Proposal for StreamNet Assistance With FWP Project Tracking

discussion draft - prepared by Drew Parkin and Duane Anderson
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INTRODUCTION: STREAMNET ROLE IN FWP

1. Maintain long-term trend data - and other baseline data - for use in M&E and other FWP activities.
2. Maintain data infrastructure and data access system for use by FWP.
3. Provide technical support to FWP decision makers.
4. Provide technical support to individual projects
5. Provide data link between FWP and other appropriate regional fish and wildlife management activities.

THE PROJECT TRACKING PROPOSAL IN CONTEXT

The StreamNet project tracking proposal has two components - creation of a region-wide comprehensive project tracking system and specific assistance on the annual project selection process.

1. The region-wide project tracking proposal responds to the ISRP's concern that it is difficult to evaluate Fish and Wildlife Program project proposals without placing them in the context of 1) past FWP activities, 2) future FWP activities, and 3) related non-FWP activities.

2. The FY99 project development proposal responds to the ISRP's concern that there is need for more analytic capabilities, e.g., sort projects by Program measure, objectives, etc. It also responds to the concern that there is need for more coordination and clarity in moving the project selection process through its various phases.

1. PROPOSAL FOR REGION-WIDE PROJECT TRACKING

Objective: Establish and maintain the capability to track Pacific Northwest region fish and wildlife protection and restoration projects including but not limited to the Fish and Wildlife Program. Tasks include:

- **Data Exchange Standards**. Establish interagency data exchange standards to be used in developing a comprehensive dataset on Pacific Northwest fish and wildlife protection and restoration projects.

- **Historic FWP Projects**. Compile a dataset of historic Fish and Wildlife Program protection and restoration projects.

- **New FWP Projects**. Undertake a systematic effort to integrate FY 98 and future year Fish and Wildlife Program protection and restoration projects into this dataset.

- **Other Projects**. Expand the scope of the dataset to include protection and restoration projects undertaken through (in order of priority):

    - the Federal MOA on regional fish and wildlife funding
    - Federal activities (USFS, BLM, EPA) not covered by the federal MOA
    - state initiatives, with special emphasis on those aimed at preempting ESA listings
    - private initiatives (conservation groups, timber companies, etc.)

- **Develop User Interface for Project data**. Expand the scope of the current StreamNet internet based data access system to incorporated historic project data. Query capability would include by state, county, subbasin, stream, hydrologic unit boundary, and others as deemed appropriate (ie ESU, land ownership, etc.). Project data could be viewed along with other StreamNet datasets (escapement, harvest, hatchery, habitat, etc.) to provide a comprehensive view of project activity and population response.

2. PROPOSAL FOR DEVELOPING THE FY 99 PROGRAM

Objective: Provide technical support to BPA, CBFWA, and NWPPC in the development, analysis, presentation, and monitoring of FY 99 (and future) FWP projects. The actual tasks to be undertaken by StreamNet would be developed in consultation with BPA, CBFWA, and NWPPC. Potential tasks include:

- **Project Solicitation**. Assist BPA, CBFWA, and NWPPC to establish an effective means to secure and catalog FY 99 project proposals. Steps include:

    a. Revamp project description form to address ISRP comments (i.e., expanded information on scientific foundation, increased capacity for cross-project analysis, and information on non-FWP activities).
    b. Create a template for efficient entry of project descriptions.
    c. Create a means for applicants to enter project descriptions via the Internet or a distributed electronic data form.
    d. Compile completed data forms for use by BPA and, subsequently, CBFWA and NPPC.

- **Track Project Selection Process**. Maintain a record of the project selection process. Steps include:

    a. Maintain a step-by-step log of each phase of the project selection process, including a list of projects and project budgets, and highlighting proposed changes. (The idea here is to get away from the confusion regarding which set of numbers are accurate and to allow decision makers and the public to better follow the process.)

