Bonneville Power Administration
FY 2003 Provincial Project Review

PART 2. Narrative

Project ID: 35048 (Revised)

Title: Research Monitoring and Evaluation Habitat Data Management Pilot and Federal Habitat Team Project Tracking Pilot.

Section 9 of 10. Project description

a. Abstract

This proposal has two parts:

PART I: Research Monitoring and Evaluation Habitat Data Management Pilot; and,

PART II: Federal Habitat Team Habitat Project Tracking Pilot.

This is a revised Mainstem/Systemwide 35048 proposal.

Part I - Summary

The National Marine Fisheries Service (NMFS) and the US Fish and Wildlife Service (USFWS) completed Federal Columbia River Power System (FCRPS) Biological Opinions in December 2000. The NMFS Opinion has specific research, monitoring and evaluation requirements to support periodic assessments of the adequacy of implementation of reasonable and prudent alternatives (RPAs) in the NMFS Opinion. The Federal Action Agencies have completed an Implementation Plan (IP) for the Opinion. The Plan includes a research, monitoring and evaluation (RME) section relating to RPA's 180 through 198.

In early 2002 the Action Agencies established a research, monitoring and evaluation work group to develop an implementation plan for the RPA Actions 179-199 in the NMFS Opinion, and for the USFWS Opinions. The work group is comprised of a series of technical subgroups with oversight by a technical/policy group. The RME technical working groups include: Status/Effectiveness, Hydro, Hatchery, Estuary/Ocean, Data Management and Regional Coordination.

The Action Agencies will initiate a pilot data collection program this year in the John Day, the Wenatchee and the Upper Salmon that requires data management support. A database program manager, as a part of this proposal will work with the scientific program managers in each basin to develop a pilot database system for use by the subbasin programs and will work with existing database institutions to identify and extract needed data that is already being collected. The needed data from exisiting database programs is considered to be a small percentage of the total data requirement (less than 5% for the John Day). The goal is to develop a single data warehouse for the three subbasins with common data collection and reporting standards. The database program manager will work with subbasin scientific program managers to develop needed quality assurance and quality control QA/QC procedures. The subbasin scientific program managers will be responsible for data entry and for following agreed QA/QC procedures and ensuring and data collection

standards.

An important part of this proposal is the goal of supporting regional coordination amongst the many different groups involved in data collection across the Columbia basin. To this end there is agreement for Part I that the three pilot subbasin projects will adopt standardized methods for reporting data to the data system.

Part II Summary

The Federal Caucus has established a Federal Habitat Team that urgently requires the development and operation of an information system to track Columbia Basin habitat projects relating to salmonid recovery. The Team has prepared a list of the types of data "Metrics" that they wish to collect.

In a separate project the Bonneville Power Administration (BPA) the Bureau of Reclamation, (BRec) and the United States Army Corps of Engineers (USACE) are developing an Implementation Planning MS Access database. The primary goal of this database is to provide required internal tracking of project related data for the FCRPS. A secondary goal of the action agencies at a later time is to add available metrics data from the action agencies to this database. Further goals include the addition of all the metrics data from the action agencies, the addition of metrics data from federal, state and tribal entities outside the action agencies, and the possible migration of all this into an Oracle web and internet enabled environment. At this point the primary goal is being pursued and but no commitment or schedule has been made to a completing the subsequent goals.

The NWFSC Salmon Data Management team has already completed development of a web and GIS ready project racking prototype, on a Oracle platform that can re-host project related data such as that being collected in the IP project. This part II proposal is to proceed with a pilot deployment of the NWFSC prototype: To re-host the action agency data including action agency metrics and to rehost data from other relevant databases.

It is important to understand that the pilot proposal will not replace or duplicate the existing efforts of regional database projects. It may reuse and consolidate existing data, and it will house some data that is currently not being collected.

Longer term Deployment and Funding (Summary):

This part I and II proposal is for pilot level development and pilot deployment (for one year) for some RME data management needs and for Habitat Project Tracking. Currently there are longer term uncertainties for RME (and other projects) in the Columbia - in particular plans for meeting the obligation under the BiOp for a common data management system. Until those plans are developed and implemented there are ongoing needs for interim data solutions. The NWFSC proposal (Parts I and II) provide interim solutions.

From this proposed pilot effort, and other projects such as the CBCIS effort, we expect to be able to further detail/scope the next steps for RME Status Monitoring, Effectiveness monitoring and habitat project data collection. Until the proposed pilot efforts (Part I and II) are completed the actual out-year costs of deployment and redevelopment to meet FCRPS reporting requirements cannot reasonably be detailed. The Until detailed costs can be reasonably estimated it is recommended that a contingency of $500K/yr be established for outyears 04-07.

b. Technical and/or scientific background

PART I Technical/Scientific background

This proposal responds to two components of the RME Plan, Populations and Environment Status Monitoring, and Action Effectiveness Research, that identify the need for pilot scientific data collection and management programs in three subbasins: the John Day (OR), the Wenatchee (WA) and the Upper Salmon (ID).

Populations and Environmental Status Monitoring

The need for status monitoring and corresponding performance standards was identified in the BiOp and specifically called for under RPA Action 180. The objective of status monitoring is to document progress toward the recovery of listed ESUs and condition of their associated habitat. Status monitoring tracks the condition of the populations relative to specified quantitative performance standards specified in the BiOp, or other and key environmental attributes that may be deemed as appropriate. Quantitative standards for environmental conditions are scheduled for development in the first half of 2003 through a Federal Caucus RME workgroup. Information gathered through status monitoring would be used to identify and prioritize areas requiring improvement in management. The data will be essential for recovery planning for ESA listed Salmonids and would useful for NWPPC sub-basin planning efforts. Information about the scientific rationale for pilot status monitoring data collection and general descriptions of needed data are included in the draft RME Plan.

The status monitoring program development requires extensive collaborative work with ongoing research and monitoring programs at planning and data management levels. The ecosystem scale pilot projects will require extensive collaboration with regional data management entities, as well as a wide range of resource management agencies currently doing landscape assessments (e.g., States, USGS, USFS/BLM) and research units developing novel approaches and techniques (e.g., OSU, PNWERC). For the subbasin scale status and trend monitoring pilot projects, the design and testing phase for this project will require collaboration with US Environmental Protection Agency research staff for statistical components of the design, and subbasin planning entities for programmatic components of the design. Implementation of the status and trend monitoring program will require extensive coordination with local co-manager groups in each subbasin. This data management component is designed to maintain data collected and derived from the collaborative efforts of the RME populations and environmental status monitoring program.

Action Effectiveness Research

The objective of action effectiveness research is to establish the cause and effect of actions on fish survival, fish condition, and habitat condition in a quantitatively rigorous approach. This information will be critical for projecting expected benefits of hydro and off-site mitigation actions (collectively habitat, hatchery and harvest actions) at the check-in evaluations. This research requires well-designed experiments, with treatment conditions or areas, controls and adequate replication. Casual monitoring will not meet the objectives of this RME component. Details of the scientific rationale for pilot action effectiveness research (habitat) data collection and general descriptions of needed data are included in the draft RME Plan.

The Action Agencies and NMFS have developed a top-down research plan whose 2003 target is listed spring/summer chinook and steelhead in the John Day, Wenatchee, and Upper Salmon subbasins. The geographic scope is confined because of present uncertainty of the cost and extent of overall monitoring. Because this type of monitoring has never been carried out on this scale, many logistical and project

management problems will need to be solved using the three pilot subbasins. The scope is expected to expand substantially in 2004, to six subbasins, with more subbasins being added in 2005-2008.

Each stream reach will be classified by ecoregion, geomorphic features, valley characteristics, etc. Early in 2003 (before the start of the field season in June[1]) co-managers for the three pilot subbasins will be surveyed to compile a census of past, ongoing, and planned habitat actions – both those funded via the NPPC and other agencies. This survey will also gather information on the results of current biological and habitat monitoring programs. In each year from 2003 to 2008, all ongoing or proposed tributary habitat action sites will be monitored to track changes in local juvenile abundance and environmental conditions. Similar monitoring will occur at paired control sites. The results of ongoing efforts to enumerate redds, tag and enumerate parr and smolts, with expansion and standardization of these efforts as needed, will be compiled into a database of life-stage survival, juvenile and adult abundance, juvenile fish distribution, and environmental conditions for the 25-30 sub-populations of spring/summer chinook and steelhead in the three subbasins. Data will be made available to interested parties within six months of collection (e.g., data collected in 2003 will be available by spring of 2004).

Schedule for Tributary Effectiveness RME Work Group tasks.

Year	Month	Event
2002	December	Start habitat action & biological data inventory
		Top-down approach out for comment
2003	January	Begin CBFWA consultation on monitoring details
		RFP's for extensive habitat surveys out
		Top-down approach comments back
	February	Complete CBFWA consultation
		Top-down approach out as final
	March	Complete habitat action & biological data inventory
		RFP's for extensive habitat surveys back to BPA
		Select contractors for extensive surveys
		Identify gaps in biological monitoring (e.g., no smolt enumeration for sub-populations X, Y, and Z). RFP's for additional monitoring (e.g., smolt traps, spawner surveys, etc.)
	April	Identify treatment and control sites
		Note: this means control sites cannot be chosen based on similarity to treatment sites
		Decide on scope (number of treatment & control sites) for intensive habitat surveys

[1] It is clear that the Action Effectiveness research program has a considerable amount of programmatic work to complete before data needs will be finalized.

	May	Hire & train extensive surveyors
		Let contracts for additional biological monitoring.
	June	Begin field work
	September	Field work complete
	October	Complete compilation of surveys

PART II: Federal Habitat Team - Habitat Project Tracking

Federal Caucus agencies have an obligation to prepare Annual Progress Reports on progress in carrying out recovery actions for Basinwide Salmon Recovery Strategy (All H Paper. The Bonneville Power Administration (BPA) the Bureau of Reclamation, (BRec) and the US Army Corps of Engineers (USACE) are currently developing an Implementation Planning database using Microsoft Access. The primary goal of this database is to provide required internal tracking of project related data for the FCRPS. Further goals include the addition of all the metrics data from the action agencies, the addition of metrics data from federal, state and tribal entities outside the action agencies, and the possible migration of all this into an Oracle web and internet enabled environment. Currently the primary goal is being pursued without commitment or schedule for completion of the subsequent goals.

Given the importance of the related goals to the Habitat Work Group, and in the absence of commitment by the action agencies to proceed, the NWFSC proposes to develop its existing prototype data tracking system as a pilot and to populate the system with data from the IP project and other action agencies.

The information development task is to move from the NWFSC prototype to pilot level development and deployment of the system to consolidate and track the project details and extent of habitat related projects for salmon recovery. A needs assessment is proposed to validate the extent and difficulty of acquiring the needed data and to prioritize the data acquisition effort. A detailed solution will then be developed.

The system will not track the scientific effectiveness of projects (see part I for this). Detailed knowledge of the scope, status and timing of particular projects across the basin is critical to the scientific enterprise, to inform the design of needed sampling and monitoring programs (the RME Status and Effectiveness work groups need this information for their planning). The data will improve decision-making for Salmon recovery by tracking and mapping existing efforts.

