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**Klickitat
Management, Data and Habitat**

Project # 1988-120-35

Contract # 33656

Final Report

May 1, 2007 – April 30, 2008

The Confederated Tribes and Bands of

The Yakama Nation

Prepared For:

BPA

**Bonneville Power Administration
Portland, Oregon**

Submitted on behalf of all Project Personnel

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INTRODUCTION

The Yakima/Klickitat Fisheries Project (YKFP or Project) continues to be an all stock initiative that is responding to the need for scientific and applied knowledge for rebuilding and maintaining naturally spawning anadromous fish stocks in both subbasins. As the Lead Agency, The Yakama Nation, in coordination with the co-managers, Washington Department of Fish and Wildlife, and in cooperation with the Bonneville Power Administration, the funding agency, is pursuing this goal. We are testing the principles of supplementation and integrated hatchery management as a means to rebuild fish populations through the use of locally adapted broodstock in an artificial production program. Also, the goal is to increase the numbers of naturally spawning fish, while maintaining the long term genetic fitness of the fish population being supplemented.

In the Klickitat subbasin, the YKFP will incorporate positive findings from Yakima subbasin supplementation activities to increase populations of spring Chinook and steelhead for natural production and harvest augmentation. The coho and fall Chinook production programs will continue for the near term to import hatchery eggs (fall Chinook) and hatchery pre-smolts (coho) for rearing and release from acclimation ponds in the basin. The status of these activities is described in the YKFP Monitoring and Evaluation contract (Project # 1995-063-35). The Klickitat artificial production effort will be presented in the updated Klickitat River Fisheries Master Plan, which identifies phased production goals, facility requirements, and habitat strategies. The proposed changes in production goals will be identified through updating of species-specific Hatchery Genetics Management Plans (HGMP). Project activities in the Klickitat Basin include:

1. Research of fish populations (i.e. status, geographic distribution, habitat relationships);
2. Inventory of fish habitat;
3. Development of management alternatives for all integrated hatchery and production stocks; and
4. Coordination of preliminary design, permitting, and cost projection of infrastructure upgrades and new construction associated with proposed Master Plan actions.

This report is formulated in the format of the contract and PISCES Statement of Work. **Attachment A-** Legal/Policy Analysis Summary report (Patrick Spurgin) during period of May 1, 2007 through April 30, 2008; **Attachment B-** Activities of Harbor Consulting Engineers, Inc. for Yakama Nation during period of May 1, 2007 through April 30, 2008; **Attachment C-** Klickitat Information System Management Plan; **Attachment D-** YKFP-Klickitat Updated Organizational Charts; **Attachment E-** Financial and Capital Inventory Reports.

The **Management, Data and Habitat** contract supports the Yakama Nation's (YN) role as the YKFP's Lead Agency. As Lead Agency, the YN is directly responsible for managing and/or implementing all Project activities, including those related to policy formulation, planning and design; the construction, operation and maintenance of YKFP facilities; and the monitoring and evaluation of Project research activities. The Lead

Agency is also responsible to ensure adequate funding for all Project activities. Specifically, the contract covers the YN's management and oversight of the following YKFP activities:

1. YN/YKFP Project Management and Implementation;
 2. YN/YKFP Policy Coordination and Analysis;
 3. Klickitat Habitat, Water and Passage Project Coordination
 4. Maintain Yakama Nation YKFP Klickitat Information System Management Planning;
 5. YN/YKFP Data and Information Management;
 6. YN/YKFP Klickitat Data Acquisition;
 7. YN/YKFP Klickitat Data and Information Dissemination;
 8. Klickitat Master Plan Revision;
 9. YN/YKFP Project Annual Review;
 10. Klickitat Master Plan NEPA & Preliminary Design;
 11. YN/YKFP Klickitat Subbasin Project Outreach and Education;
 12. Produce Environmental Compliance Documentation;
 13. Project Status Report;
 14. Project Annual Report.
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Objective #	Work Element Title
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WORK CATEGORY: PLANNING AND COORDINATION

OBJECTIVE

A 165. Produce Environmental Compliance Documentation: Participate in ESA/NEPA Compliance for Klickitat Basin M&E and Fisheries Management

PURPOSE

Prepare documentation in support of Endangered Species Act (ESA) & National Environmental Policy Act (/NEPA) compliance regarding fisheries monitoring and evaluation activities in consultation and coordination with BPA environmental staff. This work element acknowledges that all activities regarding ESA/NEPA compliance will be coordinated with BPA environmental staff to ensure that adequate compliance is in place prior to actions occurring.

ACCOMPLISHMENTS

YKFP staff presented the BPA COTR with all necessary ESA/NEPA compliance documentation for the Klickitat Monitoring & Evaluation Project (#1995-063-35). These documents include a Section 4d permit issued by NOAA to the USFWS to collect fish samples for the ongoing pathogen study. A second Section 4d permit was issued by NOAA to WDFW for operation of the existing adult trap at the Lyle Falls Fishway under

BPA # 2003306500. There are no specific ESA/NEPA updates required for this project. However, the Project staff has recently assisted BPA in preparation for comprehensive NEPA coverage for the Klickitat Monitoring & Evaluation Project (#1995-063-35), the EIS Scoping for the proposed Lyle Falls Fishway reconstruction work, and categorical exclusion for development of the Castile Falls Adult Enumeration Facility. The YN has requested funding from BPA to modify the existing Lyle Falls Fishway, owned by the Washington Department of Fish and Wildlife (WDFW) and operated by the YN, to improve upstream migration for fish to the upper watershed, especially during low flows. A draft Environmental Impact Statement (EIS) for the Lyle Falls Fishway construction work was issued in March 2008. YKFP staff supported BPA at a public meeting in Lyle, WA regarding the draft EIS on April 16, 2008, and assisted BPA with reviewing and responding to public comments.

OBJECTIVE

B 189. Regional Coordination: and Analysis

YN/ YKFP Klickitat Policy Coordination

PURPOSE

Coordination of YKFP management and policy development with other government agencies and decision-making bodies, including implementation of lead agency responsibilities and cooperative planning and policy development with Washington Department of Fish & Wildlife (WDFW), BPA, NPCC, National Oceanic and Atmospheric Administration (NOAA) Fisheries, Columbia Basin Fish & Wildlife Authority (CBFWA), and other federal, state and local government agencies, as well as coordination of lead agency activities with appropriate Tribal officials and personnel when necessary.

TASKS

a.) Review database systems	Meet w/BPA & NPCC to review compatibility with existing BPA & NPCC data management systems and ongoing needs of YKFP
b.) Provide immediate oversight of all scientific aspects of the YKFP	Review ongoing research and planning and prioritize future YKFP research using adaptive management
c.) YKFP Management & Policy Development	Coordinate appropriate tribal officials and personnel with WDFW, BPA, NPCC, NOAA Fisheries and other federal, state and local government agencies and decision-making bodies
d.) Lead Agency responsibilities	Implement lead agency responsibilities and cooperative planning and policy development with above list of agencies

<p>e.) Coordinate development of a Klickitat Subbasin-based Scientific & Technical Advisory Committee (STAC), responsible for immediate oversight of all scientific aspects of the YKFP, and that will utilize adaptive management to prioritize the critical uncertainties that the YKFP addressed in its research projects.</p>	<p>Develop Klickitat-based STAC for review ongoing and future YKFP research.</p>
<p>f.) Coordinate and conduct routine Klickitat Subbasin monthly staff meetings</p>	<p>Review ongoing research and planning and prioritize upcoming YKFP efforts.</p>
<p>g.) Formulate and implement appropriate YKFP Monitoring Implementation Planning Teams</p>	<p>Develop Monitoring Implementation Planning Team (MIPT) for YKFP in the Klickitat Subbasin.</p>

ACCOMPLISHMENTS

During this annual review period, Project staff attended meetings and kept up-to-date via document review and emails of both the Collaborative Systemwide Monitoring and Evaluation Project (CSMEP) and Pacific Northwest Aquatic Monitoring Partnership (PNAMP) to ensure consistency of YKFP collected data with regional efforts. Through monthly meetings Project staff informed the YKFP Policy Group and members of STAC of Klickitat specific R, M&E actions. In order to relay pertinent information to the YKFP Policy, routine staff meetings were held at the Klickitat Field Office in Wahkiacus, WA. Internal YKFP monitoring teams were developed on an as-needed specific task basis, primarily with the Klickitat Basin Lead Research Scientist, Klickitat M&E Lead Biologist and Klickitat Habitat Specialist.

OBJECTIVE

C 114. Identify and Select Projects: Klickitat Habitat, Water and Passage Coordination

PURPOSE

Coordinate with federal, state and local government and non-governmental organizations with respect to anadromous fish, stream flows and related matters to promote fish and riparian habitat and stream flow (passage) protection and restoration; monitor recovery.

TASKS

<p>a.) Seek funding and develop projects for habitat, passage and instream flow restoration and protection within the Klickitat subbasin</p>	<p>Actively seek funding for these projects.</p>
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ACCOMPLISHMENTS

During this annual review period, efforts focused on several processes: the BPA and NPCC Master Planning Process and BPA/YN Fish Accord process were the primary actions. In addition the YN focused on the Salmon Recovery Board Funding Project, U.S. Fish & Wildlife Partnership Process, NOAA Community Salmon Fund/Community-Based Habitat Restoration, BIA Watershed Restoration funding, National Fish and Wildlife Foundation, EPA Targeted Watershed Grant solicitation, and NOAA Pacific Coastal Salmon Recovery (PCSRF) process. Prioritized habitat actions were identified within the Klickitat Subbasin NOAA Salmon Recovery Plan for Middle Columbia Steelhead (threatened). The NOAA Recovery Plan which is scheduled to go to the Federal Register in September 2008, is intended to identify a suite of habitat restoration actions within the Klickitat Subbasin that will lead directly to recovery and de-listing of this threatened stock. It is assumed that future federal dollars for recovery will be tied specifically to this document. Now proposals will be developed consistent with the NOAA Recovery Plan and with the NPCC Subbasin Plan for Klickitat Mid-Columbia steelhead. Future projects identified in the NOAA Salmon Recovery process were a further development of subbasin planning. . Projects identified in the NOAA recovery plan await formal adoption of the plan by NOAA. Several NOAA PCSRF projects have received high marks through the initial ranking process and have a high degree of likelihood of being funded.

TASKS

<p>a.) Attend SB2514 Watershed Planning meetings for WRIA 30</p>	<p>Track WRIA 30 Watershed Planning process through meeting attendance and document review. Provide comment and recommend coordination of project implementation and program elements with YKFP goals</p>
<p>b.) Attend SB2496 Salmon Recovery Planning Citizen’s Review Committee meetings that address WRIA 30</p>	<p>Review SB2496 Salmon Recovery Planning Citizen’s Review Committee documents and provide comment, and coordinate implementation of projects and program elements with YKFP goals</p>
<p>c.) Review and comment on Klickitat County permitting and planning activities that affect YKFP goals</p>	<p>Provide comments, coordinate plan development, and identify strategies for plan implementation consistent with YKFP goals; for example, Critical Areas Ordinance reviews, Shoreline Management Act permits, and development proposals</p>
<p>d.) Coordinate permitting for existing and future Pacific Coastal Salmon Recovery Fund projects and Salmon Recovery Funding Board projects</p>	<p>Assist in development of tribal, Federal, state, and county permits of PCSRF & SRFB-funded projects in the Klickitat Subbasin</p>
<p>e.) Attend NOAA Recovery Planning- Middle Columbia</p>	<p>Track regional effort and direct YKFP - NOAA Recovery Planning efforts specific to the</p>

ESU meetings	Klickitat Subbasin in the Middle Columbia ESU
f.) Pursue funding for NOAA Salmon Recovery Planning dollars	Develop Klickitat Subbasin proposals specific to NOAA Regional Recovery Strategy
g.) Track NPCC's Subbasin Planning process specific to Klickitat Subbasin	Ensure consistency with YKFP goals for the Klickitat Basin
h.) Perform technical writing services	Assist in the development, annual revision, and long-term maintenance of the many Project documents

Note:

Some technical habitat, water and passage matters arising within the Klickitat Subbasin will be managed by the YKFP-Klickitat Habitat Restoration Specialist/Hydrologist, who is covered by the YKFP's Klickitat Watershed Enhancement Project (Project # 1997-056-00) contract. Specific tasks are identified in that separate contract.