- **Analysis of Proposals**. Assist BPA, CBFWA, ISRP, and NWPPC in analyzing project proposals. Steps include:

    a. At each step of the process prepare a series of "data sorts" that array proposed projects by subbasin, FWP measure, focus, sponsor, etc. and that places projects in the context of past projects and projects undertaken or proposed by others.
    b. Prepare summary financial statistics.
    c. Prepare custom arrays under direction of ISRP for use in evaluating the CBFWA recommendation.
    d. Prepare custom arrays under direction of NWPPC for use in evaluating the CBFWA recommendation and ISRP analysis, including linking projects to the FWP's biological datasets where applicable.

- **Public Information**. Prepare appropriate Internet products, to include:

    a. A summary of all proposals as received by BPA (spring).
    b. A summary of CBFWA's recommendations (early summer).
    c. A summary of NWPPC's recommended Program (late summer).
    d. A summary of NWPPC's Program as adopted (September).
    e. A summary of the Program following BPA's negotiation of contracts.

- **Monitoring**. Assist in monitoring results of projects. Steps include:

    a. Provide access to project-related reports via the Internet and the StreamNet Library.
    b. Devise an electronic system for tracking project progress and results. (BPA lead)
    c. Incorporate progress and results into the project tracking dataset.

Attachments:

1. Project Tracking White Paper
2. Proposed Data Exchange Format

These attachments provide details on the region-wide project tracking proposal. The data exchange format would also be directly applicable to the annual project selection process.

ATTACHMENT #1: Project Tracking White Paper

Strategy for Development of Project Database

- Project White Paper -

Revised Draft: May 1997

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

Date: February 1997, revised May 1997

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 a 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.

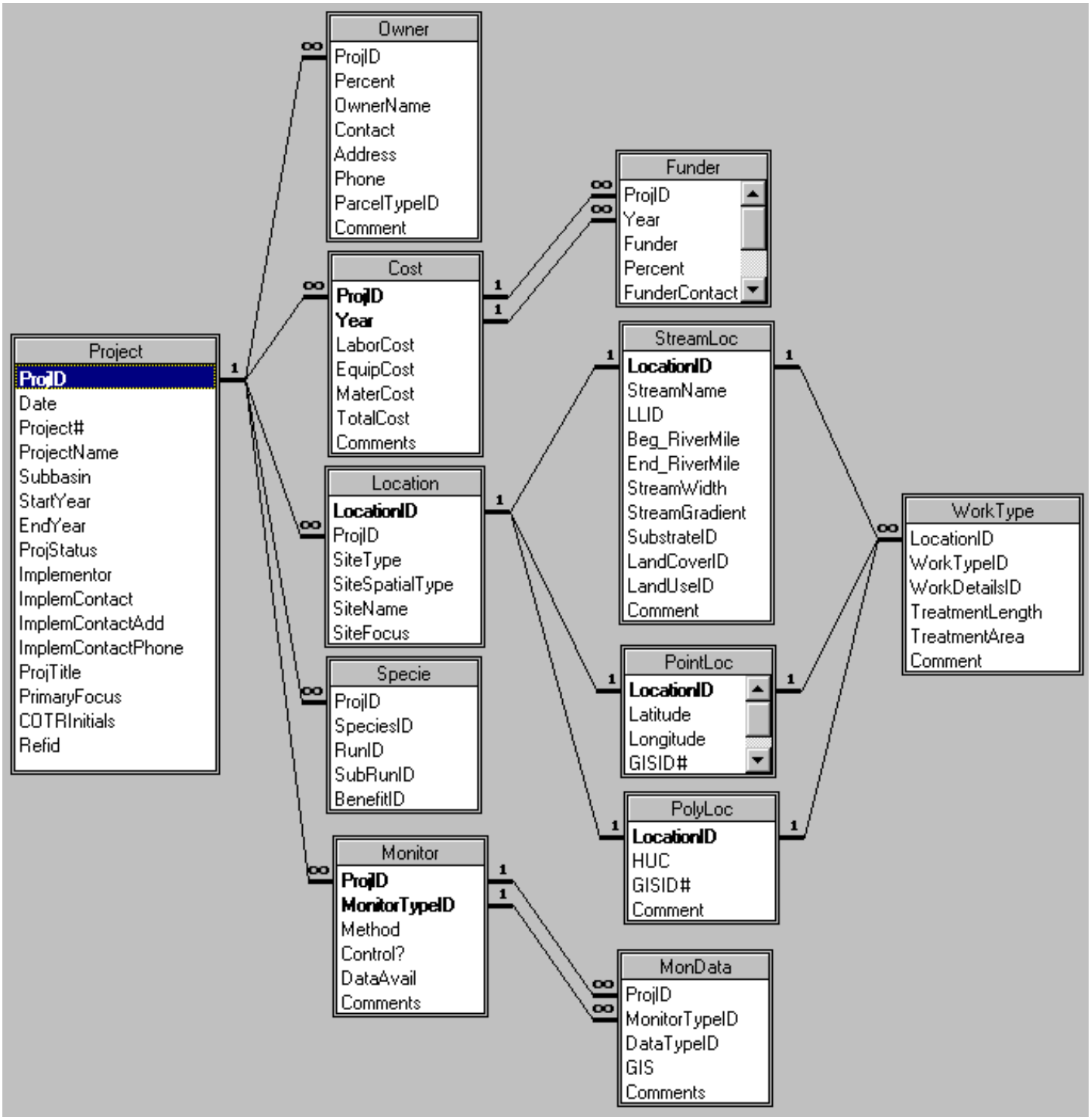
The project information database could potentially make a valuable contribution to the Fish and Wildlife Program's monitoring and evaluation efforts. In this regard, it is recommended that StreamNet's project database development activities be closely coordinated with those involved in the development 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.