Details of the extent of needed data for the Habitat Project Tracking effort is provided in the Table: "FINAL DRAFT 12 February 2003 Habitat Tracking Metrics for Federal Fish Recovery Efforts in the Columbia Basin" below:

FINAL DRAFT 12 February 2003

Habitat Tracking Metrics for Federal Fish Recovery Efforts in the Columbia Basin

	Federal Actions Supporting Habitat Improvements	Examples	Reporting Metric	Cost-share Partners	ESU/ DPU	Subbasin USGS HUC #	Watershed USGS HUC #	GPS Coordinat
Planning								
	Recovery Plans	NOAA Fisheries/USFWS Recovery Plans	Plans underway, Number completed, Percent completed					
	Subbasin Plans and Assessments	NPPC Subbasin Plans, USFS/BLM Subbasin Plans	Plans underway, Number completed, Percent completed					
	Watershed Plans and Assessments	Identify actions to achieve Subbasin Plan goals	Plans underway, Number completed, Percent completed					
	Other Plans and Assessments	Basinwide Salmon Recovery Strategy, FCRPS BiOp, Federal LRMP/RMP Aquatic Conservation Strategy, NFMA, NEPA, RM&E	Plans underway, Number completed, Percent completed					
Strategies/ Programs/ Initiatives								
	Improve Water Quantity	Implement programs improving transactional approaches, FERC Licensing, Complete subbasin/watershed fish-flow assessment programs	Number underway, Percent completed					

	Federal Actions Supporting Habitat Improvements	Examples	Reporting Metric	Cost-share Partners	ESU/ DPU	Subbasin USGS HUC #	Watershed USGS HUC #	GPS Coordinat
	Improve Water Quality	Participate with states/tribes in TMDL development and implementation, and coordinate with EPA / State 319 nonpoint source projects. Water quality management plans implemented (states); COE Regional Sediment Management plans, COE Section 1135 and 206 Ecosystem Restoration programs	Number underway, Number developed, Number approved, Percent completed					
	Improve Passage Diversions	FS Region 6 culvert removal, prioritization strategy. OR, ID, WA Fish Screening programs, COE Section 1135 and 206 Ecosystem Restoration programs	Number culvert removal, prioritization strategies underway, Number completed					
	Improve Watershed Health	Implementation of salmon beneficial components of the National Fire Plan, Healthy Forest Initiative, COE Section 536 Columbia River Estuary Ecosystem Restoration Program	Number of salmon beneficial program components developed, Number completed					

	Federal Actions Supporting Habitat Improvements (**Bold** actions indicate core measurable habitat actions derived from FCRPS BiOp Tier 3 effectiveness monitoring categories)[1]	Primary Benefit	Reporting Metrics (per action)	Cost-share Partners	ESU/ DPU	Subbasin USGS HUC #	Watershed USGS HUC #	GPS Coordinates
Actions								
1. Instream-structural								
	Improve stream structure/reconfigure stream morphology	Stream complexity restoration	Number of stream miles treated (to 0.1 miles)					
2. Instream-passage								
	Upgrade or eliminate culverts	Barrier removal	Number of miles habitat accessed/action (to 0.1 miles)					
	Eliminate barriers (remove diversions, dams, mine tailings, low water crossings, install fish ladders)	Barrier removal	Number of miles access (to 0.1 miles)					
3. Fish screens								
	Install/retrofit fish screens to NMFS/USFWS standards	Screen irrigation diversions	Size of each diversion screened including rate (cfs) and duty (quantity)					
4. Riparian conservation								
	Riparian habitat improvement/restoration treatments	Riparian function restoration	Riparian miles (to 0.1 miles) and acres treated, thinned, fenced each side of stream					

	Federal Actions Supporting Habitat Improvements (**Bold** actions indicate core measurable habitat actions derived from FCRPS BiOp Tier 3 effectiveness monitoring categories)[1]	Primary Benefit	Reporting Metrics (per action)	Cost-share Partners	ESU/ DPU	Subbasin USGS HUC #	Watershed USGS HUC #	GPS Coordinates
	Secure long-term riparian protection/conservation easements	Riparian function restoration	Number of stream miles (to 0.1 miles) and total acres each side of stream					
	Acquire productive fish habitat	Riparian function restoration	Number of miles (to 0.1 miles) and acres/action					
	Streambank stabilization treatments	Riparian function restoration	Number of miles (to 0.1 miles)					
5. Water quantity								
	Lease or purchase instream flows (wet water)	Instream flow restoration	Amount of water (cfs), stream reach improvement (miles), timing (season) of effect; miles meeting ESA needs					
	Water measurement	Assess flows and consumptive use	Number of gauging or demand measurement devices installed, stream reach measured (miles), amount of water (cfs)					
	Water conservation projects, Special use permits (actual water conserved through modified irrigation application, delivery, change in point of diversion, well, etc) *	Instream flow restoration	Amount of water returned to instream use (cfs), stream reach (miles) affected, timing (season) of effect; miles meeting ESA flow needs					
	Water right adjudication	Identify water resource	Percent of rights adjudicated					

	Federal Actions Supporting Habitat Improvements (**Bold** actions indicate core measurable habitat actions derived from FCRPS BiOp Tier 3 effectiveness monitoring categories)[1]	Primary Benefit	Reporting Metrics (per action)	Cost-share Partners	ESU/ DPU	Subbasin USGS HUC #	Watershed USGS HUC #	GPS Coordinates
		allocations, risk						
6. Water Quality								
	Tributary and Mainstem Wetlands restored/created	Water quality improvement	Number of acres					
	Apply EPA BMPs, federal Standards and Guidelines, to agricultural areas, sivicultural activities, abandoned mine sites, construction sites, and from dams and other hydrologic modifications that generate nonpoint source pollutants	Water quality improvement	Number and size (acres) where BMPs, S&Gs applied; detected water quality improvements; Reaches removed from 303(d) list.					
	TMDL implementation	Water quality improvement	Miles improved, Number and Percent of reaches removed from 303(d) list					
7. Roads								
	Improve roads hydrologically connected to streams	Sediment reduction	Miles of road decommissioned or upgraded					
	Decommission roads hydrologically connected to streams	Sediment reduction	Miles of road decommissioned or upgraded					
8. Estuary								
	Protection/acquisition	Protect habitat	Number of acres wetlands and key habitats protected					
	Restoration	Riparian function	Number of acres wetlands and key					

	Federal Actions Supporting Habitat Improvements (**Bold** actions indicate core measurable habitat actions derived from FCRPS BiOp Tier 3 effectiveness monitoring categories)[1]	Primary Benefit	Reporting Metrics (per action)	Cost-share Partners	ESU/ DPU	Subbasin USGS HUC #	Watershed USGS HUC #	GPS Coordinates
		restoration	habitats restored					
	Passage	Barrier removal	Number of acres/miles habitats opened					
	Predator treatments	Reduce mortality by altering predator abundance/distribution	Number of actions completed					
9. Upland risk reduction								
	Planting	Reduce sedimentation, improve water quality, improve annual hydrologic runoff cycle	Acres treated					
	Erosion control	Reduce sedimentation, improve water quality	Number of acres treated					
	Stand management	Reduce sedimentation,	Number of acres treated					

	Federal Actions Supporting Habitat Improvements (**Bold** actions indicate core measurable habitat actions derived from FCRPS BiOp Tier 3 effectiveness monitoring categories)[1]	**Primary Benefit**	**Reporting Metrics (per action)**	**Cost-share Partners**	**ESU/ DPU**	**Subbasin** USGS HUC #	**Watershed** USGS HUC #	GPS Coordinates
		improve water quality, improve annual hydrologic runoff cycle						
	Alternate livestock water supply development	Reduce risk to streams and fish by keeping livestock out	Number of actions completed					
	Slope stabilization	Reduce risk to streams and fish by reducing sediment	Number of acres treated					
10. Research, Monitoring and Evaluation								
	Population status monitoring, environmental status monitoring, effectiveness monitoring, database monitoring, and compliance monitoring as it relates to habitat	Provide information to judge satisfaction of performance standards and ecosystem based benefits from	Miles of stream inventory/monitoring/ 5th field watershed; Resources obligated; Summarize results of implementation and effectiveness monitoring					

	Federal Actions Supporting Habitat Improvements (**Bold** actions indicate core measurable habitat actions derived from FCRPS BiOp Tier 3 effectiveness monitoring categories)[1]	Primary Benefit	Reporting Metrics (per action)	Cost-share Partners	ESU/ DPU	Subbasin USGS HUC #	Watershed USGS HUC #	GPS Coordinates
		habitat actions						

[1] These are core measurable habitat actions derived from categories currently proposed for Tier 3 Effectiveness monitoring under the Comprehensive Research, Monitoring and Evaluation Program called for under the 2000 FCRPS Biological Opinion. These categories are 1) screen irrigation diversions, 2) barrier removal, 3) sediment reduction, 4) water quality improvement, 5) nutrient enhancement, 6) restoration of instream flows, 7) restoration of riparian function, and 8) stream complexity restoration. Nutrient enhancement (#5) is included in this table under Research Monitoring and Evaluation.

c. Rationale and significance to Regional Programs

PART I AND II.

Rationale

The parts of this proposal respond to the FCRPS RME program and are intended to provide information needed for assessment of Endangered Species Act (ESA) listed Columbia Basin salmon and steelhead populations at the 2005 and 2008 year NMFS BiOp check-in evaluations and to inform specific RME data collection efforts. A data process schema showing the relationship between Parts I and II and RME work group efforts is shown below.

Regional Coordination

Currently there is a broad patchwork of regional RME efforts in different phases of planning, development, and implementation that could benefit from increased coordination. The NMFS FCRPS BIOP, the Federal All-H Strategy and the NWPPC Fish and Wildlife Program all call for RME programs. Currently a Federal Habitat Team, directed by the Federal Caucus is proposing to develop a database to track all projects that impact habitat across the Columbia Basin. The Team has identified raw data needs and is beginning to involve database developers and designers.

In addition, federal programs such as the Forest Service and Bureau of Land Management's Northwest Forest Plan and Pacfish/Infish Biological Opinions and EPA's EMAP program include useful RME data. At the state level, both Washington and Oregon have formulated their own plans for monitoring freshwater habitat conditions. There also are collective efforts such as the Lower Columbia River Estuary Program (LCREP), a joint program involving agencies from Washington and Oregon, federal agencies and local jurisdictions. These monitoring programs overlap one another at various spatial and temporal scales (see "Regional RME Needs –Cross Coverage" below).

The RME pilot data management effort anticipates the need for access to data from many of these existing data programs and the need for coordination.

Regional coordination issues related to data are:

- Coordination of RME research methods, data collection and reporting protocols. If timing permits there may be opportunity for the pilot efforts to benefit from regional information system development initiatives arising from the CBCIS (Columbia Basin Cooperative Information System) effort.

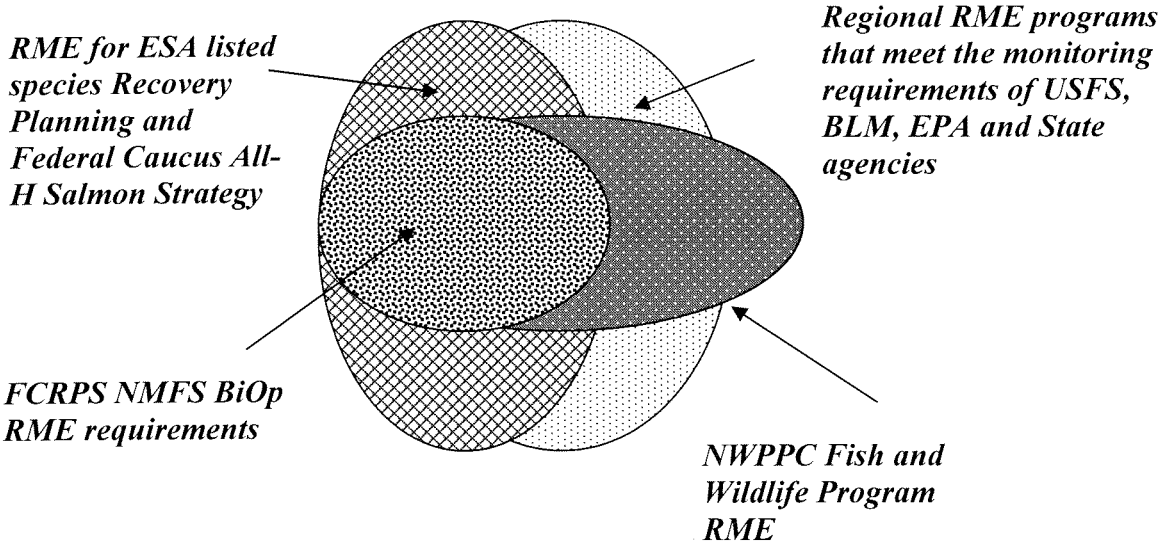
- The implementation of status monitoring and action effectiveness research pilot studies in the John Day, Wenatchee, and Upper Salmon. Key objectives of these

pilot projects include working with regional entities at the implementation level to identify how best to consolidate data and coordinate with other RME programs and objectives.

