



Strategy for Development of Project Database

- Project White Paper -

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U.S. Department of Energy
Bonneville Power Administration
Fish and Wildlife Group
Columbia River Inter-Tribal Fish Commission
Idaho Department of Fish and Game
Montana Department of Fish, Wildlife & Parks
Oregon Department of Fish and Wildlife
Pacific States Marine Fisheries Commission
Shoshone-Bannock Tribes
U.S. Fish and Wildlife Service
Washington Department of Fish and Wildlife

Title: Fish and Wildlife Management and Enhancement Projects

Work Statement task #: 1.7

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Principal Author: Duane Anderson, PSMFC

Task description

Task 1.7 Prepare and maintain standardized data relating to fish and aquatic management, to include:

- a) In consultation with BPA, and using data compiled by BPA, maintain and make available standardized data that tracks fish and wildlife enhancement projects funded through the Fish and Wildlife Program.
- b) Locate and prepare summary data on other habitat restoration/protection projects.
- c) Identify the location of Fish and Wildlife Program funded and other applicable watershed planning efforts.
- d) In consultation with the Council, devise a strategy for maintaining applicable data from subbasin planning, model watersheds, and other Fish and Wildlife Program funded watershed initiatives.

Products: Data compiled (July 31) and incorporated into StreamNet data base (September 30).

Background

Millions of dollars have been spent by Bonneville Power Administration (BPA) on fish and wildlife mitigation projects in the Columbia River Basin since the inception of the Fish and Wildlife Program in 1980. Other federal, state, tribal, and private groups have also invested large sums of money in various types of restoration efforts throughout the range of Pacific salmon and steelhead in the Pacific Northwest over the past 20-30 years.

At this time, there is no comprehensive repository for information on completed or on-going mitigation projects in the region. With the current levels of funding for mitigation being tightened, and the growing need to monitor and evaluate the effectiveness of

mitigation projects, it is become increasingly clear that such a database could be very useful to managers and policy makers in the region. The intent would not be to duplicate or circumvent any existing database, but rather to provide project information in the larger context of the Pacific Northwest.

StreamNet, in cooperation with BPA, the Northwest Power Planning Council (NPPC), and the Columbia Basin Fish and Wildlife Authority (CBFWA), is pursuing the development of such a database. The database would be integrated with other components of StreamNet and allow for on-line query, display, and download of all available project data for a particular area of interest. StreamNet is currently working with NPPC and CBFWA to prepare materials related to FY 97 and 98 Fish and Wildlife Program projects. StreamNet has prepared GIS maps depicting the geographic distribution of projects and funding and is preparing a prototype geographic interface that would allow public access to project information within the various Columbia Basin watersheds.

In the future, watershed-level planning and management projects will likely play a significant role in the development of protection and mitigation efforts. Within the Fish and Wildlife Program, BPA-funded "model watershed" projects have been conducted in select locations. That concept has been expanded to additional locations in FY 97. Also, the state of Oregon has initiated a major watershed effort through the Governor's Watershed Enhancement Board and has made watershed level activities the cornerstone of its Coastal Salmon Recovery Initiative.

Currently there is no means to capture data developed through Fish and Wildlife Program-funded watershed projects. The state of Oregon has recognized a need to do this with its watershed program but has not developed a strategy for this.

Current Status and Issues

Federal activities and data availability

The **Bonneville Power Administration** has played a focal role in Columbia Basin mitigation efforts and has the most comprehensive information on completed and on-going mitigation projects of any federal players in the region. Their system, known as the *Environmental Management Information System (EMIS)* contains information on project descriptions, status, cost, locations of work, and types of work. BPA is in the process of digitizing the locations of project activities which will facilitate incorporation of this data into a GIS system. This system is an expansion of a system which was formerly known as the *Project Management Information System (PMIS)*. BPA also maintains a database used for project planning and prioritization. This system is known as the *Annual Implementation Work Plan* database. BPA is currently developing on-line www access to it's

project data and has indicated that it will be available by June, 1997. That system would allow ad-hoc queries and downloads of the data items that met the needs of the StreamNet project database. A conceptual model of the data structure is shown in Appendix A.

