Measures of Ecological Integrity for Salmonid Streams in the Pacific Northwest

Conservation
CS-1154

Background:

Stream ecosystems and their riparian ecotones are among the most important and most threatened natural resource areas in the Pacific Northwest. Military installations in the region often contain valuable aquatic habitat that supports several threatened or endangered species of salmonids. These sensitive areas on military bases need to be properly managed (under the Endangered Species Act) to protect the natural resources they hold while supporting military operational capability within their watersheds.

Objective:

The overall goal of this research project is to determine a suite of ecological-based indicators for stream and wetland ecosystems. Indicators are needed to measure environmental change resulting from a shift in the natural disturbance regime due to the cumulative effects of watershed urbanization, in general, and military operations in particular. A management framework will be developed for stream ecosystem protection and restoration based on active management for natural ecological integrity.

Summary of Process/Technology:

This project investigates a range of physical, chemical, and biological parameters that could be used as tools for assessing changes in natural ecosystem structure and function resulting from military activities within the study watersheds. Military operations impacting aquatic resources will be identified and quantified early in the project. Based on this phase of the analysis process, candidate sites will be selected for detailed reach-level field surveys. These detailed surveys will include riparian corridor characterization, chemical water quality monitoring, instream habitat surveys, hydrologic monitoring, geomorphic surveys, and biological monitoring (salmonids and benthic macroinvertebrates). Natural reference sites also will be identified and quantified as the basis for establishing restoration/rehabilitation target conditions. Data will be analyzed to identify relationships between military operations, watershed conditions, potential measures of ecological integrity, and salmonid population indicators, such as spawning counts and juvenile abundance estimates. The primary means of this data analysis and presentation will be the geographic information system.

Benefit:

This project aims to provide military installations in the Pacific Northwest with the tools to better manage aquatic resources under their jurisdiction. In addition, the protocols developed during this research will allow military base commanders to work more cooperatively with non-military jurisdictions and regulatory agencies on issues of salmonid resource management. The results of this research also will facilitate Department of Defense installations to more effectively respond to salmonid recovery efforts now under way in the region.

Chinook Salmon

Accomplishments:

This is an FY00 New Start project.

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