ATTACHMENT #2: Proposed Data Exchange Format for Projects Data

The following is the proposed exchange format for Projects data. The entity relationship diagram below outlines the data structures and design for the Projects database.



1. Project Table

Smallest Spatial Resolution: Stream segment
Largest Spatial Resolution: Supercode
Time Span for Reporting: Annual

Field Name	Field Description	Req	Max Width	Type	Codes/ Conventions
General Project Information					
ProjID	StreamNet Primary key for the projects database that uniquely identifies a project	Yes	7	Long Integer	Number ranges will be assigned by agency
Date	Date data on project submitted	Yes	10	Date	mm/dd/yyyy
FrequencyID	How often the project is updated	Yes	1	Char	1=Yearly 2=Monthly 3=Weekly 4=Daily 5=Other
Project#	Agency Number associated with project (if any)	No	Variable	VarChar	Codes from agencies would be stored verbatim
ProjectName	Official name of project	Yes	255	Text	
Subbasin	The primary drainage basin in which the project is located	No	50	Text	Lookup tables will be provided
StartYear	Year the project was implemented	Yes	4	Integer	Project start year must be >1800 and consist of four digits; 2001
EndYear	Year the project was or will be completed	No	4	Integer	Project end year must be >1800 and consist of four digits; 2001
RefID	The reference ID for the project data source	Yes	8	Long Integer	
Status	The status of the project	Yes	3	Integer	1=Completed 2=Ongoing 3=Planned
Participant Information					
Implementer	Organization implementing and managing project	Yes	200	Text	**The following fields re. Implementer may require a one to many treatment which would include a percentage by implementers**
ImplemContact	Name of primary implementor contact or project manager	No	50	Text	Last Name, First Name

ImplemContactAdd	Mailing address of same	No	50	Text	Number, street, city, state
ImplemContactPhone	Phone number of same	No	10	Text	(Area code)prefix-number
ImplemTypeID	Code for planner or implementor	No	3	Integer	1=Watershed Council 2=State Agency 3=Local Agency 4=Federal Agency 5=Private Landowner 6=Conservation Group 7=Other
Comments		No	NA	Memo	
Goals/Monitoring Information					
ProjDescription	Detailed project description including 1) Goals and Objectives of the project, 2) Limiting factors addressed by the project, and 3) time frame for expected benefits	Yes	200	Memo	**This section will probably need some additional definition**
MonitoringID	Is assessment or monitoring included in this project?	Yes	1	Logical	If Yes, fill in appropriate entries in monitoring table
Analysis	Things that facilitated, complicated, and would help the project	No		Memo	

2. Ownership Table - One to Many Relationship with Project Table via ProjID

Smallest Spatial Resolution: NA
Largest Spatial Resolution: NA
Time Span for Reporting: NA

Field Name	Field Description	Req	Max Width	Type	Codes/ Conventions
ProjID	StreamNet Primary key for the projects database that uniquely identifies a project	Yes	7	Long Integer	Number ranges will be assigned by agency
Percent	Percentage of project site comprised by this parcel	Yes	5	Float	
OwnerName	Name of primary owner of project site	No	50	Text	Name of primary land owner, e.g. U.S. Forest Service, John Doe, etc.