The **U.S. Army Corps of Engineers** has been another major player in Columbia Basin mitigation efforts. Primary activities funded by the Corps include modifications of mainstem dams to improve passage conditions, hatcheries (Lower Snake River Compensation Program (LSRCP)), research, spillway modifications, and juvenile fish transportation. LSRCP funding alone currently exceeds \$12 million per year. The Corps does not maintain a consolidated database of this type of information, so it would require a significant level of effort to assemble it.

The **U.S. Fish and Wildlife Service**, the **U.S. Forest Service**, and the **Bureau of Land Management** have each conducted significant numbers of fishery restoration projects. They, too, lack a common repository for information about activities they have sponsored. Select national forests do have project database systems that appear to be quite advanced.

Tribal activities and data availability

The **Bureau of Indian Affairs**, the member tribes of the **Columbia River Inter-Tribal Fish Commission**, and other tribal groups in the region could all be possible sources for fishery mitigation project data. At this time, no comprehensive source of tribal data is available.

State and private activities and data availability

The **Oregon Department of Fish and Wildlife** conducted an inventory of stream habitat improvement projects on private, industrial forest lands for the Oregon Forest Resources Institute and completed a report on these projects in May, 1996. The database they created contains information on nearly 190 habitat improvement projects costing an estimated \$3.2 million. The database is currently being integrated with Oregon's Coastal Salmon Restoration Initiative (see appendix B) and will be an ideal, on-going information source for Oregon. This data is readily available and could be integrated into a projects database with a minimum of effort.

Idaho, Montana, and Washington have not undertaken data compilation efforts such as that described in Oregon. There have, however, been several restoration projects in each of these states. Besides projects related to private timber lands, there have been projects associated with federal hydropower project licensing and re-licensing, and projects conducted by private and community groups. IDFG has been cooperating with other state agencies, the USFS, and others to create a

prototype project database for the Clearwater drainage. Water quality issues appear to be the highest priority for this effort.

Recommendation

Given the relative scarcity of consistent and readily available project data, it is our recommendation to initiate development of a region-wide project database, using Bonneville's EMIS as a prototype database structure. This database would include data on both restoration projects and watershed projects.

A conceptual diagram for the database is shown in Appendix A. The primary table in this structure is the PROJECTS table which contains general information about the project including the description, the contractor, the total cost, the primary focus, the targeted species, etc. The PROJECTS table would be related to a LOCATION table via a one-many relationship. The LOCATION table would contain individual stream reaches or other descriptions of unique locations in which the project was conducted. The LOCATION table would be related via a one-many relationship with a SITE/WORK TYPE table. This table would contain information describing the site (i.e., dam, hatchery, stream, upland, etc.) and the type of work that was conducted at that site (fencing, screening, instream, etc.). The LOCATION table would also be related to the 100K reach file through the common StreamID allowing query and display of this data through the traditional StreamNet methods. This structure would allow for cataloging many locations with a given project, and would allow for cataloging of multiple activities at a given location. Locational data is critical so that the information could be integrated into existing StreamNet query systems and GIS applications. We believe that this structure, with some refinement, would adequately serve the needs of our user community and would be compatible with existing datasets.

This data base effort would result in a consistently formatted regional repository for mitigation project data that could prove invaluable for monitoring, evaluating, and planning of mitigation activities throughout the Pacific Northwest. By providing a consistent and well documented exchange format this effort would not only lead to the capture of historic data, but provide the infrastructure and tools to capture information on on-going and recently completed projects. Combined with universal access to this data through the world wide web, this data base will be a powerful tool for managers and policy makers involved in the development of on-the-ground project priorities and in the monitoring and evaluation of past projects.

We would start the construction of this database using data from BPA's EMIS. We would add the data from the Oregon State database, working in concert with ODFW and the Oregon Coastal Salmon Restoration Initiative so as to maximize efficiency and insure mutual benefit.