ACCOMPLISHMENTS

Task a.): Attend SB2514 Watershed Planning meetings for WRIA 30

Klickitat County is acting as lead for this Washington State Department of Ecology effort. To date, Klickitat County has completed the following documents which are presented at the web site listed below. YKFP will continue to track this process to address fisheries-related issues.

Klickitat County WRIA 30 web site [here](#).

SEPA Determination of Significance:

[SEPA-1 WIRA30 SEPA_DS.pdf](#)

SEPA Addendum:

[SEPA-2 Addendum WIRA30.pdf](#)

Evaluation of the Adequacy of the Final Environmental Impact Statement:

[SEPA-3 WRIA_30_State_EIS_Adequacy_Eval_3-27-2006.pdf](#)

Klickitat River Basin (WRIA 30) Watershed Management Plan

WRIA 30 PHASE II WATERSHED ASSESSMENT

APPENDIX A - LEVEL I WATERSHED ASSESSMENT

APPENDIX B - MULTIPURPOSE WATER STORAGE SCREENING ASSESSMENT REPORT

APPENDIX C - ADDENDUM TO MULTIPURPOSE WATER STORAGE SCREENING ASSESSMENT

APPENDIX D - WRIA 30 PHASE II WATERSHED ASSESSMENT NITRATE CONCENTRATIONS AND DISTRIBUTION STUDY

APPENDIX E - WRIA 30 SWALE CREEK WATER TEMPERATURE STUDY

APPENDIX E (part 2) - ADDENDUM A: TEMPERATURE PLOTS FOR INDIVIDUAL YEARS COLLECTED AT EACH MONITORING SITE BY THE CENTRAL KLICKITAT CONSERVATION DISTRICT AND THE YAKAMA NATION

Task b.): Attend SB2496 Salmon Recovery Planning Citizen’s Review Committee meetings that address WRIA 30

SB2496 meetings were tracked by YKFP Personnel. The YKFP M&E Lead biologist continues to serve as the Chairman of the Klickitat Technical Advisory Group (KTAG). As the KTAG functions as the technical advisory role to the Citizen Review Committee (CRC), he routinely assists at these meetings. At this point, the primary focus of the CRC is to review 8th Round Salmon Recovery project applications for adherence to local goals and Strategic Plan development for both WRIA 30 (Klickitat River Watershed) and WRIA 29 (White Salmon River Watershed).

Task c.): Review and comment on Klickitat County permitting and planning activities that affect YKFP goals

Klickitat County public notices were reviewed regarding land use applications adjacent to stream corridors. On several occasions the County Planning Department was contacted for future information. On several occasions, the department was visited for more information. During this review period ongoing discussions are occurring with two potential shoreline violations in the lower Klickitat Subbasin

Task d.): Coordinate permitting for existing and future Pacific Coastal Salmon Recovery Fund (PCSRF) projects and Salmon Recovery Funding Board (SRFB) projects

Four projects were reviewed for PCSRF (2) and SRFB (2). A high level of participation occurred for both processes, including design and permitting assistance for each project.

Task e.): Attend NOAA Recovery Planning - Middle Columbia ESU meetings

During this review period, project staff tracked both the Klickitat Salmon Recovery Plan development and the Middle Columbia roll-up. The “Roll-up” document identifies strategy across the Middle Columbia distinct population segment (DPS). Project staff pointed out to NOAA planners the hatchery reform measures identified within the revised Klickitat Master Plan and demonstrated their consistency with steelhead recovery.

Task f.): Pursue funding for NOAA Salmon Recovery Planning dollars

To participate at the appropriate level, project staff worked with the Yakama Nation Fisheries Program and NOAA personnel to accurately identify staff needs and timelines

for this important effort. NOAA and YNFP are finalized a NOAA budget and associated billable tasks by the YN.

Task g.): Track NPCC’s Subbasin Planning process specific to Klickitat Subbasin

As throughout the majority of the Columbia Basin, the NPCC subbasin planning process has informed and expanded into the Salmon Recovery process. During this review period, YKFP staff has engaged Klickitat County Natural Resources Division staff to begin discussions for the development of a regional recovery board or sub-board. As discussions continue, the YKFP goal will be to use existing resource plans such as the NPCC Klickitat Subbasin Plan, NOAA Salmon Recovery Plan and Klickitat Lead Entity Strategic Plan to continue a prioritized approach to habitat preservation and restoration. The YKFP continues to track NPCC budgeting and planning activities specific to Subbasin Plan updates. As of the writing of the report it appears unlikely that Klickitat County will participate in the establishment of a Regional Recovery Board. Per State Salmon Recovery Board guidance a county participation is required in formation of a Board.

Task h.): Perform technical writing services

Technical writing was performed through several of the previously mentioned processes, including SB 2496 Salmon Recovery, NOAA Salmon Recovery/BiOp Remand, NPCC salmon recovery efforts and PCSRF funding.

WORK CATEGORY: RM&E AND DATA MANAGEMENT

OBJECTIVE

D 174. Produce Plan: Maintain Yakama Nation YKFP Klickitat Information System Management Planning

PURPOSE

Maintain an up-to-date Information System Management Plan (ISMP) by identifying the YKFP’s near- and long-term data and information management needs within the Klickitat basin. Develop methods to standardize, consolidate and centralize all pertinent data and information that is generated within the basin. Design an information management and transmission system (hardware and software) capable of handling existing and future generated data, providing for quality control, standardization, and proper storage procedures. Identify mechanisms whereby various end users may be identified and provided adequate access to appropriate data and/or information. Periodic modifications in the ISMP will reflect changes in project scope and developments in data design. Management strategies may evolve based on recommendations and feedback received from peer review and/or infrastructure demands.

TASKS

<p>a.) Research the technical and personnel requirements for the development of an Arc Spatial Data engine (SDE).</p>	<p>Geographic location of our sampling activities is the one attribute that can tie all our data together. The growth of our geographic data sets and multi-user demands necessitate centralized storage and management of this large body of data. Development of an ArcSDE geo-</p>
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	database will facilitate sharing of the data among staff and other entities and reduce management resource requirements. Time spent on this milestone will assess and document the resource requirements involved in transitioning from current data formats to ArcSDE. If the SDE progresses into the planning and development phase, this will become its own work Element.
b.) Review/revise and maintain Plan	Review the ISMP. Revise plan to accurately reflect progress made in the preceding year
c.) Distribute Plan to YKFP staff	Distribute Plan to YKFP Data Management Team and KFO staff for review and comment
d.) Klickitat Information System Management Plan (ISMP) meetings	Periodically meet with YKFP Data Management Team and regional data managers. Prioritize plan and distribute work responsibilities.
e.) Maintain Plan	Periodically update the plan to reflect progress made and incorporate evolving data management needs

Additional notes:

The ISMP cannot, by nature, be a static document. It provides a snapshot of the state of the body of YKFP data collected in the Klickitat Basin at a certain point in time, along with short- and long-term strategies for managing that body of data. Interaction with all the data will be ongoing. The plan will evolve as progress is made. Different aspects of the data will take the focus at different points in time.

ACCOMPLISHMENTS

Task a.): Research the technical and personnel requirements for the Development of an Arc Spatial Data Engine (SDE)

Geographic location of our sampling activities is the one attribute that can tie all our data together. The growth of our geographic data sets and multi-user demands necessitate centralized storage and management of this large body of data. Development of an ESRI Arc Spatial Data Engine (ArcSDE) geodatabase will facilitate sharing of the data among staff and other entities and reduce management/administration resource requirements. Time will be spent on this milestone to assess and document the resource requirements involved in transitioning from current data formats. A prototype Spatial Data Engine was created with some promising results. We continue to assess networking structures to support multi-user access to this system. The Data Systems Specialist (GIS) is working with the assistance of the KDSM to implement a centralized geodatabase using ArcSDE software backed by a MS sqlServer. During this reporting period, the Data Specialist added data, added one user, and updated system documentation for the Spatial Database

Engine (SDE) shared GIS database system. Geographic data added included black and white orthophotos for the Klickitat drainage, scanned USGS quads for the Klickitat and Rock Creek areas, and the 2006 NAIP color photography for Klickitat and Skamania counties. More 10-meter digital elevation data was added to the west edge of the previous DEM set so it extends through the Little White Salmon drainage from WRIA 31. We identified and corrected a problem that created a large log file that was filling up a storage system. The Data Specialist started a data catalog of the contents of the system. Some ongoing stability problems in the hardware and/or software have, at times, limited the usefulness and availability of the SDE. The Data Systems Specialist (GIS) and the KDSM are working to secure the long term stability of the SDE.

Task b.): Review/revise Plan & maintain Plan

The YKFP Klickitat Data Systems Manager (KDSM) maintains an up-to-date Information System Management Plan (ISMP). The ISMP is presented as Attachment C. The YKFP's near- and long-term data and information management needs within the Klickitat Basin are regularly assessed. The plan was reviewed on a bi-monthly basis by the KDSM in consultation with staff biologists who are intimately involved with those portions of the plan within their individual scopes of work.

The goal is that of standardizing, consolidating and centralizing all data and information that is generated within the basin. Ideally, relational databases are developed with input, validation and editing forms along with informational reports summarizing the data. One of the advantages of relational databases is that once the data is stored in a normalized state, it can be relatively easily manipulated through queries to satisfy most any formatting requirements. A second advantage of normalized data is the ability to store unique entities in one place providing a key to multiple related entities. This provides the ability to edit this entity in one place and have it reflect anywhere it is used. This is extremely useful when quality checks reveal errors that must be corrected.

The utility of developing detailed metadata describing our data sets is working its way to the forefront and has been added to the data management plan for two important reasons:

1. Detailed metadata written to a national or international standard allows that metadata to be placed in a searchable index, thus making it available to researchers who could make use of the data if they knew it existed.
2. Detailed metadata preserves knowledge of how the data was collected and stored. This helps to conserve the data's value in the absence of those who collected and stored it.

Data management tasks are addressed based on priority given them by staff biologists and an assessment of the feasibility of developing workable solutions. Available time and resources dictate that the more complex data sets are tackled one at a time. Generally, those data sets that easily lend themselves to relational models, like stream temperature and sediment, are in more advanced stages of database development. Given the time demands of developing relational databases, data sets with more complex relationships

like spawning surveys are stored and evaluated within spreadsheets that are a workable solution while we continue to evaluate strategies for developing relational data models. Some very complicated data sets (i.e. TFW, Screw Trap and Scale Age) have been modeled into working databases, the functionality of which continues to progress. The Klickitat ISMP is evolving as higher priority tasks are completed and new needs are recognized.

Task c.): Distribute Plan to YKFP staff/ Klickitat ISMP Meetings

Drafts of the ISMP regularly circulate among the staff. Formal ISMP meetings as well as impromptu conversations and collaborations have been held to prioritize planned work and distribute work responsibilities. Planning is further refined and focused as the actual work of modeling, inputting and analyzing data is carried out. Many unforeseen relationships are identified as others are refined throughout the process.

Task d.): Maintain Plan

The design of the information management and transmission system (hardware and software) capable of handling existing and future generated data is an ongoing process. We are building a system that will provide for quality control, standardization, and proper storage procedures. Modifications in the ISMP will reflect changes in project scope, priorities, and developments in data design. Management strategies may evolve based on recommendations and feedback received from peer review and/or infrastructure demands.

OBJECTIVE

E 160. Create/Manage/Maintain Database: YN/YKFP Data and Information Management

PURPOSE

The ISMP is implemented by monitoring the data collection systems of the YKFP; supervising the input of all data into a standardized system and coordinating any necessary reformatting of existing data; verifying that proper data validation procedures are followed and assuring that appropriate hardware and software are used to provide timely data and/or information accessibility to appropriate researchers.

