Developing a Pacific Salmon Population Lifecycle Web Mapping Data Portal

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ABSTRACT

Using open source software, a prototype web data portal was developed to provide Salmon Managers from Federal, state and tribal agencies and the public access to Pacific salmon lifecycle data pertaining to the management of salmon and steelhead populations listed as threatened or endangered under the Endangered Species Act (ESA). This application allows users to select data from specific life cycle stages and to easily map, query and download the data. To enter the application the user selects a species, causing a map of the selected species' ESUs (evolutionary significant units) to open. Users then select specific ESUs, which opens a MSP (major population groups) map and the lifecycle navigator. The navigator is an ellipse shaped jquery tool that links users to data from in-river life history stages. For instance, along the juvenile life history stage, users have access to mapped hatcheries and their associated mapped release sites and release data. Other juvenile data includes trap monitoring data and juvenile travel time and survival data. As the salmon return back to the river, the user can find data on predicted and actual adult return data, smolt to adult survival data (SARs) and specific viable salmonid population data (VSP) from spawning streams, including redd surveys, spawner abundance, etc. The data are presented in maps, tables and graphs and are made available for download. Several of the datasets include spatial temporal data. Several types of spatiotemporal web visualizations were developed for this data, allowing the user to visualize the changes that occur in the selected watershed overtime. All of the data can be queried through forms and/or spatially on the map. In addition, data in the application are available from regional to local scale and include both current and historical information. For instance, the application includes data for the selected species in the mainstem Snake and Columbia Rivers and data for the stream specific populations of the selected species. Data tables and graphs of VSP data are presented when users click on the appropriate spatial unit, such as a major population group, hatchery and associated release sites or stream segment. The data tables provide specific information while the graphs allow the users to view trends in the information. The information provided in the portal assists Salmon Managers in the management and conservation of the salmonid species. For instance, at the regional scale, hatchery release data provide regional Salmon Managers with the information needed to assess the current year's migration of juvenile hatchery fish through

the hydrosystem. In addition release data have been used to access present and historical production releases, timing and magnitude of salmon runs. Local scale data, such as abundance, productivity, diversity and habitat data (VSP data) are used by Salmon Mangers to assess the viability of specific salmonid populations. The open source software used for the prototype includes: MapServer, PostgreSQL, OpenLayers, Weave, timemap.js, GeoExt, Extjs, Dojo, and Jquery. This prototype application is a case study of a regional government open source geographic software stack implementation.

Lynnae Sutton has a BS in Biology with a certificate in Computer Programming and an MS in Geography from PSU. She currently works as an IT Database Management Specialist/Web Developer for the Fish Passage Center.