We would also conduct data 'mining expeditions' for project data from all of the other potential sources listed above. To promote consistent data compilation, we would also publish a standard project information data exchange format that could be used by all of the various players in mitigation as a template for collecting and reporting information about their own activities. We would encourage those conducting restoration and protection projects to use the StreamNet system as the primary means to store and maintain these data. As one form of encouragement, we could potentially provide a world wide web 'data capture' application which would allow participants to enter data through the www directly into the StreamNet database. (A similar type of application has been developed in California as part of the California Watershed Projects Inventory (http://ice.ucdavis.edu/California_Watershed_Projects_Inventory/) which could serve as a model for StreamNet development.)

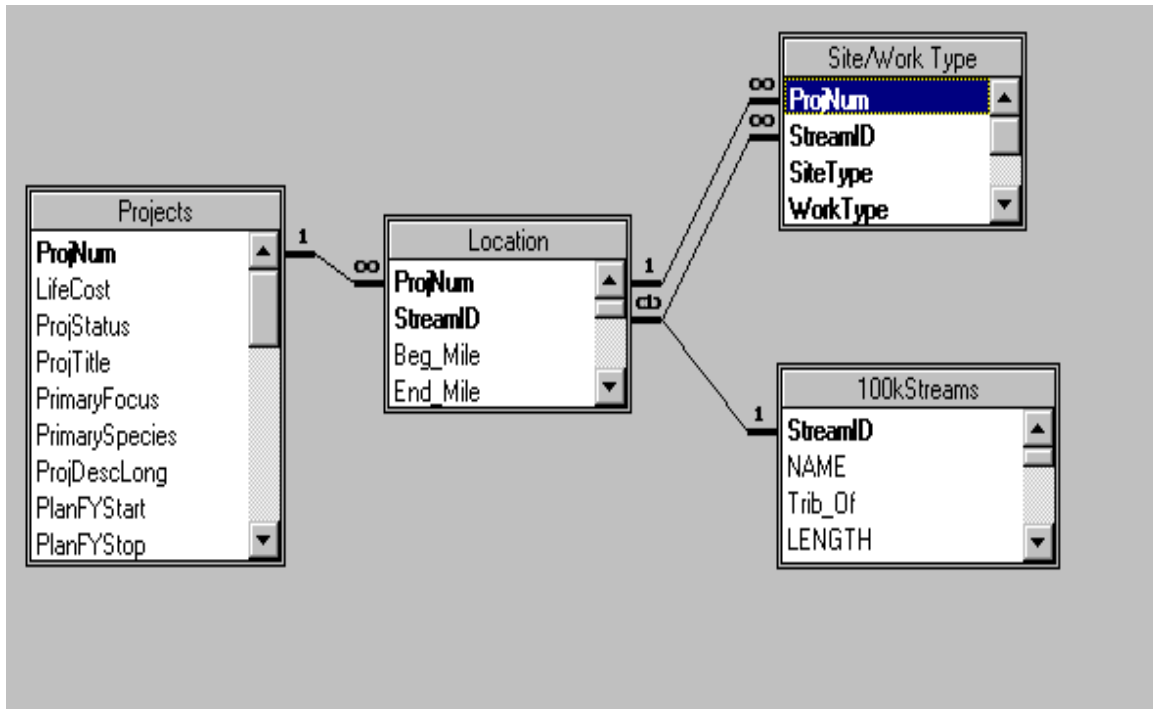
Given available resources, we would plan to establish a data exchange format and complete the BPA project portion of this activity by end of summer 1997. Oregon data would be captured in late FY 97 and early FY 98. Other data would be compiled in FY 98.

The project information database could potentially make a valuable contribution to the Fish and Wildlife Program's monitoring and evaluation efforts. In this regard, it is recommended that StreamNet's project database development activities be closely coordinated with those involved in the development of monitoring and evaluation strategies. At a minimum, these include BPA, NPPC, CBFWA, and the Independent Science Advisory Board.

Conclusion

While the completion of a truly comprehensive project information database will be a daunting task, we feel strongly that there is a compelling need for this type of information and that any effort we can apply to this task would be worthwhile and well received. We will solicit comments on this proposal from the major players in the region and then begin the task of assembling this database.