TASKS

a.) Data modeling	Design and/or refine relational models for the storage of existing and newly generated data
b.) Design/build/modify forms	Design/build and /or modify standardized data input and editing forms. These forms are to be used for quality assurance as well as data entry.
c.) Design/build/modify reports	Design/build and /or modify standardized reports of summary data and statistics. In any case where the same summary data and statistics can be used to analyze the same phenomena over different time spans, standardized reports should be developed and used.
d.) Custom queries	In cases of unique data requests or where no standardized report criteria have been specified, customized queries and

	data manipulations may be performed to compile and format the data and/or information requested.
e.) Technical support and maintenance	Provide administrative and technical support on all YN/ YKFP IT equipment within the Klickitat Basin Research new hardware and software acquisitions and oversee their implementations.

Additional notes: Data and information management involves ongoing network/database administration and technical support provided along with application design and development.

ACCOMPLISHMENTS

The ISMP is implemented by monitoring the data collection systems of the YKFP, supervising the input of all data into a standardized system and coordinating any necessary reformatting of existing data, verifying that proper data validation procedures are followed and assuring that appropriate hardware and software are used to provide timely data and/or information accessibility to appropriate researchers.

Task a.): Data modeling

In the 2007 - 2008 project year the relational models were modified for the Scale Age, TFW and Lyle Adult Trap databases and preliminary work began on a relational model for spawning survey data. In all cases modifications of the models involved additional fields being added to existing tables. The preliminary modeling for the Spawning Survey database involved the identification and description of standardized points on the river where surveys may start or end and working out complexities on how these locations can be used in summarizing data.

Task b.): Design/build/modify forms

Forms for data entry, data validation and data editing are generally required for populating databases, verifying the accuracy of the data and correcting any errors detected. While these tasks can be performed through the use of customized queries, such an advanced use of Structured Query Language (SQL) is well beyond the skill sets and/or time restraints of most biologists and fisheries technicians. Data manipulation forms allow the technicians and biologists with the most intimate knowledge of the data and its collection to submit, validate and edit the data.

This year modifications were made to data input, validation and editing forms for the Scale Age, Lyle Adult Trap and TFW databases. Some of these modifications were implemented as work flow improvements that were identified through interaction with the forms. Other modifications were made to accommodate changes to the underlying database tables. Forms are modified and redistributed to the users. This is an open cycle that allows continual improvement. These modifications do require the expenditure of valuable development time. We make every effort to anticipate and plan for user and data storage needs at original design but the tests of actual production often reveal valuable improvements that can be made to these systems.

We had some success this year with scale age database forms connected via ODBC to a remote database stored on our web server. These forms allow users from multiple locations to interact with this database. This interface has proven to be bandwidth sensitive. The latency of satellite uplinks has proven to be a hindrance to this approach. We are investigating options for increasing bandwidth, decreasing latency, or developing a “thin client” interface that has less bandwidth demand.

Satellite latency has also interfered with a prototype web interface that was tested to allow Klickitat Hatchery personnel to update a remote table of adult returns on a daily basis so this information can be shared with the public on a web page. Testing on this form revealed that the Internet connection at the Klickitat Hatchery does not maintain consistent bandwidth to support the transactions. It is expected that a larger antenna will solve this problem. In the interim, the updates are transmitted via e-mail to YKFP data management who, in turn, update the web page.

Task c.): Design/build/modify reports

Standardized reports allow information summarizing the data and statistical results to be presented in a meaningful way, and can streamline annual reporting requirements. In this contract year, development continued on web-enabled reports for the Lyle Adult Trap and Hatchery Adult recruitment data. In each case the goal is that a real time graphic representation of actual fish counts be presented on the YKFP.org/Klickitat web site. Bandwidth and latency constraints imposed by our satellite uplinks and internet service providers have curtailed our ability to present real time data on the web. Formats have been developed to present this information. The manual manipulation of data and files that must occur between data entry to the point of presentation involves much more time and labor than would be necessary if these processes could be reliably automated. The KDSM is presently investigating avenues of overcoming connectivity issues imposed mainly by our remote facility locations. The options presently under consideration are increased bandwidth, reduced latency and the development of thin client web applications.

Extended versions of the summary reports for the Water Quality database, Sediment database and Thermograph database were created for presentation on the web. These reports summarize our entire body of data for each data set, whereas those featured in our annual report summarize the data for a given year. The intent here will be to update the web reports annually along with the generation of the annual reports. Development is underway to create the same type presentations for our TFW data.

Task d.): Custom Queries

In cases of unique data requests or where no standardized report criteria have been specified, customized queries and data manipulations may be performed to summarize, compile and format the data and/or information requested. Custom queries are used extensively in fulfilling the data and information needs of YKFP staff as well as for the dissemination of YKFP-generated data and information to entities external to the YKFP. We also make some use of custom queries in acquiring external data such as release information from the Regional Mark Information System (RMIS), PTAGIS and other

sources. All information retrieval from the Screw Trap, Scale, Coded Wire Tag, DNA, and Projects databases is accomplished through custom queries, as these datasets are in early states of development. Standardized reports require an investment of resources most economically applied to data structures that are normalized and expected to remain relatively static. As we finalize our data structures for these data sets, the development of reports will follow.

In addition to the above mentioned work, some custom manipulation was required this year to correct errors detected through data validation procedures being performed on the TFW database. Custom queries are also utilized in compiling PIT-tagging files prior to submission to PTAGIS.

Task e.): Technical Support and Maintenance

The KDSM provides sole administrative and technical support on all Yakama Nation/ YKFP IT equipment and staff within the Klickitat basin. Of all the hats the KDSM wears, the support of the information management and transmission system (hardware and software) utilized by the staff and scientists of the YKFP is by far the most demanding of time and resources. The system we have in place works well most of the time as the result of careful configuration and regular maintenance. The continuing education required to provide effective support is a considerable but necessary time demand. KDSM provided on-demand technical support for two servers, eight desktop work stations, and seven laptops, multiple peripheral devices including networked and stand-alone printers of various sizes. The KDSM performs and/or arranges the maintenance and repair of the network infrastructure that allows all these machines to work together including two satellite uplinks through which we maintain reasonable connectivity to the internet for data acquisition and distribution activities.

Maintaining a web presence has introduced new technical support and maintenance requirements. Broken links must be tracked down and repaired. All of our data presentations require manual updates be performed as often as is practical. All improvements and additions require some time spent in testing,

Field technical support was provided for PIT-tagging activities as well as for monitoring the release of PIT-tagged fish from Hatchery ponds.

Research and evaluation of alternative internet connectivity solutions has consumed some data management time this year, as has the investigation into the resource requirements of developing custom web applications that require less bandwidth for interacting with data stored on remote servers.

OBJECTIVE

F 159. Transfer/Consolidate Regionally Standardized Data: YN/ YKFP Klickitat Data Acquisition

PURPOSE

The KDSM is tasked with acquiring appropriate Klickitat basin data from collection activities performed by the YKFP and other relevant entities, and ensuring quality

control, standardization, and proper storage procedures for all data and information acquired.

TASKS

a.) Identify entities with which YKFP Data Management should interact for the purpose of acquiring data	Consult with YKFP staff and other pertinent individuals and/or organizations to identify entities with which YKFP Klickitat Data Management should interact for the purpose of acquiring data. Create a contact list of these entities and their relevant information
b.) Establish a schedule for data acquisition activities	Create a schedule of data acquisition activities that will be performed over the remainder of the contract year
c.) Perform and monitor data acquisition activities	Perform data acquisition activities as scheduled and/or as they arise. Modify the schedule of activities and contact list to address evolving data acquisition needs

Additional Notes: On-going, continuing task for project.

ACCOMPLISHMENTS

Task a.): Identify entities with which KDSM should interact for the purpose of acquiring data; **Task b.): Establish a schedule for data acquisition activities**

Data acquisition is an ongoing activity for the KDSM. When a need for external data is identified, the KDSM works with staff biologists and technicians to identify sources of such data, and assists in arranging its timely acquisition. We acquire certain data, like stream flows, from the same agencies (i.e. USGS) on a regular basis. More often data acquisition needs arise unexpectedly and on a “one-off” basis. The YKFP would recommend a change to these milestones to reflect this almost continuous activity.

Task a.) “Identify entities with which KDSM should interact for the purpose of acquiring data” should remain the same, but Task b.) “Establish a schedule for data acquisition activities” should be revised to reflect the continuous timeline and be rewritten to read “Coordinate the scheduling and implement data acquisition activities”.

Task c.): Perform and monitor data acquisition activities

The vast majority of the data acquired by the YKFP is generated from within the RM&E program. This program produces a considerable amount of data on a daily basis. This data is stored in relational physical data models where possible, while in some cases spreadsheets are utilized, as they are the most appropriate means available. Data are stored centrally or in the custody of the particular biologists at the respective biologist’s discretion. The KDSM consults with the project biologists on storage and validation techniques and strategies. Data validation is done as immediately after the collection of the data as possible. On smaller data sets, the biologist will validate the data upon submission. On larger sets, one or many people share the task of walking through the records one at a time to check the accuracy. Some validation is accomplished through input masks and custom queries. Data input and validation is secondary in the job of field technicians to the collection of data. The addition of a technical position devoted to input

and validation of data may be a useful investment. Another possible improvement may be to automate data entry in the field with handheld data loggers. This would eliminate the need to manually transfer data from paper to electronic media, but also eliminates a hard copy of the data, which is a physical backup. Neither of these solutions can be implemented under current budget constraints.

The Klickitat Watershed Enhancement Project Technician received in-house training on and has taken an active role in the input and validation of TFW habitat survey data and sediment data. He has also taken over responsibility for field acquisition of Thermograph data and was involved in the data input of this year's stream temperature data. It is anticipated that the KWEP Technician will receive training on the validation of thermograph data and eventually take over that role as well. Data validation is an ongoing process.

The Klickitat Hatchery near Glenwood was transitioned to YKFP operation in May of 2006. Hatchery data management has been transferred to the YN under the YKFP. The YN Hatchery Manager (HM) is assisting Klickitat Data Management (Work Element E) in compiling, synthesizing and presenting hatchery data within YKFP formats. Data produced by the Klickitat Hatchery is vital to the implementation of the Klickitat Subbasin Anadromous Fisheries Master Plan. The KDSM worked with the HM in planning and installing hardware and software, and providing network connectivity needed to support the hatchery's data collection and storage needs. Since the hatchery transition took place, the groundwork has been laid to begin work on compilation, synthesis and presentation of hatchery data within YKFP formats. This will be modeled on the forms and reports used at the Cle Elum Supplementation & Research Facility, but a unique, relational data model is expected to be developed for the Klickitat Hatchery.

The YKFP within the Klickitat subbasin utilizes flow data acquired from the USGS, Washington State Department of Ecology and Tribal Water Resources. Some Bonneville Dam out-migrant data is acquired through PTAGIS. Individual YKFP biologists within the Klickitat basin acquire data independently of the KDSM. The KDSM is available for consultation and support as requested. Establishing a fixed schedule for data acquisition activities has not been successful, as data acquisition needs tend to be filled as they arise. The KDSM performs and monitors data acquisition activities as needed.

OBJECTIVE

G 161. Disseminate Raw & Summary Data and Results: YN/YKFP Klickitat Data and Information Dissemination

PURPOSE

Identify the appropriate data and/or information to be shared with various entities. For a given entity, make data available at a usable resolution through appropriate media. This could include electronic file transfers for specific data requests or web pages to disseminate more general information and/or data.

TASKS

a.) Identify entities with which YKFP KDSM should	Consult with YKFP staff and other pertinent individuals and/or organizations to identify entities
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interact for the purpose of disseminating data	with which YKFP KDSM should interact for the purpose of disseminating data. Create a contact list of these entities and their relevant information
b.) Establish a schedule for data dissemination activities	Create a schedule of data dissemination activities that will be performed over the remainder of the contract year
c.) Identify desired web content and format	YKFP Klickitat-based staff will identify and define what data and/or information they wish to publish for general public consumption over the internet
d.) Web site design	As part of the ISMP (Work Element D), carry out planning and design activities to add Klickitat data and information to the YKFP web site
e.) Perform and monitor data dissemination activities	Perform data dissemination activities as scheduled and/or as they arise. Modify the schedule of activities and contact list to address evolving requirements
f.) Post Pages	As informational pages are developed and approved, post them to the YKFP.org web site.
g.) Develop Metadata	Develop robust metadata for all YKFP Klickitat data sets to the FGDC standard
h.) Automate Publication of Metadata	Set up an electronic location where YKFP Klickitat metadata may be harvested for publication on a searchable portal.