Contact	Name of person to contact for information	No	50	Text	Last Name, First Name
Address	Mailing address of owner	No	50	Text	Number, street, city, state
Phone	Phone number of owner	No	50	Text	(Area code)prefix-number
ParcelTypeID	Code describing the ownership category for the parcel	No	3	Integer	1=Federal 2=State 3=Tribal 4=Private
Comments		No	NA	Memo	

3. Cost Table - One to Many Relationship with Project Table via ProjID
Smallest Spatial Resolution: NA
Largest Spatial Resolution: NA
Time Span for Reporting: Annual

Field Name	Field Description	Req	Max Width	Type	Codes/ Conventions
ProjID	StreamNet Primary key for the projects database that uniquely identifies a project	Yes	7	Long Integer	Number ranges will be assigned by agency
Year	Calendar or fiscal year of project funding	Yes	4	Integer	
LaborCost	Cost of labor for project for year	No	8	Number	Rounded to dollars
EquipCost	Cost of equipment for the project for year	No	8	Number	Rounded to dollars
MaterCost	Cost of materials for the project for year	No	8	Number	Rounded to dollars
TotalCost	Total cost of project for year	Yes	8	Number	Rounded to dollars
Comments	Comment Field	No	NA	Memo	

4. Funder Table - - One to Many Relationship with Cost Table via ProjID and Year
Smallest Spatial Resolution: NA
Largest Spatial Resolution: NA
Time Span for Reporting: Annual

Field Name	Field Description	Req	Max Width	Type	Codes/ Conventions
ProjID	StreamNet Primary key for the projects database that uniquely identifies a project	Yes	7	Long Integer	Number ranges will be assigned by agency
Year	Calendar or fiscal year of project funding	Yes	4	Integer	
Funder	Name of primary funding source	Yes	50	Text	
Percent	Percentage of total annual funding provided by funder	Yes	5	Number	
FunderContact	Name of primary funder contact or project manager	No	50	Text	Last Name, First Name
FunderContactAdd	Mailing address of same	No	50	Text	Number, street, city, state
FunderContactPhone	Phone number of same	No	10	Text	(Area code)prefix-number
Comment		No	NA	Memo	

5. Location Table - One to Many Relationship with Project Table via ProjID
Smallest Spatial Resolution: Point
Largest Spatial Resolution: Polygon
Time Span for Reporting: Annual

Field Name	Field Description	Req	Max Width	Type	Codes/ Conventions
LocationID	Unique ID of particular project location	Yes	6	Integer	
ProjID	StreamNet project ID	Yes	7	Long Integer	Number ranges will be assigned by agency

SiteTypeID	General classification of project site	No	2	Integer	1=Springs, watering holes 2=Basin (i.e. whole watersheds) 3=Classroom (mtg room. Information center) 4=Dam (hydro-electric, reclamation, etc.) 5=Roads, bridges, culverts 6=Riparian zone 7=Right of way (transmission line) 8=Hatchery (acclim. ponds, release site) 9=Labs (research centers, etc.) 10=Mine, dredged site 11=Office (business, hdqrs., university) 12=Passage (ladders, screens) 13=Reservoir (incl. lakes, ponds,etc.) 14=Stream (river, creek, canal, etc.) 15=Upland (wildlife sites, veg mgt. Sites) 16=Wetland (marsh, bog, swamp) 17=Other 99=Unknown
SpatialType	Code describing the spatial type of the site, and hence, the table that will be used for specific location data	Yes	2	Integer	1=Stream section (StreamLoc) 2=Stream Point (StreamLoc) 3=Non stream point (PointLoc) 4=Polygon (PolyLoc)
Site Name	Name used by project to identify the site	Yes	15	Char	EG.: 1A, Dahlonega, PSMFCHQ
Comment	Comment Field	No	NA	Memo	

6 Stream Location Table - One to Many Relationship with Location Table via LocationID

Smallest Spatial Resolution: Stream Segment
Largest Spatial Resolution: Stream Segment
Time Span for Reporting: Annual

Field Name	Field Description	Req	Max Width	Type	Codes/ Conventions
LocationID	Unique ID of particular project location	Yes	6	Integer	
StreamName	The 100K standard stream name	Yes	50	Text	Lookup tables will be provided in a variety of formats.