Appendix A. Generalized Schematic of Proposed Project Database (Modeled after BPA's EMIS system).



Appendix B. Coastal Salmon Restoration Initiative Stream & Watershed Restoration Project Reporting Form

General Directions

What is a Restoration or Enhancement Project?

Restoration or enhancement projects vary widely in size of planning area, types of restoration techniques used, cost, number and types participants, and so on. To be sure to include all restoration efforts in our inventory, we use a broad definition for a “restoration project”. A restoration project is characterized by a spatially discreet planning area (i.e., a single stream reach, several reaches along a stream and adjacent riparian zones, an entire basin, etc.) whose planning effort is by and large distinct from other planning efforts. Several projects may also be nested within a larger planning effort.

Filling Out Project Forms

On the project forms, we are interested in collecting site-level information on restoration activities, meaning that we would like to be able to determine from these forms *what type* of restoration work was done and *where* it was done. We would also like to be able to determine at what level these restoration activities have been planned and implemented (i.e., through a Watershed Council, public/private collaboration, private landowner, federal or state agency, conservation group, etc.).

A project that includes several restoration sites dispersed remotely from one another along a stream or within a basin may require several forms. This is *not* to say that a separate form should be completed for each distinct log structure, riparian planting area, culvert replacement, or alcove. If an accompanying topographic map makes it clear where each of the restoration sites are located, a single form should be sufficient. If more than one form is required, it is not necessary to repeat the same project information on each subsequent form—simply leave lines with repetitive information blank, and indicate which project each form is associated with.

Attach to Project Forms:

- 1) topographic map(s) of project area. Indicate on the map(s) the location of restoration activity (e.g., where logs were placed, alcoves constructed, riparian areas fenced, etc.), and a site location description such as river reach #, stream mile, or other means of locating restoration sites (e.g., relation to a road crossing).
 - 2) (if available) diagrams, plans, or written documentation of project activity;
 - 3) extra sheet(s) for any additional comments regarding project, or if you need more room to answer questions.
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Definitions for Forest Cover Types

The following classifications for forest cover types are classifications identified in the Oregon Department of Fish and Wildlife’s stream survey methods.

Forest Cover Types

- young forest:** recently planted harvest units to stands with trees up to 15 cm dbh.
2nd growth: trees 15-30 cm dbh; mostly dense, rapidly growing, uniform stands.
large timber: trees 30-50 cm dbh.
mature forest: 50-90 cm dbh.
old growth: many trees with 90+ cm dbh and plant community with old growth characteristics.
active harvest: active timber management/logging; not yet replanted.
partial cut forest: selection cut or shelterwood cut with partial removal of large trees; combination of stumps and standing timber.
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Coastal Salmon Restoration Initiative

Stream and Watershed Restoration Project Reporting Form

Please read the General Directions, and be sure to include a topographic map as indicated in "Attach to Project Forms".

1) DATE _____ 2) YOUR NAME & AFFILIATION _____

Participant Information

3) LANDOWNER (if project includes more than one landowner, list on a separate sheet)
 LANDOWNER NAME _____ CONTACT _____
 ADDRESS _____ PHONE _____ /FAX _____

4) OWNERSHIP (if mixed ownership, indicate %) _____ Federal _____ State _____ Private

5) Who planned/implemented project? **organization name** / **project contact person** / **phone number**

Watershed Council _____ / _____ / _____

State Agency _____ / _____ / _____

Local Agency _____ / _____ / _____

Federal Agency _____ / _____ / _____

Private Landowner _____ / _____ / _____

Conservation Group _____ / _____ / _____

Other _____ / _____ / _____

6) Which organization provided TECHNICAL SUPPORT/EXPERTISE: _____

Stream/Watershed Information

7) STREAM NAME _____ (if various streams, fill out separate form for each. See General Directions- "Filling Out Project Forms") TRIBUTARY OF: _____
 BASIN _____ SUBBASIN _____
 PROJECT LOCATION: T. _____ R. _____ Sec. _____ LAT/LONG (if available) _____