- The need for (at least) the federal partners in the RME IP effort (note the RME IP is not the same as the planned Action Agency IP project tracking effort) to have access to a consolidated source of RME data.

A Federal Caucus RME workgroup has recently been formed through the Federal Caucus to provide regional coordination and points of interface between the NMFS BiOp required RME program and other Federal RME programs, and insure that the Federal Caucus meets the RME requirements identified under the All-H Salmon Strategy. It has proposed a series of meetings at different levels with Federal State and tribal Interests.

Regional RME needs - Cross Coverage:



d. Relationships to other projects

There are a number of important, yet distinct, regional information projects relating to this proposal. While these projects have not been designed to meet specific RME data needs, some data from many of these projects is needed for the FCRPS RME Plan. This NWFSC pilot proposal will not replace or duplicate the existing efforts of regional database projects. It may reuse and consolidate existing data, and it will house some data that is currently not being collected.

The most significant existing regional data management development projects in the Columbia basin include the following:

- The Columbia Basin Cooperative Information System (CBCIS) project, which is aimed at identifying regional needs for information system development for the Columbia Basin (of which RME is considered a highly relevant subset). The CBCIS initiative results from a memorandum of agreement between the NWPPC and the NMFS. The NWPPC has employed a contractor, Science Applications International Corporation (SAIC) to identify regional needs. A report is expected from SAIC in March 2003.

- The Regional Ecosystem Office (REO) effort, an interagency support effort to develop and manage regional data sets, for example 5th and 6th HUC watershed delineation data and 1:24,000 forest and watershed data.

- Data Access in Real Time (DART). DART provides access to current and historic information from sources such as StreamNet, the Fish Passage Center, and others. As such it is considered a "second tier" database. DART uses a report generator to allow users to select one or more routinely prepared documents, graphs, etc., for viewing and printing.

- The Fish Passage Center (FPC). The Center provides specific analysis of alternatives for fish passage, such as those used for decisions on flow augmentation, spill, adult passage and the like. It provides analysis and reports to state water quality agencies. The FPC designs and oversees the Smolt Monitoring Program and manages the Comparative Survival Study.

- StreamNet is the Northwest Aquatic Resource Information Network. StreamNet operates a database containing fully referenced data and an on-line query interface. It maintains a library and reference system for use in monitoring and evaluation of Columbia basin fish stocks. StreamNet prepares an annual report on status of runs including some data on environmental conditions that could affect status.

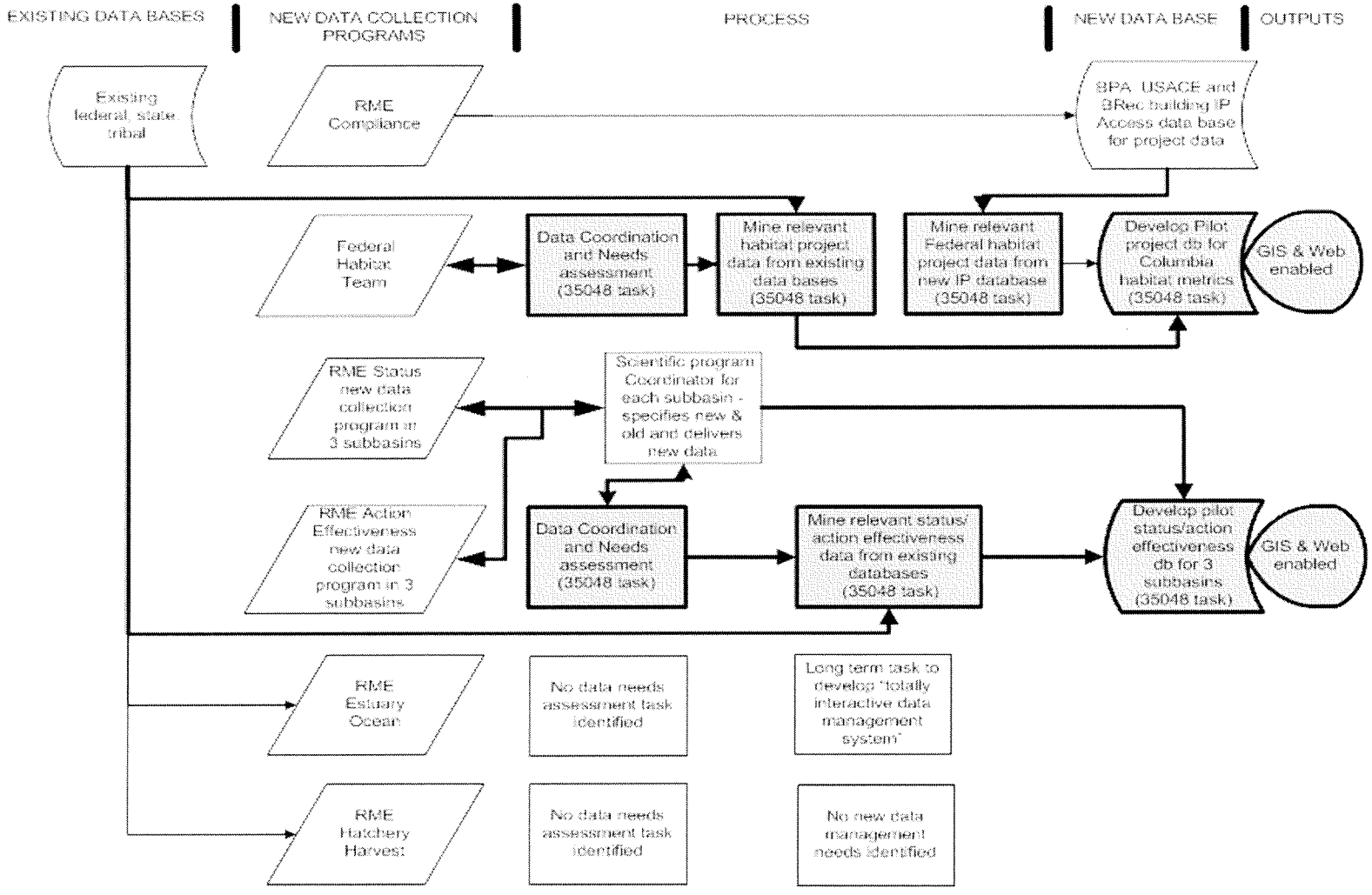
- PIT Tag Information System (PTAGIS) is a program to provide database systems management and operations for the collection and distribution of PIT (Passive Integrated Transponder) data to all interested parties. It operates transponders on hydroelectric dams on the Columbia and Snake rivers and provides user training and support.

- The Coded Wire Tag Recovery (CWT) and Regional Mark Information System (RMIS). The CWT program provides for a joint Washington and Oregon sampling effort for coded wire tags while the RMIS provides for the recovery and management of data from the tags through the Pacific States Marine Fisheries Commission Regional Mark Information System.

- Federal Habitat Team project tracking effort. This effort is designed to report project level information about planning, strategies/programs/initiatives, and

actions taken to support habitat improvements in the Columbia Basin.

DATA PROCESS SCHEMA- 35048 Proposals in Relation to RME Data Management



e. Project history (for ongoing projects)

Not Applicable

f. Proposal objectives, tasks and methods

Objectives (for Parts I and II)

Objectives- Overall for RME Plan: Develop a common system for the efficient and effective collection, management and distribution of information relating to RME needs as specified in 2000 FCRPS Biological Opinion for action items 179-199. Ensure that the system will be compatible with available fish and wildlife data management requirements for the Columbia River Basin. Participate in the incorporation of FCRPS RME data into a regional data management system when it is developed.

Objectives – Specific for Part I: In cooperation with local, state, tribal and federal parties develop a data management pilot system for research, monitoring and evaluation data management in three subbasins: the John Day, Wenatchee and Upper Salmon.

- Recognize the need to develop an information system(s) from the ground up in a modular fashion so that the system(s) meets the practical needs of users while meeting the legal and administrative requirements of the region.
- Perform a scoping exercise. Develop specific data collection needs for the pilot.
- Identify and use common protocols and techniques for data collection, development, storage and distribution where possible.
- Ensure that data can be shared, as needed, for timely analysis.
- Ensure properly documented metadata for published data and information. Include data pedigree and metadata and clearly distinguish primary data and derived information.
- Adopt geo-spatially reference standards using repeatable standard methods. Where possible make the data available as spatial data layers.
- Provide security for data, systems and participant information where necessary.
- Work collaboratively and cooperatively with existing data collection and management entities to obtain necessary data, share data and improve data quality.

Objectives – Specific for this RME IP Pilot Program Part II: Develop a pilot Federal Habitat Team - Habitat Tracking Pilot Database. Provide for the tracking of action

agency (and at a further stage state and tribal) projects within a common web and GIS enabled repository.

Objectives of project sponsor - NWFSC Salmon Data Management (SDM) Program:

For NWFSC scientists and external customers:

- Promote collaboration, communication, and coordination using e-gov principles and enterprise-wide architecture framework to share and access internal and external information and data;
- Provide and maintain corporate data, metadata and applications;
- Support analysis and project management services; and,
- Respond in a timely manner.

The SDM Development Strategy is:

- Apply a Rapid Application Development (RAD) approach to solving information system development problems. Bottom up and top down;
- Leverage currently available systems, applications and data where possible;
- Adopt Standards and Best Practice Guidelines;
- Implement CIO Enterprise Architecture, FGDC Metadata, 508 Accessibility, NOAA web site development, Oracle Information CASE methodology and other NMFS standards and policies; and
- Leverage partnership and joint funding opportunities.

Tasks

PART I: Pilot Habitat Monitoring (3 subbasins):

Tasks - Background

To guide the overall decision-making process the RME Data Management Team solicited input from regional experts with experience in developing or managing large-scale regional information systems. The strategic findings of the group were as follows:

- A key discussion concentrated on how to meet the FCRPS Opinion needs in the short term and how to do this efficiently and in a way that allows integration and compatibility of the information with other regional data management efforts[2].

- In particular an interim repository is needed for the upcoming field season. The group agreed to pursue pilots.

- A key point was not to focus or decide on technology/database solutions until after the specific needs, data outputs, and data inputs of the planned user group have been defined in a detailed needs assessment with the creation of a data dictionary.

- Data analysts should complete the data dictionary/needs assessment from the actual data needs defined by the data users.

- Following the creation of a pilot data dictionary for three pilot basins, the Team would evaluate the specific data management needs and determine if existing data management systems are adequate. If not, a more formal system analysis would have to be done to make decisions about how best to meet those needs through: 1) augmentation of existing management systems; 2) the establishment of a new centralized data management systems; or 3) the creation of a distributive system of subbasin databases and portal efforts. Emphasis was made on the benefits of achieving the results in an iterative and modular fashion rather than through a large-scale development that might solve all problems at one time but at the risk of not meeting critical time and user needs.