Additional Notes: Site-specific or subsets of project information is/are disseminated from the Klickitat Field Office on a case-by-case basis when authorized by the manager of this project.

ACCOMPLISHMENTS

Task a.): Identify entities with which YKFP Klickitat Data Management should interact for the purpose of disseminating data; Task G161.b: Establish a schedule for data dissemination activities; Task G161.e: Perform and monitor data dissemination activities

Our data storage has evolved to a state that allows some information to be disseminated near real time over the internet. Other summary data will be presented on the web in static graphs and tables to be updated annually along with the prospective project annual reports.

YKFP Klickitat Data Management disseminates data predominantly for YKFP use and, upon request to other agencies, with the input and consent of YKFP biologists and staff.

We have regularly provided WDFW with spring and fall Chinook spawning data which is used in run reconstruction and future run predictions. During the 2006-2007 project year responsibility for spring Chinook run reconstruction and future run predictions was shifted to the YKFP data management team while responsibility for fall Chinook estimates remains with WDFW. This changed, somewhat, the content and direction of the data exchanges. WDFW provides the YKFP with sport harvest information on spring Chinook, while the YKFP provides the WDFW with spawning survey, scale age, and

Lyle adult trap data on the fall Chinook. Cooperation between the two entities continues to work smoothly.

YKFP Klickitat data is disseminated as requests are received and authorized by YKFP Management. As with data acquisition, the data dissemination scheduling milestone in PISCES should be changed to a continuous timeline and rewritten to read “Coordinate the scheduling and implement data dissemination activities”.

Task c.): Identify desired web content and format; Task d.): Web site design; Task f.): Post pages

YKFP Klickitat-based staff have identified and defined much of the data and/or information we wish to publish over the public internet. Traditionally, YKFP data has been organized around annual reports with individual tables and graphs analyzing and describing each year’s activities. This approach does not lend itself well to multi-year presentations, as would be most informative and appropriate on the web. As we have designed relational data models for much of our historic data and developed standardized annual reports for these data sets, we can modify these reports and publish summaries of our body of data in each of our data collection areas. Each year, as new data are added and validated, we can re-run the reports to update the older reports. We are making steady progress toward this goal. It is the consensus of the YKFP Klickitat scientists and staff that KDSM time is better spent reorganizing the data sets to provide accurate and useful presentations before rushing them to the web. All this work is performed around the technical support needs of a substantial information management and transmission system.

As the annual data reports are created to support the RM&E annual report, modified editions of each will be created to encompass the entire data record. These reports will be formatted for web presentation and be published on the YKFP.org/Klickitat website.

Lyle Adult Trap and Hatchery recruitment counts will be transferred to web-enabled tables as they are recorded at the KFO. Real time graphical representations of these data are being developed and tested.

Many informative web pages have already been created and posted on the YKFP.org/Klickitat website, and data and information will continue to be added on an ongoing basis.

g.)The KDSM has worked with the Northwest Environmental Data Network (NED) to identify mechanisms whereby various end users may be identified and provided adequate access to appropriate data and/or information. It appears that any solution the NED process arrives at may be a long time coming. In the meantime, the KDSM will begin the development of detailed documentation of our data sets in metadata to the standard of The Federal Geographic Data Committee’s (FGDC) Biological Data Profile. Well documented relational data sets should be more easily incorporated into the NED framework when such framework evolves. By providing our metadata to the USGS for indexing we, in effect, publish that metadata to a portal searchable on the internet. This

allows any researcher searching for data similar to that which we have to find descriptions of our data, make some determination of its usefulness, and ultimately to contact us requesting use of the data. The KDSM attended a training session on writing and sharing metadata conducted by USGS in September of 2006, and the development of metadata received increased attention in the 2007-2008 project years.

ACCOMPLISHMENTS

H 168. Council 3-Step Process: Step 1: Klickitat Master Plan Revision

Project staff coordinated activities with BPA and their contractor through the project #1988-155-35, with funding established under the BPA/NPCC Budget Oversight Group (BOG) process. Klickitat Design & Construction project funds were used by the team established by Dan Warren & Associates to re-write the April 2004 version of the Master Plan. The Master Plan team focused heavily on the hatchery reform methodologies adopted by the congressionally mandated Hatchery Scientific Review Group (HSRG). The Master Plan has been submitted to NPCC & BPA for review, where at the August 2008 NPCC meeting a decision to proceed to Step II is likely.

ACCOMPLISHMENTS

I 183. Produce Journal Article:

During this review period a single article associated with this project was published in the Canadian Journal of Fish and Aquatic Sciences (*Influence of landscape on resident and anadromous life history types of Oncorhynchus mykiss*).

PURPOSE

Project & Provincial Reviews are a vital part of the annual review and planning cycle that contributes to the research considerations for Klickitat activities within the YKFP. These reviews afford an opportunity for project personnel to interact with scientists who have an interest in supplementation and the resource, and also to give an external presentation to inform the Columbia Basin managers of the current status of activities within the Project. The Project & Provincial Reviews will be recorded, and a document will be produced that provides an accurate and complete record of the proceedings. Project & Provincial Review records will assist the YKFP in Project planning and management activities, and will be made available to regional scientists. The documentation from the Project Annual Review (PAR) Scientific and Management Review will be sufficient to support the requirements of the YKFP EIS policy and program strategic planning for YKFP project direction.

TASKS

<p>a.) Project & Provincial Review</p>	<p>Peer-reviewed publications are the standard of excellence in science. In addition, publications have the potential to be widely disseminated and are part of the scientific record. As such, publications serve as completion reports for certain aspects of the work in the contracts</p>
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ACCOMPLISHMENTS

The YKFP held its first annual Klickitat and White Salmon Subbasins Watershed & Fisheries Science Conference on February 28, 2008 as the format for the Project Annual Review for the Klickitat River. The conference showcased YKFP activities in the Klickitat Subbasin, with a format similar to the Yakima Basin Science & Management Conference. The conference was well attended by a broad spectrum of participants, and feedback was positive, indicating that this event was useful and informative for highlighting issues in the watersheds, research being conducted and the work that is being done to address the issues.

OBJECTIVE

J 99. Outreach and Education: YN/YKFP Klickitat Subbasin Project Outreach and Education

TASKS

a.) Coordinate outreach activities through Klickitat Education and Outreach staffperson	Conduct periodic school visits with USFWS to incubate salmon in classrooms, present YKFP enhancement activities
b.) Conduct outreach activities at community events	Conduct educational outreach activities at community events (i.e. Earth Day, Water Jam, etc.)

ACCOMPLISHMENTS

Task a.): Coordinate outreach activities through YKFP-Klickitat E&O staff person

The collaborative “Salmon in the Classroom” effort between the YKFP and the U.S. Fish & Wildlife Service (USFWS) continued this school year, beginning with an initial meeting between the YKFP HM and another staff person and USFWS staff in early Sept. 2006. This task provides an opportunity to foster a connection between local school children and their local aquatic environment. This interagency effort showcases local and regional efforts by the project partners and Bonneville Power Administration (BPA) to improve habitat conditions for salmon.

USFWS and YKFP personnel coordinated placement of the four tank/chiller units at various schools, but this year were able to serve 5 schools, thanks to scheduling. One recipient was Wishram School, which has had one of YKFP/USFWS’s tanks the previous three years, where the tank is placed in the main hallway where all staff, students and visitors can view it. Two units were placed, as the last two years, in Klickitat and Goldendale schools, plus a new placement at Dallesport Elementary. Another new placement was in Lyle High School’s biology classroom. We were able to double up on one of the tanks and serve both Dallesport and Lyle by using two different stocks of fish for the eggs. In past years, tanks were set up in classrooms in early to mid-October, and tule fall Chinook eggs from Spring Creek NFH generally were delivered the following week. This year, we transitioned to supplying Klickitat Hatchery coho salmon eggs, with a later hatch date. Dallesport still received tule eggs and had their salmon unit in the fall. When they were done, the tank was transferred to Lyle School who, with the other

schools, received their coho eggs in early January. Using local stocks also meant that the students could release the fry they raised into the Klickitat River, which for most schools is easier to manage than a field trip farther away. Some of the schools combined their release with a trip to Klickitat Hatchery, and let the fish into the river there.

YKFP staff had the opportunity to take part in and help teach several lessons during the Salmon in the Classroom (or “Students for Salmon”) unit. YKFP staff taught or helped teach lessons on watersheds and fish habitat in the context of YKFP salmon enhancement work in the Klickitat River Basin in Dallesport, Wishram and Klickitat schools in Spring '08.

YKFP E&O staff also attended a Parents’ Night at Klickitat School showcasing what the students had learned in their Salmon unit. A YKFP display provided information about historic and current fisheries in the Columbia and Klickitat, and the model the Yakama Nation (YKFP) endorses to rebuild salmon runs in the Klickitat River basin. YKFP and USFWS played a game show-style game with all students, parents and teachers in attendance that tested their knowledge of salmon. (The students won, of course).

In addition, YKFP staff visited four of the schools and presented information about the cultural and historic local context around salmon fisheries, including dip-netting demonstrations from a YKFP technician and tribal member.

Coordination efforts between YKFP and USFWS are ongoing for the 2008-2009 school year, with the possible inclusion of more Klickitat area schools. The YKFP and USFWS teamed up with several other agencies and organizations to put on the two-day “Water Jam”, a fun and educational culminating event for area 4th-6th graders in Klickitat County in late May 2008. YKFP had a display about watershed restoration and an interactive “Rebuild a Watershed” activity. YKFP also provided a tribal storyteller which was an integral and well-liked component of the event. Planning for next year’s Water Jam will begin in fall 2008.

Tours of the Klickitat Hatchery are becoming integrated into the salmon in the classroom curriculum, as several participating schools visited the Hatchery during this year’s program. YKFP, hatchery and USFWS staff coordinated activities for the students to extend what they had learned raising the fish in the classroom.

Information on the YKFP/USFWS partnership is available on the USFWS website (<http://www.fws.gov/gorgefish/springcreek/outreach.htm>). The Education & Outreach page of the YKFP-Klickitat website (<http://www.ykfp.org/klickitat/EandO.htm>) also has information and photos from classroom visits, as well as community outreach and other events. YKFP staff hopes to continue visiting other schools to present lessons about the historical, cultural and ecological significance of salmon and salmon fisheries.

Task J99.b: Conduct outreach activities at community events

During this reporting period, Yakama Nation staff presented information about BPA-funded YKFP Klickitat Basin activities at various community events. At these events, such as Earth Day in Goldendale (April 19, 2008), Yakama Nation staff provided information through manned displays, slideshows and handouts about historical context, ongoing and future YKFP activities. YKFP staff also presented on cultural and educational issues around fisheries at career days in the White Salmon middle/high school and had a display at the Klickitat & White Salmon Fisheries and Watershed Science Conference held in The Dalles, OR February 28, 2008.

OBJECTIVE

K 141. Produce Other Report: YN/YKFP - Klickitat Project Status Report

PURPOSE

Produce an annual report detailing the accomplishments for each work element of the Klickitat Management, Data & Habitat Contract

TASKS

a.) Prepare and submit progress reports as required by contract	Contract overlaps Federal FY; 1st Status Report is for two months of the 3rd Quarter the first FY.
b.) Prepare and submit progress reports as required by contract	2nd Status Report
c.) Prepare and submit progress reports as required by contract	3rd Status Report
d.) Prepare and submit progress reports as required by contract	4th Status Report
e.) Prepare and submit progress reports as required by contract	5th Status Report, contract overlaps Federal FY; this will be the last Status Report due for this contract and will be a one month report

ACCOMPLISHMENTS

Task a. – e.): Project Status Reports were prepared and submitted to BPA’s PISCES web-based reporting system.

OBJECTIVE

L 132. Produce (Annual) Progress Report: YN/YKFP - Klickitat Project Annual Report.

PURPOSE

Produce an annual report detailing the accomplishments for each work element of the Klickitat Management, Data & Habitat Contract.