8) STREAM WIDTH (baseflow) _____ STREAM GRADIENT (%) _____
 STREAM DOMINANT SUBSTRATE
 ___ bedrock _____ cobble (baseball to bowling ball, 64-256mm) ___ sand
 ___ boulder (bowling ball or bigger, 256mm+) ___ gravel (pea to baseball, 2-64mm) ___ silt/fines

9) LAND COVER TYPE (indicate % of contributing drainage area): *see directions for forest type definitions*

___ young forest ___ mature forest ___ partial cut forest ___ ungrazed grasslands ___ barren
 ___ 2nd growth ___ old growth ___ cropland ___ shrub ___ urban
 ___ large timber ___ active harvest ___ pasture ___ wetland ___ other (describe)

10) LAND USE: ___ forest ___ grazing ___ rural residential ___ urban industrial/commercial
 ___ orchard ___ row crop agriculture ___ urban residential ___ wildland recreation/conservation

Project Information

11) PROJECT NAME: _____

12) PROJECT DATES: Start _____ Completion _____

13) FUNDING SOURCE(S) and % of funding provided by each source: _____

14) COST: Estimated or Actual Labor \$ _____ Equipment \$ _____ Material \$ _____
 TOTAL COST \$ _____

15) What does the project INTEND TO ACCOMPLISH (i.e., GOALS of project, LIMITING FACTORS being addressed, salmonid LIFESTAGES being affected, and expected TIME FRAME of project impact)? _____

16) Which SPECIES does this project intend to benefit? (Identify primary and secondary species if applicable)

___coho ___steelhead ___chinook ___cutthroat ___ other, please specify _____

17) Is ASSESSMENT or MONITORING included in this project? ___Yes ___No If yes, check below.
 ___fish sampling ___other aquatic or terrestrial species ___physical instream habitat ___water temperature
 ___spawning counts ___bug sampling ___riparian vegetation ___water chemistry ___other (specify)
 Brief description of monitoring (methods and objectives, pre- and/or post treatment, etc.) _____

Does monitoring include 1 or more CONTROL REACHES or WATERSHEDS (i.e., same slope, size, ecoregion, but untreated)?
 (If yes, please describe) _____

Project Activity Summary

Fill in the project activity information below. List the restoration activities marked above each table and fill in the columns where applicable. Use another sheet of paper to describe activities if necessary.

18) **INSTREAM RESTORATION ACTIVITIES:** Did the project include instream restoration activities?
 TOTAL LENGTH of stream treated by instream activities _____
 ___LWD ___rootwads ___side channels ___log weirs ___pools created ___upgrade culverts ___stabilize bank
 ___boulders ___brush bundles ___alcoves ___rock weirs ___deflectors ___remove culverts ___fish ladders
 ___spawning gravel placement ___rock gabions ___other (please specify) _____

ACTIVITY	# and SIZE or AMOUNT of FEATURES	WHAT TECHNIQUES were used?

19) **RIPARIAN VEGETATION MANAGEMENT:** Did the project include riparian vegetation management?
 ___conifer planting ___hardwood conversion ___livestock rotation ___beaver management (specify)
 ___hardwood planting ___fencing/livestock exclusion ___off-channel watering ___wetland enhancement/creation
 ___other (please specify) _____

ACTIVITY	LENGTH & WIDTH of Riparian Zone TREATED (one side or both sides of stream?)	DESCRIPTION of Application

20) **UPSLOPE MANAGEMENT:** Did the project include any upslope stabilization efforts?
 ___road upgrade/maintenance ___maintenance of ditches/drainage culverts ___drainage culverts replaced/installed
 ___improvement in road design & construction ___changes in harvest/land management practices (please specify)
 ___road decommission/obliteration ___other stabilization efforts (specify) _____

ACTIVITY	MILES or AREA TREATED/IMPROVED	# of FEATURES or IMPROVEMENTS

21) What FACILITATED and what COMPLICATED implementation/completion of this project? What would improve the process?