- The hydrological foundation for the RME effort will be the 1:24,000 GIS enabled data from the USFS/BLM/STATE hydrographic effort where it is available[3]. This process involves the use of a shared data set based on common standards. It supports the mounting of field data on a common server for widespread use, a function that is similar to that needed for RME.

- Finally there was discussion about how the RME data collection effort relates to the Columbia River Basin Cooperative Information System (CBCIS) initiative. The purpose of the CBCIS project is to develop regional agreement on information system standards and protocols, and determine if an overall information system architecture or design would best serve the Basin. Currently a consultant group, Science Applications International Corporation (SAIC) is completing a high-level needs assessment in the Basin. While the RME data is considered a subset of the overall regional data, it is unlikely at this time that the results of the SAIC needs assessment will be completed or acted on in time to provide for the needed RME data collection. Meanwhile the RME Team will

[2] Integration is a substantial effort that is beyond the scope of these pilot efforts, which aims to reuse and consolidate particular data sets.

[3] In reality 1:24,000 COVERAGE is not available and/or has not been validated for the entire Columbia, which means reliance, in some locations, on 1:100,000 data.

implement an interim plan to meet the obligations under the FCRPS Opinion requirements and where possible coordinate its plan with the CBCIS effort.

Tasks – Part I Summary Objectives, Tasks and Estimated Costs:

Table: Summary of PART I Pilot Subbasin Habitat Project			
Strategy	Objective	Task	Estimated Schedule[4]/Costs[5]
Habitat Pilots for three sub basins	1. Scoping pilot data management project and project management	1. Fully scope data resources. Prioritize needs and develop detailed project plan. Manage project.	Data analyst, 2 months, $15K. Project Management (except deployment), 12 months at 0.25 FTE, $25K. All project travel $15K.
	2. Pilot data management needs assessment.	1. Validate data needs outputs and model inputs. 2. Identify data protocols, needed spatial data layers, QA/QC methods, etc. Identify standard data reporting protocols for the three subbasins. 3. Review needed data for compatibility. 4. Develop initial data dictionary for needed data. 5. Identify initial business rules for operating pilot information system.	Data Analysts, 3 months, $30K.
Total Planning and Design phase			**$85K**
	3. Go-NoGo decision	Client to review and make decision	
	4. Develop pilot information management system.	1. Confirm needs. 2. Design and develop information	Web Developer, 6 months, $55K. Database Developer, 6

[4] The schedule is based on the "Schedule for Tributary Effectiveness" which states that compilation of survey information will occur in October 03. This proposal assumes that the Population and Status Monitoring group adopts a parallel schedule for the purpose of database development.

[5] The estimates provided here are based on best professional judgment based on experience of what database consolidation and web/GIS development /deployment of this scale typically costs.

		management solution. 3. Build, test and document the pilot system.	months $60K. Documenter, 2 month, $12K. Tester, 3 month, $18K.
Total Development (Construction and Development)			**$145K**
	5. Pilot Deployment (for 1 year)	1. Provide user training. 2. Populate the data system with available data. 3. Maintain pilot database and access and perform backups and database maintenance.	Deployment project management 0.1 FTE/yr, $9K. Data Specialists-Application Administrator, 1.0 FTE/yr, $70K, Data Base Administrator, 0.2 FTE, $20K. Trainer, 1month $6K.
Total Deployment (Operation and Maintenance cost for 1 yr)			**$105K**
	6. Monitor and Evaluate	1.Independent Validation and Verification.	Senior analyst, 1 month $15K.
Total Monitoring and Evaluation			**$15K**

Methods: Part I

Methods - General: For the RME Pilot subbasin task the SDM Team will apply a Rapid Application Development[6] methodology (outlined below) which is an established stair step, iterative decision-making process for information system development.

Stage I - Assessment. Understanding the data, the amount of work involved in developing the application and the data migration.

Stage I – Pilot/Preliminary Strategy/Analysis/Design. Pilot GO/NO GO Decision.

Stage I - Pilot creation/development, testing and documentation.

Stage I - Pilot deployment

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Stage II –Detailed Project plan[7]

[6] Legg, Dai and Barker, Richard, 1994. Case Method Fast-Track - A RAD Approach. Addison –Wesley Publishing Company.

[7] NOTE: This proposal does not include funding for a full-blown Stage II or III deployment below. In this case, because the RME program and the habitat project tracking effort are new, it is likely that changes will be necessary to scope, scale and effort after real world pilot level deployment experience. This is a normal part of RAD information system development where the risks are minimized by developing pilots and testing them in the real world and then redeveloping and redeploying. It reduces risk of developing systems that fail to meet user needs and it anticipates that

Stage II - Strategy, Analysis, Design

Stage II - Development/Documentation/Testing

Stage III - Transition/ Training

Stage III - Deployment

Stage III - Maintenance

Stage III - Independent Validation and Verification

Methods - specific:

Stage I – Detailed Awareness/Assessment.

The majority of data needs (estimated to be 90% for the John Day[8]) for the 3 subbasin pilot Environmental Status monitoring and Action Effectiveness habitat projects is considered to be new and therefore to require either a new data collection program or be from data sources that have not previously been accessed, for example satellite data. A small component of needed data is expected to come from existing regional databases. Therefore the core tasks are to develop a new database system, together with data entry mechanisms for new data collection and to consolidate this data with some existing data from regional databases. The task involves developing and describing a detailed understanding of both new and existing data system resources.

The awareness assessment steps for the pilot project are identified as follows:

1. The RME Plan sections *Populations and Environmental Status Monitoring and Action Effectiveness Research* sections identify scientific questions that need to be informed by data.

2. Using the RME Plan and contact with key individuals (especially the authors of the RME Plan), create a list of the scientific questions and the data name, duration and quality of named data needed to answer each question. Identify the access needs of users. Identify needed data formats. How often is the data needed? What specific reports are required?

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user needs will change in part which is entirely realistic. Following interim deployment then, decisions on longer-term deployment will need to be made by the clients.

[8] Communication from Michael Newsom (BORec), Steve Katz (NMFS) and Chris Jordan (NMFS) 2-20-03.

3. Since the same data may be used to answer more than one question reconcile the needs into a master list of needed data.

4. For each needed data element identify whether the data is already being collected and available within an existing database, whether the collection of the data is part of a planned collection program (name the program and contact information), whether the data does not exist, or exists but is not being collected, or whether the data exists but is not available. Create a master list of needed data elements and status.

5. For all needed data on the master list identify and define at least the following data element definitions. For example: details for each data element including: the data element name, the data description, a field name, the data collection standard (if any applies), the code format or data type, whether on not a null value is allowed, what if any default value applies, whether the data is original field data or derived data, any other relevant metadata and any business or operational rules that apply to the data.

6. With respect to existing data repositories it is necessary to determine and describe how the data is stored (in what type of storage system), how much data is stored, what quality assurance and quality control procedures apply to the data, whether metadata is available, the procedure for acquiring the data, the frequency of data update, the actual source including contact information, and the formats available for data transfer. Wherever possible, copies of existing data dictionary information, database user guides and system entity relationship diagrams should be obtained and made available as a part of this project documentation. If plans for changes to existing databases to provide for data needed in the pilot RME programs are finalized, these plans should also be collected.

7. Develop an initial data dictionary for the pilot RME data project. The data dictionary/needs assessment information will be developed for a standard CASE (Computer Assisted Systems Engineering) methodology.

8. Identify any business rules that apply to the management or use of the needed data.

Stage I - Preliminary Strategy/Analysis Design.

While design decisions cannot be made until after the needs assessment the central task of this proposal is to build a web and GIS enabled repository for a mostly new data collection program and to re-host selected related data sets from existing repositories.

Since monitoring and evaluation decisions must be made on the statistical analysis of available data it is imperative that not only is the available data sound, with credible QA/QC data, but that it is also maintained in a structured and stable environment. This is

important from both scientific and legal viewpoints because it is necessary for decision making agencies to be able to show the entire record of their decision making and track all data and versions of documents. QA/QC must be directly addressed at source of data.

Stage I Pilot testing.

Testing protocols and scripts should be developed as a part of the needs assessment while the design should anticipate meeting these testing protocols and scripts which must be based on actual data needs.

Stage I - GO/NO GO

It is important to understand the role of a GO/NO GO decision in the RAD process. A go decision is supported when the development team identifies the range of alternatives and the user group selects the solution meets their defined needs. The development team needs to be ready to discuss alternative choices for components of the preferred solution with the clients so that the clients are informed about the options and the consequences of selecting different alternatives. For example, alternatives concerning QA/QC.

Following pilot development and use it will be necessary to make a longer term GO/NO GO decision concerning the ongoing management of RME data, either within the Federal agencies or through an alternative.

Program Review (or Independent Validation and Verification)

Program review and evaluation in information system development is termed independent validation and verification (IV&V). For this pilot proposal the IV&V will be completed at the end of the one-year operational period. The purpose of the IV&V is to provide the development team with feedback on system deficiencies and areas where improvements can be made.

Programmatic performance indicators for data management programs will also be used:

1) Were the defined user needs as specified in the design documentation?
2) Was on time delivery achieved based on the project plan?
3) Was on budget delivery achieved based on the project plan?
4) Does the effort satisfy the Independent Validation and Verification (IV&V) requirements?

The Columbia Basin, as a region, has not adopted regional standards that could guide this proposal, for example, for completing metadata, for data collection methods, for GIS spatial data standards, or for compliance monitoring with a common data-dictionary. In the absence of existing regional standards the developers of this pilot will need to adopt standards that best fit the needs of the users and accommodate regional standardization if it should occur.

The Columbia Basin Cooperative Information System (CBCIS) project is addressing the need for standards, and, if there is support for such a regional approach, then development of regional standards/protocols are likely to be amongst the most important priorities. Depending on the timing these may benefit RME data management.

Tasks

PART II: Pilot Habitat Project Tracking

Tasks - Background

Currently there is no Columbia basin system for tracking all projects that affect habitat. It is needed by the Federal Habitat Caucus to track the investment of resources on salmon recovery and to measure the scope and scale of the habitat recovery investments on salmonid populations. Relevant data for a region wide habitat tracking system is currently located in many different documents databases and sources and is being generated by many different programs. Internal project tracking systems, currently being developed by the action agencies in an Implementation Planning project will contain some relevant information for the Habitat Project Tracking task

Habitat tracking information is important for many different users. For example planners of scientific monitoring projects need to know, for a given geographical area, what the existing or proposed recovery projects are. This knowledge allows planners to decide where samples can be taken and what duration of sampling is needed to assess the effectiveness of given projects. This means that information, at different levels of detail, about all projects, is needed. Currently this information is extremely difficult to obtain and the effort is labor intensive. A researcher, currently working at the Northwest Fisheries Science Center, has spent 3-4 months to evaluate project information from existing databases for three selected subbasins in the Columbia Basin. This proposal will benefit from that research, however considerably more effort is needed.