TASKS

a.) Draft Annual Report	Produce a draft annual report detailing the accomplishments for each work element of the Klickitat Management, Data and Habitat contract
b.) Annual Report	Produce an annual report detailing the accomplishments for each work element of the Management, Data and Habitat contract

Additional Notes:

A comprehensive progress report will be prepared each federal fiscal year (FY) that will describe accomplishments and will report generally on the progress to date on each Work Element (WE) in the Scope of Work. A financial statement will be prepared as part of the report to reflect budget vs. actual expenses (year-to-date), including expenses per WE.

ACCOMPLISHMENTS

This report is submitted as the accomplishment for this Task.

OBJECTIVE

M 119. Manage and Administer Projects:
YN/YKFP - Klickitat Project Management and Implementation

PURPOSE

Coordinate and oversee implementation of all YKFP activities in the Klickitat Subbasin, including development of statements of work; development of YKFP-sponsored project and contract budgets; compliance with all applicable laws and environmental review requirements; subcontractor procurement and management; fiscal management; financial reporting; annual operating plan development; performance of YKFP research, monitoring/evaluation and operation/maintenance contracts; master plan development; and attendance at training, conferences and meetings.

TASKS

a.) Prepare SOW, Budget Proposal & Monthly Spending Plan	Summary of completed and planned budget
b.) Financial Reports	Prepare and submit financial status reports on a monthly basis
c.) Equipment Inventory Report	Prepare, update and submit report as required

d.) Conferences, Training, Meetings	Attendance at and/or participation in conference/training/meetings for one manager, 4 bios, and 3 support staff members. This may include, but is not limited to, Policy Group meetings, planning meetings, conferences and OMB circular updates for new P.L. 106-107
e.) Technical Writing	Update Master Plan and other documents based on ISRP and NPCC review process
f.) Submit 09/30/06 Accruals	Submit annual accruals to BPA as requested
g.) Obtain Policy/Legal Analyst Services	Obtain consulting support to assist in the following areas: administrative, management, personnel, labor, NEPA/ESA, local and state permitting requirements and general contract law. This is an on-going need, and YKFP/YN chooses to continue to secure the services of Patrick D. Spurgin, Attorney at Law, 411 N. 2nd St., Yakima, WA 98901.
h.) Obtain Engineering Consulting Services	Obtain consulting support to assist in the following areas: engineering review and update of Master Plan as needed from ISRP and NPCC reviewers, local and state construction permitting requirements and general AIA contract law. This is an on-going need and YKFP/YN chooses to continue to secure the services of Harbor Consulting Engineers, Inc., 3006 Fuhrman Avenue East, Seattle WA 98102

Additional Notes:

Expansion of YKFP integrated hatchery and hatchery reform activities in the Klickitat Subbasin required the support of the YKFP- Klickitat Hatchery Manager (YKFP-KHM) to facilitate integration of proven hatchery reform technologies from the YKFP’s Cle Elum Supplementation & Research Facility (CESRF) to the Klickitat Hatchery. The YKFP-KHM, with 7 years of work experience at the CESRF, provides the institutional knowledge of YKFP facility requirements useful to integrate both YKFP fish culture practices and assist with engineering planning and design development.

OBJECTIVE

N 185. Produce PISCES Status Report: Periodic Status Reports for BPA

PURPOSE

Report on the status of milestones and deliverables in Pisces. Reports are completed either monthly or quarterly as determined by the BPA COTR.

ACCOMPLISHMENTS

This activity was completed per BPA Pisces reporting guidelines.

ATTACHMENT A

Legal/Policy Analyst Summary Report

**Patrick Spurgin
Attorney at Law
411 North 2nd St.
Yakima, WA 98901
ID#91-2106103**

The Legal/Policy Analyst (L/PA) responsibilities are to advise management on the benefits and risks associated with actions considered by the decision-makers. Through this contract performance period, the L/PA maintained a close working relationship by attending/participating in meetings that pertain to the Project, reviewing and reporting on legislation, laws, administrative actions and regulations that affect the YKFP and participating in the planning/development process for the Project.

In summary, during the FY2007/2008 contract period, the L/PA provided the following services to the YKFP:

1. Assisted the PAPC and the YKFP Policy Group in project administration and management.
2. Analyzed applicable laws, rules and regulations pertaining to Project funding, water rights, NEPA, SEPA, ESA, and other environmental compliance requirements.
3. Advised PAPC and Policy Group as to the matters identified above.
4. Assisted in the preparation of NEPA and SEPA and regulatory compliance documents.
5. Assisted in the development of regulatory permit applications.
6. Supported the development and maintenance of intergovernmental relationships between the Yakama Nation, BPA, WDFW, NPPC, and local governments.
7. Reviewed, negotiated and prepared project contracts and agreements.
8. Attended Policy Group meetings and other key YKFP meetings, as requested, and advised PAPC and Policy Group regarding issues discussed.
9. Attended regional meetings wherein the topics discussed could affect YKFP activities.

10. Advised and assisted the PAPC with regard to issues of concern related to YKFP.

Specifically, the L/PA performed tasks in the following major areas:

1. Lyle Falls

In the course of developing a Klickitat Subbasin Anadromous Fish Master Plan, the Yakama Nation, the NPCC and BPA determined that fishway improvements would be useful for resource management irrespective of the ultimate contents of the master plan. Accordingly, the L/PA continued to assist YKFP and BPA staff in developing environmental review documents necessary for federal, state and local decisions on fishway and adult enumeration facility development.

The facility also was the subject of interest by a television program production company that was interested in depicting tribal fishing and resource management activities at Lyle Falls. The L/PA assisted the YKFP managers in addressing tribal authorizations for television production activities in order to support YKFP public education objectives.

2. Klickitat Watershed Enhancement Project

The Klickitat Watershed Enhancement Project (KWEP) identifies opportunities for restoration of habitat within the Klickitat subbasin that has been affected by human activities. The project plans, designs and implements improvements. Improvements include increasing channel complexity through engineered large woody debris structures and replacement of culverts. The Yakama Nation enters numerous subcontracts in implementing its intergovernmental contracts with BPA, including the IGC that provides funding for the KWEP. The L/PA worked with Yakama Nation administrative staff to update subcontract terms in order to assure the implementation of the IGCs and protection of Yakama Nation interests in the contracting process.

3. Long Term YKFP Funding

At the same time that the NPCC was developing funding recommendations for the FY 2007-2009 budget period, BPA was negotiating with tribal governments in the region regarding long term funding of fish and wildlife mitigation activities in the context of litigation over the adequacy of endangered species protections for anadromous fish. The

L/PA participated in the development of YKFP Klickitat project needs assessment to support on long term funding agreements. The L/PA also supported tribal participation in associated government to government interactions with BPA managers and the development of interim funding approaches for YKFP projects affected by NPCC budget recommendations.

In the course of long term funding discussions, BPA identified concerns they held with respect to mitigation activities that depended on changes to management and production of fish species propagated using federal Mitchell Act funding. The L/PA assisted YKFP managers in developing strategies for resolving BPA's "in-lieu" funding concerns and in developing appropriations proposals to implement the strategies.

4. Klickitat Anadromous Fish Master Plan

The YKFP is proposing to improve artificial fish propagation methods and facilities in the Klickitat subbasin using supplementation concepts examined in the Yakima subbasin at the Cle Elum Research and Supplementation Facility. The concepts are being tailored to the specific conditions presented by naturally producing and artificially propagated anadromous fish in the Klickitat and have been incorporated into a master plan that was submitted to support funding by BPA through the NPCC three step review process. The L/PA assisted YKFP staff in developing the master plan to meet applicable review and scientific justification requirements.

5. Columbia River Basin Legislation, Regulation and Litigation

Activities. The YKFP operates in a context of federal, state and tribal decision-making at both the legislative and regulatory levels. The YKFP is obliged to monitor legislative, regulatory and litigation activities in order to anticipate changes in project environments and to allow effective participation in future funding and policy decisions. The L/PA monitored such activities and made appropriate reports to YKFP managers in order to allow such effective participation. In particular, the L/PA worked with YKFP managers to develop strategies for participation in local land use planning and project review to assure protection of current and future fisheries and habitat resources in Klickitat County.

6. Klickitat Fish Hatchery Management Agreements. The Klickitat Fish Hatchery, which constitutes a crucial element of the Klickitat Anadromous Fish Master Plan, is managed by the Yakama Nation under a lease and operating agreement with the

Washington Department of Fish and Wildlife. The L/PA assisted YKFP and WDFW managers in developing new lease and operating agreement documents to continue YKFP management of the facility during the course of master plan development. In addition, the YKFP was obliged to address new regulatory requirements as a result of its operational responsibilities, and the L/PA assisted managers in dealing with regulatory authorities and requirements at the facility.

ATTACHMENT B

Engineering Summary Report

**Harbor Consulting Engineers, Inc.
3006 Fuhrman Avenue East
Seattle, WA 98102**

Harbor Consulting Engineers provided professional services to the Yakama Nation under the on-call services consulting agreement for May 1, 2007 thru April 30, 2008. During this time, we continued our efforts on the Lyle Falls Fishway, Wahkiacus Hatchery planning, McCreedy Creek Acclimation Site and Castile Falls adult capture and PIT-tag interrogation. The following summary describes services provided by Harbor Consulting Engineers during this contract period.

1. Coordination with the YN biologists, scientists, and archaeologists regarding the Lyle Falls EIS. There has been considerable effort expended on behalf of the tribe to explain the design features of the Lyle Falls Fishway. This effort continues, responding to ongoing concerned agency questions regarding the proposed fishway improvements. Harbor Consulting Engineers continues to be available for response to reviewer questions relative to the Lyle Falls EIS and Master Plan.
2. The Klickitat River Fisheries Master Plan development relating to facilities, their construction cost and facility purpose has required extensive input by Harbor Consulting Engineers including drawings, construction costs and narratives. Harbor has strategized with the Yakama Nation to maximize the potential facility production using current fish husbandry technology.
3. Continuing efforts towards the re-development of the Wahkiacus Hatchery and Acclimation Facility Plan, construction cost and narrative including coordination with Klickitat County Engineering Department. Harbor consulted with county engineering department representatives, identifying county plans for new bridge construction over the Klickitat River. We then revised the planned development of the Wahkiacus Hatchery to accommodate the updated Klickitat Basin Master Plan, and planned Klickitat County road and bridge improvements.
4. Harbor conducted further study of the McCreedy Creek Acclimation Site re-development using portable aluminum raceways consistent with YN land use requirements. Per Yakama Klickitat Fish Program (YKFP) Master Plan, the McCreedy Creek Acclimation Site project is postponed to allow evaluation of natural re-colonization rates.

5. Harbor continued research of PIT-tag interrogation technology and conducted site visits to Columbia River PIT tag facilities, Klickitat River sites at Lyle Falls, Wahkiacus and Klickitat Hatchery site, and Castile Falls 10 & 11. Current PIT tag systems used by NMFS were reviewed including the latest in PIT tag antennae design. Preliminary cost estimates were developed for installation of PIT tag systems at Lyle Falls, Klickitat Hatchery and Castile Falls 10 and 11.

6. Castile Falls –

A. Continuing conceptual design of this adult capture facility and PIT tag interrogation with remote monitoring capabilities included satellite communications with real-time monitoring. The PIT-tag interrogation station and support building has been designed to accommodate necessary video and computer equipment. This building can also support the adjacent adult capture operation. An on-site propane-powered engine generator is also provided in this schematic design supporting both facilities.

B. Castile Falls Fishway -Tunnel Operations Review.

Harbor conducted site visits to Castile Falls 4/5 to assess fish ladder bedload conditions to determine operational or design measures which would reduce bedload buildup.

7. Klickitat field office & proposed hatchery configuration with WSDOT bridge replacement. Harbor reviewed existing information available of proposed replacement of the Horseshoe Bend Bridge on SR 142 at the Klickitat Field Office (KFO). Impacts to the current Wahkiacus Hatchery & Acclimation Facility design and KFO flood conveyance were also examined.

ATTACHMENT C

Klickitat Information System Management Plan YKFP Klickitat Subbasin Data Management Plan Assessment of the Body of YKFP Data collected on the Klickitat Basin

Prepared by

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Introduction

Since the mid 1990's, a great deal of Klickitat Basin data has been collected by Yakama Nation (YN) Fisheries through the Yakima/Klickitat Fisheries Project (YKFP). This generally consists of fish population and habitat data. The following summarizes the present state of data and data management for the YKFP.