LLID	The IRICC standard LatLong Stream ID	Yes	13	Char	Lookup tables will be provided in a variety of formats.
Beg_RiverMi	The river mile of the starting location of the stream work	No	4	Float	Mileages in this table would represent the total extent of any contiguous stream section where work was being conducted. For example, if 12 continuous miles of a stream were worked on, with various treatments within that 12 miles, all 12 miles would be represented in this table, while lengths of the various treatment types within the 12 miles would be stored in the WORKTYPE table.
End_RiverMi	The river mile of the ending location of the stream work	No	4	Number	
Stream Width	Average width of treament area in FEET	No	4	Number	
Stream Gradient	Gradient of the stream segment	No	3	Number	Expressed as a percentage
SubstrateID	Dominant substrate of the stream work location	No	2	Number	1=bedrock 2=boulder (bowling ball or bigger, 256+) 3=cobble (baseball to bowling ball, 64-256mm) 4=gravel (pea to baseball, 2-64mm) 5=sand 6=silt/fines 99=Unknown
LandCoverID	Dominant land cover of the stream work location	No	2	Number	1=young forest 2=2nd growth 3=large timber 4=mature forest 5=old growth 6=active harvest 7=partial cut forest 8=cropland 9=pasture 10=ungrazed grasslands 11=shrub 12=wetland 13=barren 14=urban 15=other 99=unknown

LandUseID	Dominant land use of the stream work location	No	2	Number	1=forest 2=orchard 3=grazing 4=row crop agriculture 5=rural residential 6=urban residential 7=urban industrial/commercia 8=wildland recreation/conservation 9=other 99=unknown
Comment	Comment field	No	NA	Memo	

7. Point Location Table - One to Many Relationship with Location Table via LocationID

Smallest Spatial Resolution: Geographic Point
Largest Spatial Resolution: Geographic Point
Time Span for Reporting: Annual

Field Name	Field Description	Req	Max Width	Type	Codes/ Conventions
LocationID	Unique ID of particular project location	Yes	6	Integer	
Latitude	Latitude coordinate of point in degrees, minutes, seconds	Yes	7	Float	
Longitude	Longitude coordinate of point in degrees, minutes, seconds	Yes	8	Float	
GISID	GIS identifier linked to point coverage, if provided	No	8	Integer	
Comment	Comment field	No	NA	Memo	

8. Polygon Location Table - One to Many Relationship with Location Table via LocationID

Smallest Spatial Resolution: Polygon
Largest Spatial Resolution: Polygon
Time Span for Reporting: Annual

Field Name	Field Description	Req	Max Width	Type	Codes/ Conventions
LocationID	Unique ID of particular project location	No	8	Counter	Unique identifier for table.
Project_ID	Numerical code which uniquely identifies a project	No	8	Number	Foreign key to the project table; one-to-many relationship
HUC	Hydrologic Unit Code associated with project	Yes	8	Text	Foreign key to 4th code HUC.
Comments	HUC specific comments	No	NA	Memo	

9. Work Type Table

Smallest Spatial Resolution: Stream segment
Largest Spatial Resolution: Polygon
Time Span for Reporting: Annual

Field Name	Field Description	Req	Max Width	Type	Codes/ Conventions
LocationID	Unique ID of particular project location	Yes	6	Integer	