Tasks – Part II Summary Objectives, Tasks and Estimated Costs:

Table: Summary of PART II – Pilot Habitat Project Tracking			
Strategy	Objective	Task	Estimated Schedule[9]/Costs[10]
Compliance Monitoring System	1. Scoping Habitat Project Tracking Metrics.	1. Fully scope existing Habitat Project Tracking Metrics and available databases. Prioritize needs and develop a detailed pilot project plan.	Data analyst, 2 months, $15K. All Project management (except deployment), 10 months at 0.25 FTE, $20K. All Travel $10K.
	2. Habitat Project Tracking detailed needs assessment.	1. Identify data needs, outputs, and model inputs. 2. Identify data protocols, needed spatial data layers, QA/QC methods, etc. 3. Review needed data for compatibility. 4. Develop initial data dictionary for needed data. 5. Identify business rules for operating pilot information system.	Data Analyst 3 months, $30K.
Total Planning and Design Phase			**$75K**
	3. Go-NoGo decision	Client to review and make decision	
	4. Develop pilot information management system.	1. Design and develop information management solution. 2. Build, test and document the pilot system.	Web Developer, 3 months, $27K. Database Developer, 3 months $30K. Documenter, 2 month, $12K. Tester, 2 month, $18K.
Total Development (Construction and Development)			**$87K**
	5. Pilot Deployment (for one year)	1. Provide user training.	Project management, 1 yr @ 0.1 FTE, $10K.

[10] The estimates provided here are based on best professional judgment based on experience of what database consolidation and web/GIS development /deployment of this scale typically costs.

		2. Populate the data system with available data. 3. Maintain pilot database and access and perform backups and database maintenance.	Data Specialists-Application Administrator 0.5 FTE, $35K, Data Base Administrator 0.2 FTE, $20K. Trainer, 1month $6K.
Total Deployment (one year)			**$71K**
	6. Monitor an Evaluate	1. Independent Validation and Verification	Senior analyst, 1 month, $15K.
Total Monitoring and Evaluation			**$15K**

METHODS

Methods - General: For the RME Pilot subbasin task the SDM Team will apply a Rapid Application Development[11] methodology (outlined below) which is an established stair step, iterative decision-making process for information system development.

Stage I - Assessment. Understanding the data, the amount of work involved in developing the application and the data migration

Stage I – Pilot/Preliminary Strategy/Analysis Design. Pilot GO/NO GO Decision.

Stage I - Pilot creation/development and pilot testing

Stage I - Pilot deployment

Stage II –Detailed Project plan[12]
Stage II - Strategy, Analysis, Design

Stage II - Development/Documentation/Testing

Stage III - Transition/ Training

Stage III - Deployment

Stage III - Maintenance

[11] Legg, Dai and Barker, Richard, 1994. Case Method Fast-Track - A RAD Approach. Addison –Wesley Publishing Company.
[12] See footnote 7 above

Stage III - Independent Validation and Verification

Methods - specific:

Stage I – Detailed Awareness/Assessment.

This task involves developing a detailed understanding of all the data sources with relevant information concerning federal actions for salmon habitat recovery.

This task assumes:

- Quality assurance and quality control (QA/QC) will be performed on the raw data by the individuals and agencies entering data.

The needs assessment steps for the pilot Habitat Project Tracking are identified as follows:

1. Contact key individuals who will use data to determine what specific data element they need and any information they have about sources of that data. Identify the access needs of users of the needed data. What data formats are needed? What specific reports are required? How frequently is the data needed?

2. For each needed data element (attribute) identify: whether the data is already being collected and available within an existing database; whether the collection of the data is part of a planned collection program (name the program and contact information); whether the data does not exist; or whether the data exists but is not available. Create a master list of needed data elements and status

3. For all needed data on the master list identify and define at least the following data element definitions. Details for each data element including: The data element name, the data description, a field name, the data collection standard (if any applies), the code format or data type, whether on not a null value is allowed, what if any default value applies, whether the data is original field data or derived data, any other relevant metadata and any business or operational rules that apply to the data.

4. With respect to existing data repositories (and potentially other data sources such as written plans and documents) it is necessary to determine and describe how the data is stored (in what type of storage system), how much data is stored, what quality assurance and quality control procedures apply to the data, whether any metadata is available, the procedure for acquiring the data, the frequency of data update the actual source including contact information and the formats available for data transfer. Wherever possible, copies of existing data dictionary

information, database user guides and system entity relationship diagrams should be obtained and made available as a part of this project documentation.

5. Develop a common data dictionary for the project. The data dictionary/needs assessment information will be developed for a standard CASE (Computer Assisted Systems Engineering) methodology.

6. Identify any business rules that apply to the management or use of the needed data. For example, some data that is needed may be considered confidential by the agency that collects it.

Stage I - Preliminary Strategy/Analysis Design.

In 2002 the SDM Team at the NWFSC successfully re-hosted the OWEB database into a web-ready[13] and GIS enabled Oracle repository. This repository is considered to be a prototype for the needed Habitat Project Tracking database. In addition SDM Web collaboration software has been developed. A feature of SDM Web is that it can manage any documents: reports, email, spreadsheets, data, maps or images and organize and manage these documents on a program-by-program basis. The "Metrics for Federal Fish Recovery efforts in the Columbia Basin" table (above) details a wide spectrum of needed information including plans, strategies and programs and summary information about individual actions. The SDM Web was designed to manage this variety of information types and can be developed to provide summary reports, ad-hoc query and graphs from attribute information.

The development team needs to be ready to discuss alternative choices for components of the preferred solution with the clients so that the clients are informed about the options and the consequences of selecting different alternatives. For example, alternatives concerning QA/QC.

Stage I Pilot testing.

Testing protocols and scripts should be developed as a part of the needs assessment. The design should anticipate satisfying these testing protocols and scripts, which must be based on realistic data needs. For example, tests could involve the delivery of specific data in a report format that meets the needs of a specific group such as the Federal Habitat Team.

Stage I - GO/NO GO

It is important to understand the role of a GO/NO GO decision in the RAD process. A go decision is supported when the development team identifies the range of alternatives and

[13] Currently OWEB is intranet enabled for demonstration purposes. SDM Web is being used internally with plans for Internet connectivity by 04-2003.

the user group selects the solution meets their defined needs. Following pilot development and use it will be necessary to make a longer term GO/NO GO decision concerning the ongoing management of RME data, either within the Federal agencies or through an alternative.

Program Review (or Independent Validation and Verification)

Program review and evaluation in information system development is termed independent validation and verification (IV&V). For this pilot proposal the IV&V will be completed at the end of the one-year operational period. The purpose of the IV&V is to provide the development team with feedback on system deficiencies and areas where improvements can be made.

Programmatic performance indicators for data management programs will also be used:

5) Were the defined user needs as specified in the design documentation?
6) Was on time delivery achieved based on the project plan?
7) Was on budget delivery achieved based on the project plan?
8) Does the effort satisfy the Internal Validation and Verification (IV&V) reporting requirements?

The Columbia Basin, as a region, has not adopted regional standards that could guide this proposal, for example, for completing metadata, for data collection methods, for GIS spatial data standards, or for compliance monitoring with a common data-dictionary. In the absence of existing regional standards the developers of this pilot will need to adopt standards that best fit the needs of the users and accommodate regional standardization if it should occur.

The Columbia Basin Cooperative Information System (CBCIS) project is addressing the need for standards, and, if there is support for such a regional approach, then development of regional standards/protocols are likely to be amongst the most important priorities. Depending on the timing these may benefit RME data management.

g. Facilities and equipment

For Part I and Part II

Location:

The SDM team is located at the NWFSC Research Laboratory at Montlake, Seattle. The Center has an information system development facility within the Center.

SDM Program and In-kind Resources:

The SDM team has an annual budget of approximately $600K for information system development related to salmon research and recovery.

For this proposal the SDM team is providing considerable in-kind resources in terms of: existing tools, technical knowledge and experience in application development, software, hardware and web capability for this pilot project and research on habitat projects. These resources are estimated to have a value of $330K.

Connectivity

The NWFSC facility is connected to the Internet via a T1 line to the NMFS regional Office at Sand Point and all servers are inside the firewall. Only the web servers will be located in the DMZ for outside access via the Internet.

SDM Development Environment

The development environment has been established using corporate software and hardware:

Oracle 8.1.7 DBMS w/440 Gigs
Oracle 9iAS, Oracle Designer 6i
ESRI SDE and IMS Web Server 2/420 Gig of Raid 5 for GIS Spatial data
ESRI/ERDAS License Key Manager
SDM Staff Fileserver 340 Gigs at RAID 5
5 Dual P4 1.7 Ghz 1 Gig Workstations/servers
Network upgrades to 100MB LAN and 1 Gig Fiber

SDM Production environment

The production environment will be based on dual-processor Intel Pentium 2.4 Ghz or better with 2 Gigs of system memory with 5 Terabytes of combined storage running MS 2000 Server software with both Apache and IIS, Oracle 8.1.7, Oracle 9iAS, ESRI, SDE and IMS.

SDM Staffing

Available project staff are: Richard Kang, Stewart Toshach, Vimal Nair, Jeffrey Cowen, Priya D Jhangiani, Ryan Hicks and Flo Damian (references below). Given the urgency and short time lines it may be necessary to use contract support for parts of this proposal.

Section 10 of 10. Key personnel

Richard S. Kang

2725 Montlake Blvd. E. ♦ Seattle, WA 98112 ♦ (206)-860-6786 ♦
richard.kang@noaa.gov

Objective

To provide leadership and project management in natural resource web enabled application development and data management.

Summary

I am interested in collaboration, communication, and coordination of NWFSC Salmon Data (tabular, spatial, and multi-media). I am the Salmon Data Management Team Leader and hope our group will be able to provide the necessary corporate information for your research needs.

Professional Experience

Supervisory Info. Technology Specialist GS-2210-14

Oct. 2000 to Present

National Oceanic and Atmospheric Administration (NOAA) - Currently serving as the team leader for the Salmon Data Management (SDM) Team for the Northwest Fisheries Science Center (NWFSC) for all listed endangered and threatened salmon species in the Pacific Northwest.

Primary duties include providing leadership in advancing a corporate repository approach to spatial and tabular data, documents, analytic modeling tools, and full text search capability over the web. Primary duties include forming sub teams on a project by project basis to develop core salmon applications and data for over 300 plus scientists and external customers. Tools used by the SDM team include Oracle 8.17 DBMS, Oracle 9i AS, Oracle Designer, Java, Microsoft Visual Basic, ASP, Access and ESRI Arc GIS, Spatial Data Engine (SDE), and Internet Map Server (IMS) application management and implementation on the Windows 2000 environment. I manage 2 permanent FTE's at the GS-12 level, a GIS Coordinator and a GIS Analyst, 1 PT Metadata specialist, and 5 to 6 contractors including 1 Oracle DBA/Designer/Developer, 1 Oracle Java Application Developer, 1 Tester, 1 Documenter, and 2 Graduate Research Assistants. I currently manage a combined budget of $650,000/yr with contributions from the Costal Services Center.

FS National Application Development Program Coordinator GS-0334-13

June 1999 to Oct 2000

Officially reassigned to Advanced Technology System Engineering (ATSE) Branch as the Forest Service (FS) National Oracle and Lotus Application Development Program Coordinator. Primary duties involved providing leadership in advancing Oracle and Lotus Notes application management and implementation on the IBM Unix environment. In addition, I was in charge of providing an enhanced National Application Development environment. I managed 4 contractors including 1 IBM Oracle DBA, 1 IBM Systems Administrator, 1 Mercury Tester and 1 Oracle Application Developer. Served as the FS Project Manager and COTR for implementing Phase I of the Louts Notes mail enabled versions of Paycheck, Travel, and Pontius applications in cooperative development with Lotus Professional Services.

Y2K/National Application Migration (NAMP) Program Manager GS-0334-13
July 1997 to June 1999

Reassigned as Forest Service (FS) Y2K/NAMP Program Manager from Policy, Planning, Standards staff. Reported directly to the Forest Service CIO, Jack Arthur starting Sept, 1997 to Nov. 1998. Principal duties involved coordination, national direction and project management for 40 Y2K field points of contacts (POC's); team leader for 3 Forest Service employees (matrix team) and 9 IBM contractors; managed a budget of $3,000,000 for FY 98 and $2,000,000 for FY 99; acted as the primary FS COTR for 26 application rehosting contracts with IBM; provided monthly Y2K status reports to USDA; provided documentation to various oversight groups including OIG, House Investigation and Surveys, and OMB; worked closely with the CIO on national application migration efforts involving 586 applications; met Y2K milestones and guidelines as outlined by GAO, OMB and the Department.