This data management plan is an evolving process that will:

- list the areas of past, present and future data collection;
- identify the reasons these data are collected (what questions are we trying to answer? What information are we trying to gain?);
- identify entities that need access to these data, and in what form (i.e. summary reports, raw data);
- assess the present state of the data, including a detailed discussion of where and in what format the data are presently stored
- explore possible options for future storage and organization of these data and reach consensus with the users as to acceptable options (can we answer our questions?)
- create a work plan for getting the data into the form we decide upon.

Fish-Centered Data

Juvenile Data

Rotary screw trap data

The YKFP has been collecting rotary screw trap data on the Klickitat since as early as 1995.

Data modeling began on a screw trap database in early 2003. This database was created, and a data entry and editing form was created. Prior to this, all rotary screw trap data had been stored in various Quattro Pro and Excel spreadsheets on computers in Toppenish as well as at the Klickitat Field Office (KFO). This was problematic for two reasons:

1. Decentralized storage with multiple users generated multiple versions of the data.
2. Analyzing the data across larger time spans often required manually sorting through several spreadsheets with varying formats, which complicated comparisons.

The data in these spreadsheets for the Castile and Hatchery rotary screw traps have been imported into the new database, as have all data from the new Lyle rotary screw trap location.

Due to manpower constraints, some data from the old Lyle screw trap location and early screw trap deployments on some tributaries have yet to be imported. This data is stored on the M&E biologist's desktop machine. Until such time as the manpower becomes available to import this data, it will be documented and archived as is.

The screw trap database tracks the following entities:

- Deployments of the traps: including the start date and time of each deployment, end date and time of each deployment, and reason for the end of each deployment.
- Trap checks during each deployment where various environmental data relating to trap sites at the time of trap check are recorded.
- For checks where fish are tallied, we record data reflecting tallies of the various species captured in the traps.
- Work-up data: lengths, weights and smolt rank of various target wild and hatchery species are recorded and tracked when this information is collected in a trap check.
- In September of 2004 additional functionality was added to the work-up component of the Screw Trap database to allow a photographic record and a reference to DNA samples to be stored within the work-up records. This data collection work was subsequently abandoned.

Artificial production release information

Artificial production release data (species, location, timing, numbers, and size at release) is collected on an ongoing basis. Currently, this information resides in the Regional Mark Information System (RMIS) maintained by the Pacific States Marine Fisheries Commission (PSMFC). This is a database of all releases reported by governmental and tribal agencies (on the internet at <http://www.rmpc.org/wrapper/2.html>). It contains all data that have been submitted there. This is the most complete and reliable source for release information for the Klickitat River but it tends to lag behind real time. More current release information from the Klickitat Hatchery is provided by the Klickitat Hatchery manager. Eventually, the YKFP may choose to develop a relational database that would allow this data to be used more effectively in conjunction with existing data, such as carcass counts from spawning surveys. A second source for release information is the Fish Passage Center (<http://www.fpc.org>). Both of these sites are used to get the most comprehensive picture of release data.

PIT tags

The YKFP is in the process of developing formal programs to monitor outmigration timing and holding patterns of wild fish using PIT tags implanted in fish intercepted at the rotary screw traps. Mobile tagging stations consisting of tag readers and scale- and length-measuring devices connected to computers running the PTAGIS software have been incorporated into the data collection process. Field crews have received training on the use of field equipment for tagging and data capture procedures. Subsets of hatchery releases have been PIT-tagged. All tagged releases will be submitted to PTAGIS using the P3 software provided by the PSMFC after being checked by YKFP data managers to assure proper formatting and successful transmission. We may get a secondary benefit of screw trap efficiency estimates from this study. We will also likely get some information on out-migrations and returns from PIT-tag detection equipment already in place at

Bonneville Dam. While the YKFP is able to get some indication of the survival rate of PIT-tagged fish by detecting and reclaiming tags in collected pond mortalities, not all mortalities can be collected. The YKFP is currently experimenting with PIT-tag detectors at the outlet of a hatchery pond from which tagged fish are released in order to get a more accurate record of mortality and actual released fish. These tests have indicated that redundant readers will be needed to get an accurate reading of released PIT-tagged fish. Future utility of PIT-tag data may include assessing abundance, movements, and migration timing of tagged fish in tributary streams.

Adult Data

Spawning survey data

All Klickitat spawning survey data is currently stored and maintained by the Klickitat M&E Biologist. It has been suggested that a modification of existing databases already developed for Yakima Basin spawning ground surveys be applied in the Klickitat. If these data structures can be sufficiently adapted to meet the methods and needs of Klickitat field biologists, past years' data could be imported from existing spreadsheets. This task will involve the concerted effort of both our M&E Biologist and Klickitat Data Systems Manager (KDSM). The present storage mechanism will be sufficient until such time as we can devote the necessary resources to this task.

Lyle adult trap data

From June 2004 through February 28, 2006, a joint project with the YN and Washington Department of Fish & Wildlife (WDFW) assessed immigration to the Klickitat River at the Lyle Falls fish trap. These data were jointly managed by WDFW and YN. WDFW's project ended on February 28, 2006. Future operation of the Lyle Adult Trap will be accomplished by the YKFP. The KDSM worked with the Klickitat M&E Biologist to model and build a database for the Lyle Adult Trap data. This database will be stored at the KFO. At such time as we are able to secure adequate bandwidth, each time data in this database is updated, a query will run to update a database table on the YKFP web server. Until adequate bandwidth becomes available, the web table will be updated manually as time and manpower permit. Automated scripts are being developed to graphically present this data on the web.

Tribal harvest data

Yakama Nation Tributary Catch Estimates are available through the YN harvest manager in the Toppenish, Washington office.

Non-Tribal harvest data

The KDSM understands that WDFW maintains sport fisheries harvest data for the Klickitat River and that the Joint Columbia River Management Staff (Oregon and Washington Departments of Fish and Wildlife) maintains harvest data for the Columbia River. YKFP Data Managers will work with the appropriate parties to obtain these data as necessary.

Run reconstruction

YKFP staff is continuing to investigate methods that will provide valid and reliable estimates of adult runs of each target species returning to the Klickitat each year. Data presently available for run reconstruction are:

- commercial, tribal and sport harvest between Bonneville and The Dalles dams and in the Klickitat;
- adult return estimates for other tributaries and hatcheries between the two dams;
- spawning ground survey information for the Klickitat Basin and
- adult return information collected at the Lyle Falls Adult Trap.

Planned modifications to the Lyle and Castile Falls fishways will greatly enhance our ability to accurately determine run size and escapement data.

In the past, WDFW had compiled all relevant data on spring and fall Chinook, and calculated run reconstruction. YKFP Klickitat spawning survey data was submitted to the WDFW to be used in these calculations. Beginning in 2006, the YKFP Klickitat M&E Biologist and Data Managers assumed responsibility for calculating run reconstruction for Klickitat River spring Chinook. Fall Chinook remain the responsibility of WDFW.

Klickitat Hatchery returns

Klickitat Hatchery production and return data remain the responsibility of the Hatchery Manager. Adult return data is recorded daily at the Klickitat Hatchery during adult recruitment. Mechanisms are in place that allow these data to be updated to the web manually, shortly after it is collected. A presentation of the counts is available to the public at http://www.ykfp.org/klickitat/hatch_AdultReturns2008.htm. The present process involves several steps for hatchery personnel and data managers. Improved internet connectivity would allow hatchery staff to update the web site themselves, eliminating the need to pass the information through data management and allowing closer to real time data presentations.

Data assessing both juveniles and adults

Scale age readings

The YKFP collects scales for age analysis via several sampling techniques (e.g. Lyle Adult Trap, electrofishing, hatchery spawning, rotary screw trap and in-stream spawning surveys). At present, the most accessible juvenile scale-age data reside on the desktop machine of the Yakima Nation Fisheries Scale and Tag reader in Toppenish. The actual scale cards (raw data) are also stored in Toppenish. These data do need to be quality checked (QC'd) by a qualified biologist. In the past, this QC has been done on subsets of the data as needed for reports, leaving the main body of data in a provisional status. It would be advisable to build this into a validated body of data. A normalized relational database has been developed to store all of our scale age data from 2007 forward. Mechanisms will be developed to incorporate the data collected prior to 2006 into this data set.

Scale ages are read and recorded in Toppenish, Washington and most analysis and use of this data occurs at the KFO nearly 100 miles away. For this reason, a database to store these data has been developed and placed on a remote server where users can interact with it via an ODBC connection from either site.

Two YN Fisheries technicians were trained in scale age reading in the 2007-2008 project year; one reader from the Klickitat Basin and one from the Yakima. These two

technicians will take over scale reading responsibilities for their respective watersheds, backing each other up and validating each other's work.

Population & presence/absence data

A lot of sampling throughout the Klickitat Subbasin has been conducted by various organizations assessing characteristics of individuals and populations. These studies have, for the most part, been performed independently of one another, so they share no common data structure. It was determined that a database cataloguing the studies done and methodologies used would be very helpful in organizing and utilizing this body of knowledge. M&E and habitat biologists collaborated with the KDSM to develop an Entity Relationship Diagram and a physical data model. The database will document locations where sampling has occurred, what type of data was collected, methods used, and what species were found. An Access database and data input forms were created. Due to the multiple, more pressing demands placed upon the biologists, data input has been deferred. Hard copies of existing data reside at the KFO.

DNA analysis

A database was created to store tracking data on DNA samples obtained by various techniques from target population fish throughout the basin (DNASampling1.mdb). These data have been shared with CRITFC biologists who perform the actual DNA analysis. We will incorporate information obtained through these analyses into future work as it evolves. Knowledge attained through DNA research may help inform management and recovery decisions and add to our baseline knowledge of the Klickitat Basin's anadromous fish populations.

Habitat Data

In addition to fisheries data, there is a considerable body of physical habitat data, particularly on habitat conditions, large woody debris, temperature, stream flow, and sediment. The Klickitat M&E Project is the principal effort charged with monitoring physical habitat data. However, the Klickitat Watershed Enhancement Project (KWEP) staff assists the M&E project by taking on oversight of data collection and management as well as data analysis.

Stream habitat

Stream habitat assessments using protocols developed by the Timber, Fish and Wildlife (TFW) Monitoring Program began in 1995 and have continued through 2007. These surveys consist of the Reference Point, Habitat Unit, and Large Woody Debris survey modules. This information was stored in individual Quattro Pro spreadsheets by location (66 different files) until early 2001 when it was imported into a newly developed Access database. An inventory of the Quattro Pro source files by KWEP personnel found all or some of them located on seven different computers in three different YNFP offices. Some files had as many as 5 different versions distributed among the various machines. This illustrated a definitive need for a single centralized database that could be accessed remotely by various end-users. The TFW Access database developed by KWEP and YKFP Data Management personnel was the first continuous effort at organizing Klickitat subbasin data into a relational database. This model worked well for storage and analysis

of existing data, though editing and new data entry were complicated. In 2004 KWEP personnel and KDSM created a logical relational data model and a physical Access database for the storage of this data. Quality assurance work has been ongoing. Major modifications in the model's logic and table structure are complete, and minor adjustments are being identified and implemented on the fly. Importation of existing electronically stored data into the new physical database (TFW version 5.1) is complete. Following importation, data input and editing forms were created to facilitate a comprehensive quality check of existing data back to the original data sheets for all sites and to allow entry of more recent survey data. At present, 90 sampling sessions at 79 segments of 38 streams located throughout the basin are recorded in the TFW5.1 database. A standard set of reports has been developed that can be used for analysis and periodic reporting. Staff is also working to integrate this database with GIS for mapping capability.

Temperature (Hobo3.mdb)

A relational database has been created to house water and air temperature data collected since 1995. Prior to 2003, all data collection, management, and analysis were conducted by M&E personnel. Data was stored in individual Excel spreadsheets by site (34 different files). In early 2003, oversight of temperature monitoring was transferred to KWEP personnel who worked with KDSM to develop a logical relational model.

