largest water, earth and biological science and civilian mapping agency, the USGS works in cooperation with more than 2000 organizations across the country to provide reliable, impartial, scientific information to resource managers, planners, and other customers. This information is gathered in every state by USGS scientists to minimize the loss of life and property from natural disasters, contribute to sound economic and physical development of the nation's natural resources, and enhance the quality of life by monitoring water, biological, energy, and mineral resources.