Computer Specialist GS-0334-12
May 1996- April 1997

Detailed to Region 10, Juneau, Alaska for 12 months as lead systems analyst to assist the Regional Litigation Team convert 1.2 million pages of microfiche, paper, and electronic documents. Rapid electronic access and retrieval was accomplished as compared to the microfiche and manual search process then in place using a document search engine and Adobe Acrobat PDF files on CD's. The new process was critically important in defending the ongoing $1.7 billion lawsuits against the Forest Service 50 year timber contracts. Dept. of Justice had estimated that the cost of converting and indexing 2.2 million pages would cost approximately $7.5 million dollars. The first 200,000 pages were converted from microfiche for less than $123,000 including capitalization of $87,000 in computer hardware and software over a 12 week period with a team of 5 Forest Service temporary employees.

Computer Specialist GS-0334-12
August 1993 to April 1996

Primary duties entailed Forest Information Management (70%) and R6/PNW Oracle CASE Coordinator (30%). As the Forest Information Manager, I assisted various program areas and users implement national database applications, trained end users, developed custom databases and reports in Oracle and worked with the Forest GIS and Planning Analyst to integrate the collection, maintenance, and use of natural resource data. As the Regional Oracle CASE Coordinator, I advised and assisted developers and program managers on their CASE projects, demonstrated capabilities of CASE, coordinated and facilitated training sessions, supported the ISAT Oracle database, and represented the Region at national IRM meetings and on national details.

Computer Specialist GS-0334-12
June 1991 to August 1993

I was the Regional Technical Approval Specialist for hardware, software, and service contracts and processed over $7 million dollars worth of approvals over the two years for mostly Unix and PC equipment, software and peripherals for 50% of my duties. In addition, I served as the principal lead designer for the satellite vegetation database project team over a six month period. I was also responsible for setting up a Unix learning environment for the Region in anticipation of award of Project 615 but also leveraged the equipment and software for Oracle CASE development. For 25% of the time I was the champion in the Region for use of Oracle Methodology and coordinated the seven team members in support of Regional Oracle Development through the use of Oracle CASE for generation of forms, reports and Oracle objects on the new SGI IRIX Unix and IBM PC OS/2 environments. I also volunteered over 40 days to Mt. Baker-Snoqualmie NF in Seattle, to lead a matrix team of seven members to develop a multi-media information kiosk

for Forest visitors with full motion video playback and touch screen running on an Amiga computer with a full screen 20" Sony monitor and Pioneer 12" laser disks.

Forest Planning Analyst GS-0460-09

August 1985 to Sept 1988

As a planning analyst for 38 months, I have been responsible for the compilation of forest resource data and information to be used in the Forest Draft Environmental Impact Statement. I assisted other resource specialist in interpreting and extracting output reports from FORPLAN (a linear programming model). As management directions changed, I assisted the team in the changing of the FORPLAN model to meet compliance with National Forest Management Act (NFMA), Resource Planning Act (RPA) and National Environmental Protection Act (NEPA). Assisted the forest economist in resolving sensitivity analysis in FORPLAN runs. In addition, calculated discounting, present net value and benefit/cost analysis from the forest resource outputs and activities generated from each alternative. In addition, I assisted the wildlife biologist utilize a wildlife habitat manipulation model using an electronic spreadsheet and application programs in order to do "what-if" analysis for population estimates.

Awards:

DATE	NATURE OF AWARD, etc.
8/2002	**On the Spot** $300 cash award from the Coastal Service Center, National Ocean Service, NOAA.
8/2000	**Certificate of Merit** and $1,000 cash award "For your valued leadership and outstanding work in preparing the organization for the deployment of Oracle 8I" signed by Jack Arthur, Forest Service CIO.
6/2000	**Group Honor Award for Excellence** and $1,000 cash award "For outstanding achievement in meeting the challenges of the Y2K millennium rollover while ensuring continued operation and delivery of program services." signed by Dan Glickman, USDA Secretary of Agriculture.
5/2000	Selected as **Forest Service Honoree** to the Dept. of Agriculture at the Government Computer News Forum in Washington, DC "for your commitment to the application of information technology for management improvement in government" from Ira Hobbs, USDA Deputy CIO, for deploying Lotus Notes and Domino applications to 34,000 users.
5/2000	**Y2K Service Medal** from President's Council on Year 2000 Conversion for outstanding service.
3/1999	**Certificate of Merit** and $3,500 cash award for leadership in the Forest Service Y2K and National Application Migration Project (NAMP). Reassigned as the FS Y2K Program Manager reporting directly to the Forest Service CIO, Jack Arthur.
8/1997	**Certificate of Merit** and $2,500 cash award for significant cost savings to the government "for extra effort in the development of an electronic full-text searchable database for the APC/KPC litigation microfilm (3.2 million images) from Phil Janik, Regional Forester.
12/1996	Detailed to R10 for Document Management Conversion Project for one year and received **On the Spot** $250 cash award for successful pilot from Fred Norbury, Regional Director of Policy, Planning, and Budget.
10/1996	Detailed to Boise, ID for 6 weeks to participate as a Forest Service representative to the National Wildfire Coordination Group in selecting CASE software, received **On the Spot** $100 cash award.
8/1995	Detailed to the Information Management Repository in Atlanta to assist and kickoff the IMR Center of Excellence for 2 weeks.

12/1994 **Certificate of Merit** and $600 cash award signed by the FS Chief, Jack Ward Thomas, "For outstanding contribution as a Core Team Member of the Information Management Implementation Master Plan Project" over a duration of 6 months.

12/1993 Letter of thanks "In recognition of and appreciation for service on the President's Ecosystem Management Assessment Team", signed by Jack Ward Thomas, Ecosystem Project Leader.

12/1993 Developed a multimedia Amiga based touch screen kiosk with full motion video and sound on a Pioneer laser disk for Forest visitors for the Mt. Baker-Snoqualmie NF. Served as the core team leader with 7 other members volunteering 40 days of personal time over a year and half while working at the Regional Office in Portland.

11/1993 Letter of appreciation for work on the Agency Wide Strategy Study while on detail for 2 weeks to the WO.

11/1992 **Certificate of Merit** and cash award for $800 signed by John E. Lowe, Regional Forester, "In recognition of your efforts in the development the ISAT Oracle data base" in Region 6 for 6 months over a 2 year period.

6/1992 Detailed to WO for work with CS&T (Rob Holmes) and Personnel staffs in the development of the People Download database for 6 weeks.

11/1990 **Certificate of Merit** and $1,000 cash award signed by Doug McWilliams, Mt. Baker-Snoqualmie National Forest Supervisor, "For outstanding performance in assisting the Engineering organization of the Forest in acquisition of computer equipment," software and training worth $250,000.

5/1990 Letter of thanks for contribution as a member of Train the Trainers for DG Oracle in Region 6, Portland.

11/1988 Letter of appreciation for help in the analysis of 12,000 public responses to the Draft Environmental Impact Statement and Proposed Forest Plan developing a relational database application and reports with ad-hoc queries on a PC for 5 months.

7/1988 **Certificate of Merit** and $600 cash award signed by the Regional Forester for outstanding contribution in the development of the Trails Information System (TRIS) program for IBM PC's and DG computers for 6 months.

10/1987 Received a plaque for significant contribution and completion of the Forest Draft Environmental Impact Statement while on the Land Management Planning Team for 2 years.

1/1986 **Certificate of Merit** and $500 cash award "for efforts at technical innovations in use of field data recorders, development of procedures, and programs" for field application to the Genetic Tree Improvement and Stand Exam Programs signed by Doug McWilliams, Forest Supervisor, Mt. Baker-Snoqualmie National Forest.

STEWART C. TOSHACH - Data Analyst, Facilitator

2725 Montlake Blvd East, Seattle, WA 98112-2092 (206) 860 3495
Stewart.Toshach@noaa.gov

SUMMARY:
Twenty-five years experience with government, corporate and not for profit organizations. Experienced and skilled in information system, organizational and policy development, project management, writing, public speaking, fund-raising, economic analysis and work in multi-disciplinary environments.

EDUCATION:
Commonwealth Postgraduate Scholarship, Australian National University, 1979; MS. 1976 (Resource Management) and BS 1974 (Botany and Zoology) University of Canterbury, New Zealand.

EXPERIENCE:

October 2002 to present. IPA from Columbia Basin Fish and Wildlife Authority to NWFSC for technical analysis on Columbia Basin Cooperative Information System (CBCIS) project and data management for 2000 FCRPS Research, Monitoring and Evaluation Plan.

July 2000 to August 2002. Contractor to Northwest Fisheries Science Center for the CBCIS Project. Member of CBCIS project team.

1997 to July 2002 Contract Project Coordinator to Northwest Fisheries Science Center's (NWFSC) Electronic Fish Catch Logbook Project involving the development of an at-sea reporting technology and web-site and Oracle database for fishermen, processors and resource managers.

1995 to present. Facilitator for various planning workshops: Skagit Valley College Board of Trustees and Foundation Board, Skagit Farm Bureau, Skagitonians to Preserve Farmland, Community Design Exchange and others.

1993. Consultant, Washington State Department of Ecology, Olympia. Reviewed state wetland permitting process and staff roles.

1992. Program Manager for Governor's Transition Team "Ethics in Government" and "Efficiency and Effectiveness in Government".

1991-92. Scientist, Washington State Department of Ecology, Olympia, WA. Developed Washington State Wetlands Rating System.

1990. Program Manager, Puget Sound Water Quality Authority, Seattle, WA. Author Wetlands Program for the Puget Sound Water Quality Plan.

1988-89. Developer and Trainer, Catalyst Consulting Team, Santa Cruz, CA. Completed team training for corporate clients.

1980-87. Project Manager, Department of Environment and Planning, Sydney, Australia. Senior Advisor on state water resource management policy and forestry policy.

1976-77. Project Manager –Scientist, Canberra College of Advanced Education, Canberra Australia. Completed nutrient budget for urban lake system.

1976. Regional Planner, Ministry of Works and Development, Christchurch, New Zealand. Evaluated regional development, environment and economic impacts.

Jeffrey W. Cowen
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CAREER OBJECTIVE: maintain an expert skill level in GIS technologies and application development, in order to provide better decision-making tools.