WorkTypeID	Code for general work category	Yes	3	Integer	1=Instream Work 2=Riparian Work 3=Upland Work (4-23 from BPA) 4=Survey, study, research 5=Screen / ladder (model, plan, const) 6=Site restoration (mine, road) 7=Site purchase (study, manag. plan) 8=Building (plan, construction) 9=O & M 10=Education, training, workshops 11=Fish protection (pred control, law enf) 12=Audiovisual (video, display) 13=Management / administration 14=Water management (release, store) 15=Collect, raise / transport / plant fish 16=Consult, model / plan devel, gather data 17=Rental /purchase (rooms, equipment) 18=Secretarial, misc. overhead 19=Vegetation management (plant, log, burn) 20=Wildlife manage., trapping, transport 21=Water site develop. (spr, pond, tank) 22=Ag or Grazing modification 23=Harvest control, buy back 99=Unknown

WorkDetailsID	Treatment Type Details	Yes	3	Integer	**Instream Treatments** 1=large woody debris 2=rootwads 3=side channels 4=log weirs 5=pools created 6=upgrade culverts 7=stabilize bank 8=boulders 9=brush bundles 10=alcoves 11=rock weirs 12=deflectors 13=culvert removal 14=fish ladders 15=fish screens 16=spawning gravel placement 17=rock gabions 18=fish traps 19=other instream treatment **Riparian Treatments** 20=conifer planting 21=hardwood conversion 22=livestock rotation 23=beaver management (specify) 24=hardwood planting 25=fencing/livestock exclusion 26=off-channel watering 27=wetland enhancement/creation 28=Other riparian treatment **Stabilization Treatments** 29=road upgrade/maintenance 30=maintenance of ditches/drainage culverts 31=drainage culverts replaced/installed 32=improvement in road design & construction 33=changes in harvest/land management practices 34=road decommission or obliteration 35=Other stabilization treatment 98=N/A 99=Unknown

TreatmentLength	Total length of stream treated in feet	No	6	Integer	
TreatmentArea	Total area treated in acres	No	6	Integer	
Comment	Comment field	No	NA	Memo	

10. Species Table - One to Many Relationship with Project Table via ProjID

Field Name	Field Description	Req	Max Width	Type	Codes/ Conventions
ProjID	StreamNet project ID	Yes	7	Long Integer	Number ranges will be assigned by agency
SpeciesID	Species code for affected species	Yes	3	Number	Use StreamNet standard species codes
RunID	Run code for affected run	No	3	Number	Use StreamNet standard run codes
SubrunID	The subrun of the target species	No	3	Number	Use StreamNet standard sub run codes
BenefitID	Is species a primary or secondary beneficiary of project	Yes	1	Number	1=Primary target species 2=Secondarily affected species: positive effect 3=Secondarily affected species: detrimental effect

11. Monitoring Table - One to Many Relationship with Project Table via ProjID

Smallest Spatial Resolution: Project
Largest Spatial Resolution: Project
Time Span for Reporting: Annual

Field Name	Field Description	Req	Max Width	Type	Codes/ Conventions
ProjID	StreamNet Primary key for the projects database that uniquely identifies a project	Yes	7	Long Integer	Number ranges will be assigned by agency

MonitoringID	Classification for general monitoring type	Yes	2	Number	1=fish sampling 2=other aquatic or terrestrial species 3=insect sampling 4=riparian vegetation 5=physical instream habitat 6=water quality/quantity 9=other
Method	Primary methods used for monitoring activity	No	NA	Memo	
Control	Does monitoring include a control stream or watershed	Yes	1	Logical	
DataAvail	Is monitoring data available?	Yes	1	Logical	
Comments		No	NA	Memo	

12. Monitoring Data Table - One to Many Relationship with Monitoring Table via ProjID and MonitoringID

Smallest Spatial Resolution: Project
Largest Spatial Resolution: Project
Time Span for Reporting: Annual

Field Name	Field Description	Req	Max Width	Type	Codes/ Conventions
ProjID	StreamNet Primary key for the projects database that uniquely identifies a project	Yes	7	Long Integer	Number ranges will be assigned by agency
MonitoringID	Classification for general monitoring type	Yes	2	Number	See Above
DataTypeID	Code for more detailed data type collected	Yes	3	Number	1=Fish counts 2=Insect counts 3=Water temp 4=Air temp 5=Soils 6=Salinity etc, etc.

Control	Does monitoring include a control stream or watershed	Yes	1	Logical	
Comments		No	NA	Memo	