Based on this model, KDSM created a physical Access database, error-checked and imported pre-existing data. In 2003, phasing-out of all HoboTemp devices was begun and they were replaced with Optic StowAway devices at water temperature sites and HOBO-H8 devices at air temperature sites. Stowaway and HOBO-H8 sensor/loggers have greater memory and can store a full year's worth of data at 30-minute intervals.

Previously, HoboTemps logged at 1-hour, 12-minute increments and had to be swapped every 90 days. This occasionally resulted in data gaps when devices at sites with seasonally restricted access would fill up and stop logging before they could be replaced. It also required a greater labor effort because they had to be checked more frequently, and data resolution was lower because they logged at greater increments. The new devices should allow us to get more continuous data from sites that are inaccessible for large portions of the year.

The H8s have comparable accuracy ($\pm 0.7^{\circ}\text{C}$) to the HOBO-Temps while the StowAways are more accurate ($\pm 0.2^{\circ}\text{C}$). Raw data are plotted and checked for spiking, drift, and other data irregularities prior to importation to the database. Since 2004, all sensors are calibrated in an ambient water bath to an NIST-certified thermometer at least once a year. The 30-minute sampling increment, NIST calibration, and greater device accuracy have increased our data quality to be comparable with WDOE and USGS standards. Air temperature stations are utilizing the HOBO-H8 devices as they provide a greater sensing range (-20°C to $+70^{\circ}\text{C}$) than the StowAways (-4°C to $+37^{\circ}\text{C}$). Matching nearby air temperatures to our stream readings is very useful in determining when and if a water temp logger has come out of the water. We are working to place air temperature loggers within close proximity to our water temperature loggers, especially at sites prone to flow patterns that put our loggers out of the water. A useful set of pivot charts and an advanced data summary report have been developed for this database and will be refined as necessary. We will work to automate data importation as time allows.

Stream flow data

Collectively, there are 37 active and historic stream gage sites in the Klickitat subbasin. There are many other locations where instantaneous measurements have been made in the absence of a staff gage or benchmark. The KDSM's role in organizing and managing these data has yet to be addressed.

-USGS flow data

The USGS has operated as many as 15 locations over the years, twelve of which collected hourly or daily data. Of these, three are currently active: Klickitat River at Pitt (#14113000), Klickitat River below Summit Creek (#14111400), and Klickitat River above West Fork (#14070000). Real time data are available online from the sites at Pitt and above West Fork. Data for the current water year (October 1 – September 30) are available for the 30 days prior to an online query but are considered provisional. Data for a given water year are generally not published until roughly 18 months after the initiation of that year, though they can generally be obtained provisionally by contacting USGS personnel directly. The KDSM will establish a working relationship with the USGS staff to secure access to flow data from these sites as close to real time as possible. These data will be stored locally with links to the other applications such as the Screw Trap database where they will be necessary in establishing efficiencies.

-Yakama Nation flow data

The YN has 22 staff gages deployed throughout the subbasin. Measurements to maintain ratings on these sites are conducted primarily by YN Water Resources Program personnel funded through KWEP. Six of these currently have crest gages and seven have data loggers. KWEP personnel plan to install three more data loggers by the end of 2008. These data are presently maintained by KWEP personnel but will likely be incorporated into the temperature database at some point because the data structure is so comparable.

Substrate

Substrate data have been collected at numerous locations throughout the Klickitat subbasin since 1998. Depending on the information needed and time available for collection, two different procedures are used: bulk sampling and pebble counts.

- The bulk procedure is used to monitor spawning gravels and uses a McNeil sampler for collection. This monitoring began in 1998 at three sites and has averaged 10 sites per year since, with a total of 18 sites being sampled since 1998. Gravel samples have been collected by Klickitat M&E project technicians and processed at the Toppenish office by BPA-funded Yakama M&E technicians. This data was managed by Klickitat M&E personnel until 2003 when it was transferred to KWEP personnel.

Data that resided in Excel spreadsheets has been transferred into a normalized relational Access database, and standardized charts have been developed as analytical tools. KWEP personnel have inventoried the data and are documenting current and historic collection sites for incorporation into a geodatabase.

- Pebble count data have been collected at various locations throughout the basin to characterize surface sediment. The single largest effort was conducted by the YN Fisheries Program with a BIA Grant in 2001-2002 to document baseline conditions throughout the Reservation Forested Area (many sites were outside the Klickitat Subbasin). Pebble counts have also been conducted in association with KWEP, primarily

for design of restoration projects, though locations not disturbed during restoration activities could be re-visited subsequently for monitoring. Because there is not currently a recurring monitoring effort using this methodology, incorporation of these data into a relational database would be of a much lower priority.

Culvert and road assessments

During 2000 and 2003, a total of 82 culverts were surveyed at 69 on-Reservation road crossings of Klickitat River tributaries to determine their status as fish passage barriers. Survey protocols developed by the Washington Department of Fish and Wildlife were used. Klickitat M&E technicians conducted the field surveys after being trained by WDFW personnel on the protocols. The data were managed by Klickitat M&E personnel until 2003 when they were transferred to the KWEP Watershed Specialist. Data currently reside in Excel spreadsheets on the KWEP project manager's computer. The priority of these data has not yet brought them into the active work space of the KDSM. While storage and retrieval of the data would benefit from incorporation into a relational database, the small size of the record set, the fact that barrier status has already been determined for surveyed crossings, and that surveys are not an ongoing effort makes these data a lower priority.

Several other road assessment projects have also been carried out, primarily in the White Creek watershed with expansion to other watersheds in 2005. Information from these projects includes GIS analysis of road/stream attributes, field survey results, and recommended road improvement prescriptions. Information is available from the KWEP Watershed Restoration Specialist or M&E/Habitat Biologist.

Habitat restoration projects

The KWEP Watershed Specialist and the KDSM have begun preliminary modeling of a database/ geodatabase that will store logistical, administrative, and operational project data linked to project locations. A first attempt at this complex modeling project resulted in a data structure that proved difficult to query and manipulate. What is needed here is specialty Project Management software. The YKFP will explore the feasibility of using one of the "off-the-shelf" solutions commercially available. If suitable existing software is located, a cost/benefit analysis will compare its implementation to in-house development.

Carcass analog project data

This project was carried out in 2002-2004 and involved nutrient enhancement (via placement of carcass analogs) in several Klickitat tributaries, and monitoring responses of fish populations and other parameters. Data were collected on fish abundance and growth; nutrient levels in fish, invertebrate, and periphyton tissue; and water quality. All existing raw data reside with the M&E Biologist at the KFO on spreadsheets and hard copies. All data has been compiled and analyzed; the analyses and conclusions were published in a report to BPA (Zendt and Sharp 2006). Due to the relatively short term and the unique nature of the project, incorporation of these data into a relational database was not considered a priority. Some fish distribution and abundance information from this project may, however, be included in the fish distribution database discussed above

(under *Population and Presence/Absence Data*). Zendt, J. and B. Sharp. 2006. Influences of Stocking Salmon Carcass Analogs on Salmonids in Klickitat River Tributaries. Project No. 200105500, BPA Report DOE/BP-00007534-1.

<http://pisces.bpa.gov/release/documents/documentviewer.aspx?doc=00007534-1>.

EDT model

The EDT model is maintained and controlled by the YKFP Environmental Planner. The KDSM interactions with the EDT modeling process have been limited to the fulfillment of data requests on stream temperatures and TFW habitat survey data. The KDSM will continue to provide data to the EDT modeling process as necessary.

GIS data

Since 2000, a considerable body of spatial information has been created and obtained for the Klickitat Subbasin. Source data for most base layers (e.g. roads, towns, political boundaries, streams, etc.) have come from sources such as WDFW, WDOT, BIA Forestry-Yakama Agency, Interior Columbia Basin Mapping Project, and USGS. Additionally, YKFP specialists have developed spatial data for barriers, monitoring sites, restoration projects, spawning surveys, and habitat inventories. These data are used primarily by three different YKFP specialists and the Data Systems Specialist (GIS) at Nelson Springs, WA. The raster files such as digital elevation models (DEMs), digital orthophotos (DOQs), and digital topographic maps (DRGs) are generally large files with static content that make back-up operations very time consuming. For these reasons, the design and development of a centralized GIS database would be very beneficial. Ideally, all base data could be served from a single ArcSDE geodatabase. It is unclear if raster data could be stored in the same format, but even if not, single copies could still be centrally stored on the network to eliminate the redundancy present in current management of these data. The KWEP Watershed Specialist has already compiled much of these data into personal geodatabases on his desktop computer, though availability of metadata is limited. It would be desirable to reacquire base layers from original sources when compiling the ArcSDE geodatabase. The Data Systems Specialist (GIS) is working with the assistance of the KDSM to implement a centralized geodatabase using ESRI's Arc Spatial Data Engine (SDE) software backed by a Microsoft sqlServer. Geodatabases developed by The KWEP Watershed Specialist and the Data Systems Specialist have been imported, and in some cases created, in the SDE. Some ongoing stability problems in the hardware and/or software have, at times, limited the usefulness and availability of the SDE. The Data Systems Specialist (GIS) and the KDSM are working to secure the long-term stability of the SDE.

Water quality data

Data modeling was conducted and a database was created for water quality samples collected throughout the basin. Temperature, specific conductance, dissolved oxygen and alkalinity (pH) are the parameters to be tracked at several sites. Hard copies of the data are maintained by the M&E/Habitat Biologist at the KFO and are entered into the database. Further development will occur as necessary throughout the process of data entry and evaluation.

Forest management/timber sale project files

Project files for timber sales and other forest management activities in the on-Reservation portion of the Klickitat Subbasin are maintained by the YN Forestry Biologist at the KFO. Information on file includes fisheries and other resource reports, maps, silvicultural prescriptions, and environmental assessments.

Hatchery Data

The management of hatchery data is accomplished by YKFP staff. Information is shared with WDFW (Region 5 – Vancouver and Olympia) as well as NOAA-Fisheries (Portland). Klickitat Hatchery personnel will continue to collect the same data but may change to forms and data structures presently in use at the YN Cle Elum Hatchery. It is assumed that the remaining data management functions presently served by WDFW in Olympia will be taken over by the YKFP. The YKFP anticipates a considerable increase in the coded wire tags (CWTs) and scales to be processed, read and recorded from hatchery returns.

Information Technology Infrastructure

Network/hardware

The information technology infrastructure at the KFO is a Microsoft network of desktop workstations, laptops, servers, printers and specialized periphery devices. The network is a Windows 2003 domain.

Connectivity

Internet connectivity is accomplished via satellite uplink providing data transfer rates much faster than dial-up but not as fast as DSL. A fiber optic cable has been placed adjacent to the property but remains dark. The status of this cable will be monitored in anticipation of utilizing it for data transfer in the future.

Software

The operating systems are Microsoft Windows 2000, XP, and Server 2003. The software includes Microsoft Office, but the different biologists make use of a wide assortment of software from multiple sources.

The primary database to date has been MS Access. MS SQL Server is installed on a central server and will be the basis for ArcSDE. Future database development will have databases in SQL Server with an Access or ASP web page front end.

Security

All of the computers within the Local Area Network (LAN) are password protected as are the applications. Corporate anti-virus is set to auto-protect all file systems and e-mail clients, and spy software detection is run regularly. All sensitive data is backed up recurrently to removable hard drives.

Data Sharing

The YKFP will continue to exchange data with WDFW and other agencies as needed or upon request. Many of our data reports are available on the web at <http://www.ykfp.org/klickitat/Data.htm>.

Metadata

Metadata is data that describes data or data sets. As of FY 2007, we have begun a push to document all of our data sets with metadata that meets the Federal Geographic Data Committee's Biological Data Profile standard. This is the most highly developed and utilized metadata standard. The metadata will be published on the website <http://www.ykfp.org/klickitat/Data.htm>. The USGS has operating portals with automated harvesting routines that will put our metadata in a searchable database where other researchers will be able to find it with the appropriate search criteria. This will create an avenue by which YKFP Klickitat data may be incorporated into a larger body of knowledge. As more metadata files are developed, we will set up this automated process. Metadata also preserves a history of the collection, storage and manipulation of the data to help it retain its value in the absence of those who originally created it.