EDUCATION:

MS Geography, University of North Carolina at Charlotte 1993

Thesis: A New Method for Calculating Slope Length
B.A History, Clemson University, Clemson, SC 1991

GEOGRAPHIC INFORMATION SYSTEMS SOFTWARE SKILLS:
Arc/Info, GRID, TIN, ArcView GIS, ArcGIS 8.0, ArcObjects, Spatial Analyst, MapObjects, ESRI Internet Map Server, ERDAS

PROGRAMMING SKILLS:
Visual Basic, ArcObjects, Avenue, AML, Visual Basic Script (ASP), JavaScript, PLSQL, HTML

PROFESSIONAL TRAINING COURES: What's New in Arc/Info 8.0, Advanced Arc/Info, Cell Based Modeling with GRID, ArcView, Programming in Avenue, Programming ActiveX Components in Visual Basic, Instructor Training

TEACHING EXPERIENCE:
ESRI certified Avenue and ArcView instructor since 1998 - 2001

WORK EXPERIENCE:
GIS Analyst and application developer, National Oceanic and Atmospheric Administration, Northwest Fisheries Science Center, Seattle WA (July 2001 – Present)

- Develop Internet Map Server applications using ESRI's ArcIMS technology:
    1. to dynamically display salmon recovery projects from Oregon and Washington
    2. to allow users to interactively add spatial locations for new recovery projects
    3. to create spatial queries to retrieve data from the NWFSC Salmonid Database
    4. to display results of queries from the NWFSC Salmonid Database
- Program interactive ArcView extension for summarizing data to be used in Salmonid Watershed Analysis Model
- Develop methodology and ArcObjects applications for populating an SDE database to represent the spatial locations in the NWFSC Salmonid Database
- Design and maintain Oracle SDE database for NWFSC GIS staff
- Create PLSQL procedures to query Oracle databases to determine spatial locations for the NWFSC Salmonid Database

Lead GIS application developer, National Oceanic and Atmospheric Administration, Coastal Services Center, Charleston SC (1998 – July 2001)

- Program interactive ArcView and Visual Basic model to evaluate the relative significance of wetland systems
- Create ArcView scripts and extensions and Visual Basic interfaces
- Develop Internet Map Server applications, focusing on MapObjects IMS applications and ArcIMS technology
- Train and consult users in GIS technical software

Technology Planning and Management Corporation, on site Spatial Data Specialist for the NOAA Coastal Services Center, Charleston SC (July 1995 – 1998)

- **Developed GIS applications, focusing on ArcView scripts and extensions**
- **Developed Internet Map Server application, focusing on MapObjects IMS**

Environmental Systems Research Institute Technical Support Analyst, Redlands, CA (September 1993 - July 1995)

- Supported clients in all areas of the Arc/Info software package with emphasis in GRID, TIN, Image Integrator, Data Translators, and ArcView
- Developed applications with AML and Avenue
- Resolved data conversion problems
- Researched software bugs and Created technical documentation

Graduate School Internships:

- City of Charlotte North Carolina, Department of Engineering (spring 1993)
- Environmental Systems Research Institute (summer 1992) Charlotte, NC
- Urban Institute at UNCC (fall 1991)

AWARDS:

- First place 1997 ESRI User Conference: MapObjects Application Competition
- Second Place 1997 ESRI User Conference: Avenue Application Competition
- Third place 1996 ESRI User Conference: Avenue Application Competition

PUBLICATIONS and PRESENTATIONS

A Proposed Method for Calculating the LS Factor for Use with the USLE in a GRID-Based Environment, Proceedings, 1993 ESRI Users Conference

Bringing the Ecological Characterization of Otter Island, South Carolina Prototype to the World Wide Web, Proceedings, 1997 ESRI User Conference

Making NOAA Nautical Charts ArcView Accessible, Proceedings, 1998 ESRI User Conference

Using MapObjects to go from ArcView to the Internet in 15 Minutes, Proceedings, 1999 ESRI User Conference

South Carolina Coastal Region Evaluation of Wetland Significance, Proceedings, 2000 ESRI User Conference

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INTRODUCTION

Information Technology professional with 12 years of experience **in Oracle Database Design, System Architecture, Software development, Implementation, trouble shooting, Performance tuning, Database Administration, Software Installation and Configuration and Data Migration.** Experience with most recent version of Oracle Database, Design and development tools. Experience in the business areas such as Aerospace, Insurance, Telecommunication, Financial accounting, Purchase Management & Order processing. Good written and verbal communication skills, inter personal skills and trouble-shooting skills and I'm a self-motivated and result-oriented professional with a solid work ethic

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EXPERIENCE

Computer Skills:

Hardware:	IBM PC's and compatibles, RS/6000, Unisys U6000, Pyramid Nile, Altos-4500, HP-9000, Sun, Sequent
Operating Systems:	Unix, AIX, Solaris, Windows NT/2000, 98 and 95
Databases:	Oracle8i, Oracle 7.x and 6.0, SQL Server
Development Tools:	PL/SQL, SQL Plus, Developer/2000, Oracle Developer(Forms & Reports), Oracle Applications, Business Objects, Oracle9iAS & Oracle Portal Technology, PSP, JSP, HTML
Case Tools	Designer/2000, Oracle Designer, Erwin
Web Server	Oracle9iAS
Configuration	ClearCase, TrueChange, RCS **Management Tools**

EXPERIENCE HIGHLIGHTS

FRANK-ORTH ASSOCIATES (Feb 2002 to Present)

- **Northwest Fisheries Science Center**

  Working as System designer/developer on the TRT status review project. Scientists will use this system to add, modify and analyze different time series data (Abundance, Harvest, Hatchery Fraction, Age Structure) and ArtProp data to produce the Status review reports. This system will support all type of ad-hoc query reporting requirements, different data exchange mechanisms, produce analysis reports with graphs, charts etc. complete integration with spatial data to support spatial queries.

BEST Consulting (Aug 1996 to Dec 2001)

- **The Boeing Company(Jan 2001 to Present)**

- **Working as DBA/Technical Lead** on a highly complex design package called Unified Electronic Interface Control. Boeing engineers use this software to define the electrical and signal interfaces between electronic and electrical equipment's in flight control system. The Approved Data set maintained by the application were the contractual specifications for interface signals that Boeing provided to equipment suppliers, Simulator manufactures, Test Equipment manufactures etc. This application will be used in all existing commercial airplane programs and future airplane programs.

Job Responsibilities

- Software installation, Database Creation and Configuration for Development & Test Environment
- User Accounts and Security management
- Database design
- Installation of Development tools and solving connectivity issues.
- Supporting Data Migration from Interbase to Oracle
- Migration of Oracle Designer Repository (Designer 1.2) from Oracle 7.3 to Oracle 8.1.6 and Oracle Designer6.0
- Development of Data entry Screens Using Oracle Developer Forms and Reports Using Oracle Reports.
- Development of Database Triggers, Procedures and Functions
- Developed Scripts for Monitoring Database activity, Space Management etc
- Technical support for Developers and problem solving
- Formulating the Backup strategies for the Development & Repository Database
- Formulating the Application Security policy in Test & Production Environment
- Object sizing and placement, de-fragmentation, database tuning, query optimization and troubleshooting
- Performance Tuning of Application & Database
- Installation of Oracle IAS9i and configuration of Oracle Portal on NT
- HP-UX 11.0, Oracle RDBMS 8.1.6, Oracle Developer 6i, PL/SQL ,Oracle Designer6

- **Captura Software(June 2000 to Nov 2000)**
- **Worked as DBA and Ddatabase Design Engineer**

Job Responsibilities

- Installation and configuration of Development & Test Databases
- Formulated backup and recovery, migration and upgrade strategies for Captura's development and test database and for their customers' production databases.
- Performed technical support for other developers .
- Developed Database procedures, functions, database triggers for the application using PL/SQL
- Performance tuning of Database procedures & Database.
- Supported worldwide customers to resolve complex database issues which Captura's support team could not resolve.
- Developed tools for Capturing Custom Index Information before application upgrade and re-creating the custom indexes required automatically.
- Conversion of Database Functions from SQL Server to Oracle .
- WINDOWS NT, HP-UX 11.0, Oracle RDBMS 7.3 & 8.1.6, PL/SQL

- **Vodafone Airtouch/ Verizon Communications(March 1999 to April 2000)**
- **Worked DBA and Database Design Engineer** on a highly complex cell site design application, NEOSYS, which was used to create and maintain cell sites, propose new sites in cellular markets, link and maintain switches, transmitters, amplifiers, antennas, repeaters, and splitters.

Job Responsibilities

- Software installation, Database Creation and Configuration for Development & Test Environment
- User Accounts and Security management
- Database design
- Developed Database procedures for batch jobs using PL/SQL, procedures executed using DBMS_JOB.
- Formulated Application Security policy
- Developed Scripts for Monitoring Database activity, Space Management etc.
- Problem solving, resolving connectivity issues and access problems
- Application performance tuning, technical advice to team members and management on resolution of technical problems, and implementation of new technology.
- Extensively used PL/SQL to create database triggers, procedures, packages, and functions.
- WINDOWS NT, HP-UX 10.2, Oracle RDBMS 7.3 & 8.1, Developer2000, Designer/2000, PL/SQL, Pro*C

- **The Boeing Company(July 1997 to February 1999)**
- **Worked as DBA/Technical Lead** on a highly complex design package called ICD98, interface control document. Boeing engineers used this software to define the electrical and signal interfaces between line replaceable units in an airplane. The reports generated by the application were the contractual specifications for interface signals that Boeing provided to equipment suppliers. This application was used in all commercial airplane programs, 737, 747, 757, 767, and 777.

Job Responsibilities

- Software installation, Database Creation and Configuration for Development & Test Environment
- User Accounts and Security management
- Database design
- Installation of Development tools and solving connectivity issues.
- Automating Data Load from flat files to Oracle Database
- Development of Database Triggers, Procedures and Functions
- Technical support for Developers and problem solving
- Formulating the Backup strategies for the Development & Repository Database
- Formulating the Application Security policy in Test & Production Environment
- Performance Tuning of Application & Database
- HP-UX 10.2, Oracle RDBMS 7.3, Designer/2000, Developer/2000, PL/SQL, Oracle Graphics

- **The Boeing Company (August 1996 to June 1997)**
- **Worked as DBA/Technical Lead** on a highly complex data-analyzing package called MMMS96, Maintenance Message Monitoring System.
- This package was developed for accessing 777 central maintenance computer airline in-service present leg fault data and fault history. The main objective of this system was to provide efficient and user-friendly tool for Boeing system engineers to analyze the system faults, which occurred on in-service customer airplane.

Job Responsibilities

- Software installation, Database Creation and Configuration for Development & Test Environment
- User Accounts and Security management
- Database design
- Installation of Development tools and solving connectivity issues.
- Automating Data Load from flat files to Oracle Database
- Development of Database Triggers, Procedures and Functions
- Technical support for Developers and problem solving
- Formulating the Backup strategies for the Development & Repository Database
- Formulating the Application Security policy in Test & Production Environment
- Performance Tuning of Application & Database
- HP-UX 10.2, Oracle RDBMS 7.3, Designer/2000, Developer/2000, PL/SQL, Oracle Graphics

Mastech Corporation (Nov 1994 to July 1996)

- **Oxford Health Plans, CT (November 1994 to July 1996)**
- **Worked as Software Engineer** on an integrated health care management system.
- This was developed for Oxford Health Plans, one of the leading insurance companies in the United States.
- Involved in the computerization of the entire company's operations, from sending proposals to customers, enrolling members, billing, processing claims, and enrolling providers.
- Assisted with the migration of data from Pick Basic-based system.
- Utilized CASE methodology throughout the project.
- Participated in the design and development of forms, reports and processing procedures for communication, medial management, and provider and claim modules.
- This application has over 500 entities

- IBM RS6000, AIX, Oracle RDBMS 7.2,Oracle Case, Oracle Forms4.0, Oracle Reports

Oman Computer Services(February 1993 to October 1994)

- ***Ministry of Education, Sultanate of Oman, Library information management system***

- Involved in the requirement analysis, study, design, and development of the system.
- This system was developed for the complete automation of all libraries in schools and colleges.
- Automated the process of getting suggestions from students about required books, approval of the suggestions, purchase, book issue, return, renewal, and reservation.
- IBM RS6000, AIX, Oracle 7.2, SQL Forms 3.0, SQL ReportWriter, SQL Menu, PL/SQL

- **Ministry of Interior, Emigration clearance system**

- Involved in the study, design, preparation of program specifications, and development of the system. The system automated the various activities of this ministry, for example, passports, road permits to neighboring countries, marriage registration, and processing of citizenship applications.
- IBM RS6000, AIX, Oracle 7.2, SQL Forms 3.0, SQL ReportWriter, SQL Menu, PL/SQL