Web pages

The publication of web pages presenting our body of knowledge on the Klickitat Subbasin, its fish populations and habitat has long been a goal of the Management, Data and Habitat Project. YKFP Klickitat-based staff have identified and defined much the data and/or information we wish to publish over the public internet, and have decided on a format for presenting it. The Web site is up and running at <http://www.ykfp.org/klickitat> and will continue to evolve. Some pages, such as historic information about the YKFP program, are more or less static—information not intended to be changed substantially.

Some pages, such as the news page, are updated periodically, as new announcements, etc. need to be posted. Some data, such as daily fish counts at the Klickitat Hatchery, are currently updated manually, but will eventually be fed into a form by staff on a daily basis and automatically uploaded to a special form on a web page on the Klickitat site. Annual reports and reports synthesizing data collected over various temporal or spatial units are also available. Raw data is only made available by contacting an identified data gatekeeper, and with the express permission of the YKFP. The process for obtaining raw data will be described in the metadata which is currently under development.

Along with data reports, the web site gives background about the program, shows facilities, shares news and announcements, explains the education and outreach component, and describes the work of the different areas of the YKFP-Klickitat (e.g. RM&E, Data Management, and KWEP). Maps, some of them interactive, show where data is being collected and/or habitat enhancement projects are taking place. Links to partner and funding organizations are also provided, as well as links for contacting YKFP Klickitat staff. The YKFP-Klickitat web site, with the core of essential pages and navigation structure, was launched in September 2007. Functionality is enhanced and updated data are added periodically/regularly.

Summation

In summary, there is an extensive amount of data and technology to be managed within the scope of Klickitat data systems management. The goal of the KDSM is to organize the data into a form that can be efficiently managed and retrieved as knowledge, while keeping the equipment up-to-date and running to support this work. The challenge is to

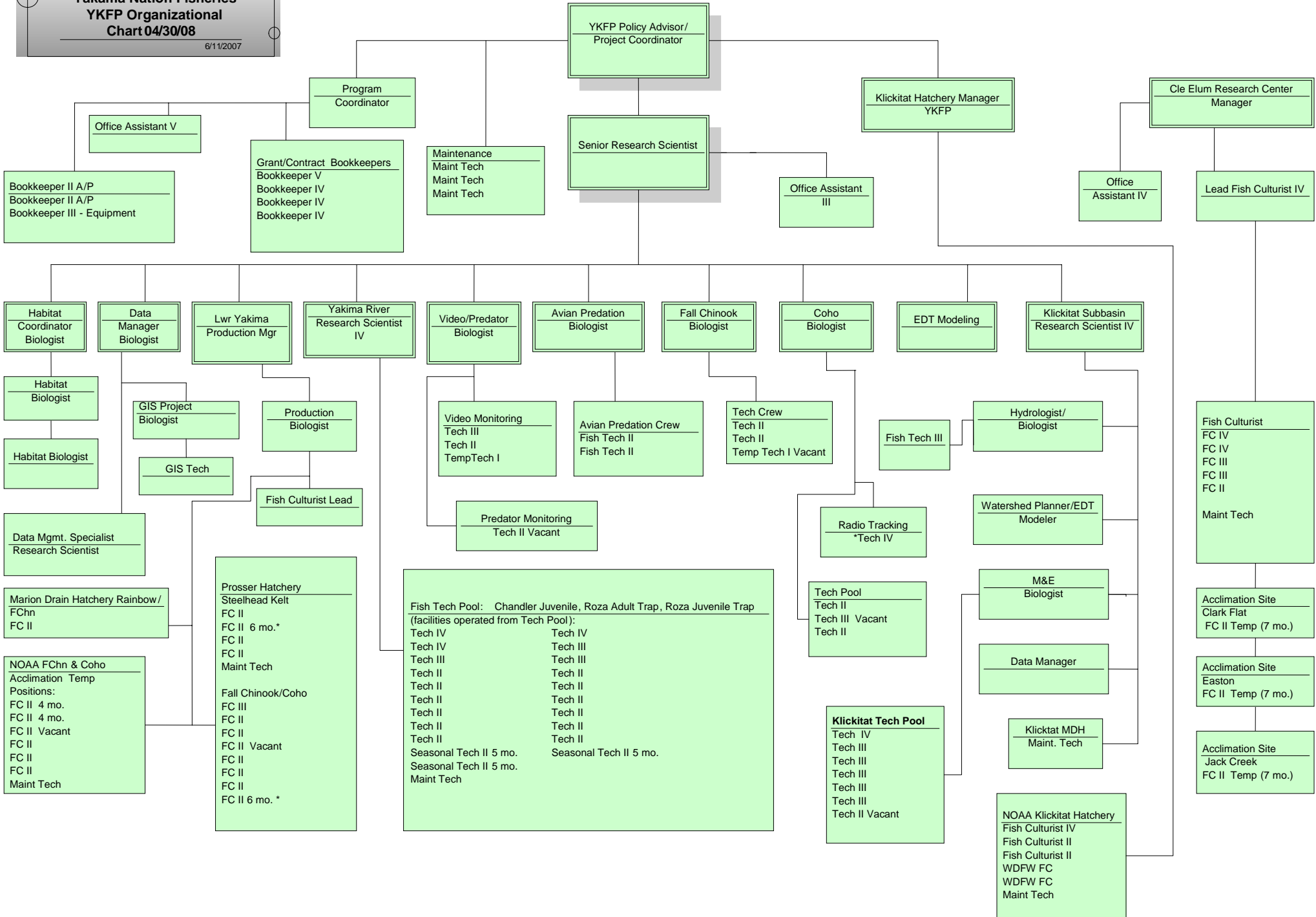
design and develop efficient systems while maintaining the technology to fulfill ongoing data collection, storage, maintenance, and retrieval demands.

Below are the major issues that will continue to be addressed in the evolution of a formal Data Management Plan:

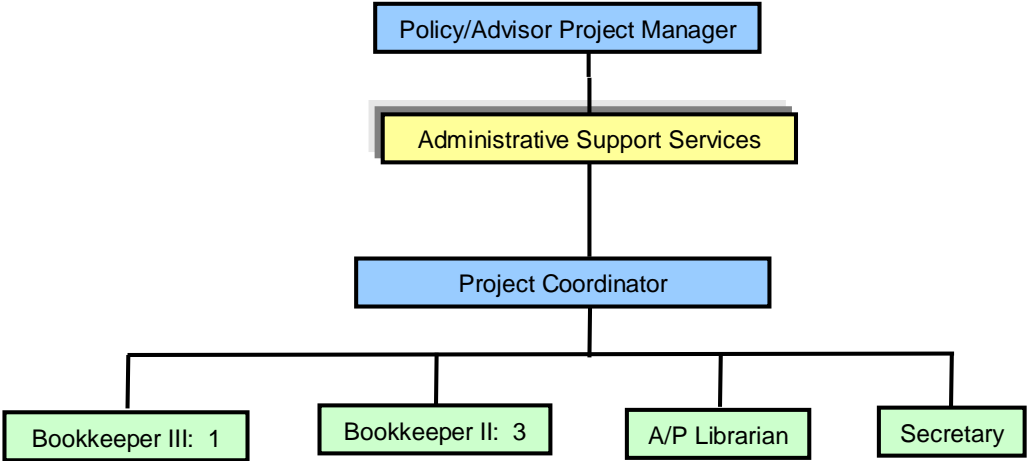
- Identifying and formalizing the objectives for each of the data collection activities carried out by the YKFP within the Klickitat Subbasin. (What questions are we trying to answer? What information are we trying to gain?).
- Identify the end users of this information and define the end user needs.
- Based on end user needs, identify the desired content of standardized reports to allow access to the data or summary statistics as needed.
- Identify what indices are measured and create mechanisms to assure accurate, complete and consistent data collection. There is a real need for written protocols for data collection and storage that include individual and supervisory certification of the completeness and accuracy of data.
- Based on the planned duration and scope of the data collection activity, identify the mode of data storage. For temporary, “one-off” inquiries of short duration where the data set is relatively small, spreadsheets may suffice. For any recurring, long-term data collection efforts, modeling and creating normalized relational database structures for storage of the data provide far superior data utility.
- Design and develop standardized reports for recurring data access needs. With a relational database, customized queries can be used to explore unanticipated questions that may be asked of the data.
- Data input must be standardized and performed as soon after collection as possible.
- Review mechanisms must be developed and followed to verify the quality of existing data and assure the quality of new data as they are collected and stored.
- Remote access for data entry, editing and retrieval are functionalities that will be served by a web presence, given adequate bandwidth.

ATTACHMENT D
YKFP Organizational Chart
May 1, 2007 – April 30, 2008
(Inserted below)

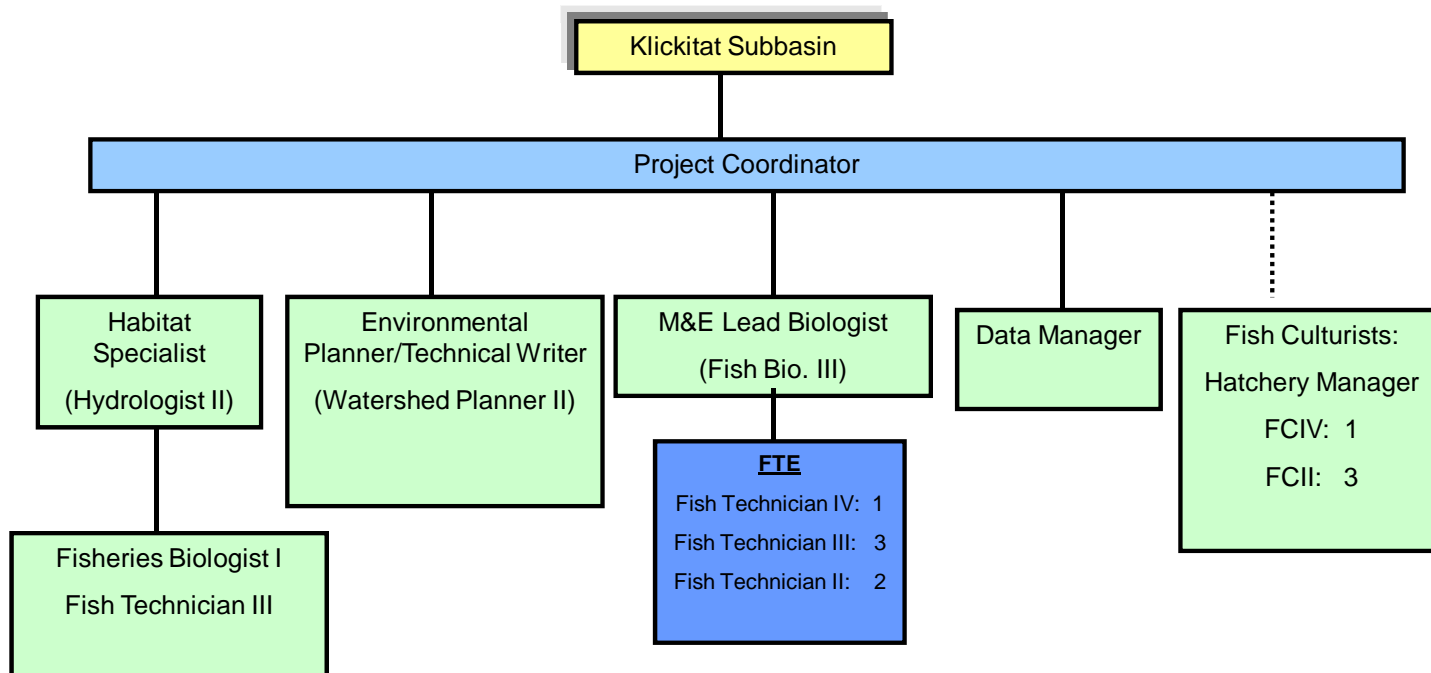
**Yakama Nation Fisheries
YKFP Organizational
Chart 04/30/08**
6/11/2007



YKFP Supervisor-Employee Structure For Administrative Support Services



Footnote: The implementation/compliance are coordinated with Yakama Nation support services which includes Central Accounting, Grants & Contracts, Insurance and Legal Services. Annual audits are conducted through Yakama Nation tribal administration. The YKFP operates under the Yakama Nation Natural Resource Division.



YKFP Supervisor-Employee Structure For the Klickitat Subbasin