- **Ministry of Finance and Economy,** The taxation computer system:

- Involved in the preparation of program specification and development of the system. TCS was a comprehensive multi-user system that covered all activities of company taxation handled by various departments. For example, receipt of provisional and annual returns of income from companies, sent notices and reminders, assessing the taxable income of the companies, keeping track of taxation status of companies, and so on. The main objectives of TCS were to adjust losses and compute exact and precise tax liability.
- Carried out the processing of excess payments as per the company income tax law of 1981 and the relevant ministerial ruling, had the taxation status of each company each year available to users at all time, handled multiple tax schedules, and integrated with the financial accounting system.
- IBM RS6000, AIX, Oracle 7.2, SQL Forms 3.0, SQL ReportWriter, SQL Menu, PL/SQL

- **Ministry of Education**

  - Developed and implemented the planning management system:

- Computerized the entire functions of the educational planning department.
- IBM RS6000, AIX, Oracle 7.2, SQL Forms 3.0, SQL ReportWriter, SQL Menu, PL/SQL

- **Royal Oman Police**

- Developed a stock control and purchase system. The objective of the system was to provide on-line information of inventory of items, maintaining inventory of items at several warehouses and purchase of items from various vendors. This system provided valuable MIS reports aimed at keeping inventory low without affecting business and up to date vendor information.
- HP-UNIX, Oracle 7.2, SQL Forms 3.0, SQL ReportWriter, SQL Menu5.0, PL/SQL

SONATA Software, INDIA *(July 1992 to February 1993)*

- **Management information and project monitoring**

- As a Software Engineer involved in the study, design, development, and implementation of the system for internal use of Sonata. The system provided valuable information about future man power requirements, progress of overseas projects, invoice payment details of overseas clients, employee information like insurance, loan recovery, and so on.
- UNIX ,Oracle RDBMS 6.0, SQL Forms, SQL Report Writer, PL/SQL

- **Automatic downsizing**

- Worked with a group to develop a tool to convert an existing application from CICS, DB2, and COBOL to an Oracle environment.
- Involved in the development of hotel management system in Oracle, which was used for checking the correctness of the tool output. The tool was capable of converting screen-handling programs in COBOL to inputs in Oracle.
- UNIX, Oracle RDBMS 6.0,SQL Forms 3.0

SunTec Corporation, INDIA (January 1990 to July 1992)

- **Online cash counter accounting**

  - Involved in the study, design, development, and implementation of the system for the Department of Transportation, Government of India. The objective of the system was to account the payments received in cash counter and issue receipts. This system was capable of handling telephone bill payments, demand note payments, and various types of voucher payments.

- Utilized Unisys U 6000, Unix, Oracle 6, SQL Forms 3.0, SQL ReportWriter, and SQL Menu 5.0.

• **Commercial information system**

- Involved in the development of this system for the Department of Telecommunications, Government of India. The system provided the facilities for registration of new telephone applications, demand note issues, feasibility studies, cable pair information, waiting list statistics, and other valuable reports for decision making.
- Utilized Unisys U 6000, Unix, Oracle 6, SQL Forms 3.0, SQL ReportWriter, and SQL Menu 5.0.

• **Telephone revenue and accounting system(Transaction Business Management System TBMS)**

- Involved in the development of data entry forms, reports, Pro COBOL program for error checking between first entry and second entry of critical data for billing, bill processing and printing, sub-ledger review, duplicate bill issue, and so on. The different modules of the system were trunk module, local call, phonograms, international trunk, bill processing, payments etc.
- This product has over 250 installations worldwide , more information can be found at *http://www.suntecgroup.com/sg/index.html*
- Utilized Unisys U 6000, Unix, Oracle 5.1, SQL Forms 2.3, RPT Tools, SQL Menu 5.0.

• **Payroll and purchase monitoring system**

- Developed this system for the Office of Technology Park, Government of India. This system was capable of issuing pay slips and handling purchase of office stationary items from quotation processing to payments.

EDUCATION/ACCREDITATION

Diploma	Post Graduate Diploma Computer Science and Applications Kerala University, INDIA
MS	Physics Mahatma Gandhi University,INDIA
BS	Physics

Priya D Jhangiani

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Objective

To find a challenging position that will enable me to leverage my past experience along with my recently acquired technical skills.

Summary

I am a self-motivated professional with multiple college degrees, and various technical certificate courses completed recently on Software Testing and Microsoft development tools. I have successfully managed and delivered in high-pressure environments leveraging my excellent interpersonal, teamwork, and communications skills.

Professional experience

National Oceanic and Atmospheric Administration (NOAA) – Volunteer as an Application Tester for NWFSC Jan 2003 – Current

As a volunteer tester at NWFSC within NOAA, I wrote the Test plan, test cases for the SalmonId Database application. The SalmonID Database is a web-based application built using Oracle Forms with an Oracle database at the backend. I am currently conducting the systems integration and user acceptance testing using a structured testing approach. The issue tracking and management is done using an issue tracker spreadsheet that I helped design for this testing initiative.

Seattle Audubon Society – Volunteer for Web-site Development, Sept 2002 – Current

As a volunteer for the Seattle Audubon Society, I developed all the web forms including membership forms, volunteer applications, bird ballot, etc. for the redesigned Seattle Audubon Society website, www.seattleaudubon.org. These forms were built using Active Server Pages, JavaScript, HTML and MS. Access on the back-end. Additionally, I helped with the Quality Assurance (QA) on the new web site prior to its launch.

Asst. Attorney: Kanga & Co. – Corporate and tax law firm, Bombay, India, June, 1995 - Sept 1997

Job responsibilities included assisting partners in various legal matters such as property transfer transactions, preparing legal documents including business contracts and agreements, and conducting research to provide legal opinion to clients in response to queries on company law matters.

Highlights:

I was solely responsible for conveyance, drafting of complex agreements for property sales, filing with appropriate authorities to get the necessary authorizations, and finalizing the transfer deeds. Additionally, I was given special assignments to work as a liaison between the client team, and the legal counsel team covering all activities related to civil litigation at the Bombay High Court.

Legal Assistant: D.M. Harish & Co – Corporate and tax law firm, Bombay, India, June, 1994 – May, 1995

Job responsibilities included finalization of all documents for incorporation of a company. I was also responsible for assisting the partners in getting required approval for Non-resident Indian clients' to buy and sell property in India, and in finalizing the property transfer transactions and also getting other necessary approvals for various other transactions. This included regular communications with the clients to get all required information, and maintaining an ongoing dialog with the registrar to speed up the process.

Highlights:

As part of a functional team, I helped define a streamlined process to handle company incorporation requests within the firm. This resulted in approximately a 30% reduction in process time. I handled a large volume of foreign currency transactions during my assignments with the NRI clients and was solely responsible for getting all the necessary approval for this client-base with minimal supervision.

Education and Affiliations

Software Testing Series, Bellevue Community College, July 2002

- Introduction to Software Testing
- Software Testing in Practice
- Test Planning
- Client/Server and Website Testing

Certificate Program: ASP & Visual Interdev, Aptech Computers, Bombay, India, March 2001
Certificate Program: Visual Basic, HTML, CGI/Perl, Lake Washington Technical College, Dec 1998.
Bachelor of Law (LLB), University of Bombay, India, May 1996
Bachelor of Commerce (B.Com), University of Bombay, India, May 1993
Member: Bar Council of Maharashtra and Goa, India

Computer Skills

Software Testing (Proficient)
MS Office Suite (Excellent)
Relational Databases: Access (Excellent), Oracle (Familiarity)
Programming languages: MS Visual Basic (Familiarity), SQL (Proficient)
Development Tools: Oracle Forms, Oracle Reports (Familiarity)
Scripting languages: ASP (Familiarity), HTML (Excellent), Java Script (Proficient)& CSS (Familiarity)

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WORK EXPERIENCE

NOAA – NWFSC Salmon Data Management Team – GIS Developer/ Analyst 09/02 - present

Currently involved in the set-up of an Oracle / ArcGIS data node for salmon related data. Wrote PL/SQL code to interact with user form. Wrote code java code to simplify user interaction with an existing ArcIMS implementation.

UrbanSim / University of Washington – GIS Developer /Analyst 05/02 – 09/02

Wrote code for synthesizing necessary UrbanSim input data from a variety of sources using ArcObjects, ADO, SQL and AML. Emphasis on GIS – database interaction. Worked with **SQL Server**, **MySQL** and **Access** databases.

Rural Technology Initiative/University of Washington – GIS Application Developer 08/01 – 05/02

Developed custom **ARC 8.1** applications for analyzing sediment delivery from forest roads with **ArcObjects** and **Visual Basic**. Implemented a sediment modeler from forest roads. Derived a methodology for instant evaluation of cross drain culverts during design. Created a user interface for interacting with these models. Skilled with **COM** object development.

USDA Forest Service Pacific NW Research Station -GIS Analyst 11/99 – 08/01

Wrote custom **JAVA** programs for data analysis, filtering and surface modeling of on Airborne Laser Scanned data. Implemented a **Baesian** simulation filter for under-canopy digital elevation model creation from Laser data. Performed analysis on Airborne Laser Scanned data and produced various graphic outputs using **ArcInfo**, **ArcView**, UNIX power tools and standard MS Office package under both **NT** and **UNIX** platforms. Also skilled with **GPS** and Criterion and Total Station used on occasional field measurements.

University of Washington - Web Developer 10 /99 – 02/00

Designed and maintained the early version of the Forest Engineering FE341 Class Page found at:

http://courses.washington.edu/fe341 using Macromedia Dream Weaver, Adobe Page Mill, **JavaScript** and plain **HTML**.

Romanian Institute of Forest Research and Forest Planning, Bistrita, Romania

Forest Engineer, 09/96- 03/97

Ran surveys and gathered data for long term planning in National Forest.

EDUCATION

Master of Science, 06/02

University of Washington, College of Forest Resources, Seattle Washington

Relevant Coursework: Principles of Cartography, Analytic Cartography, Geographic Information Systems Analysis, Introduction to Photogrammetry, Graphics Application Development in JAVA, Watershed Analysis, Wild Land Hydrology

Engineering Degree in Forest Engineering, 06/96

Transilvania University, College of Silviculture and Forest Engineering, Brasov, Romania
Graduation Project in Forest Harvesting
Awarded the Engineer Diploma.

OTHER RELATED EDUCATION

Developing Servlets and Java Server Pages – Professional training through ORACLE. Learned the principles of developing interactive database driven web applications.

Attended ArcInfo version 8 Workshops and Training Sessions at 2000 ESRI User Conference

COMPUTER SKILLS

Software Applications: ArcView GIS, ArcInfo, ArcGrid, Crystal Reports, Visio, Microsoft Office
Programming: JAVA, Visual Basic, ArcView – Avenue, AML, HTML

LANGUAGES

French: conversational

REFERENCES

Available upon request

RYan Hicks

objective

To create original, dynamic, and effective projects that make the most out of available resources. To help clients find the best possible solution for any problem they may have.

Experience

Currently — Northwest Fisheries Science Center — Seattle, WA

Data Coordinator

- Liaison between database/web development team and customers, including scientists, administration and external stakeholders.
- Website administration including Testing, Project Tracking, & Design.
- Supported GIS Directory Creation.
- GIS Data Quality Assurance.
- User Interface Analysis and Design.
- Coordinating collaboration with external customers.
- Tracked Employee Awards & Promotions in HR Database.
- Event Planning for 70th Anniversary Open House.

2002 — Latino Northwest Communications — Seattle, WA

Marketing Consultant

- Created new Media Kit focused on benefits to potential advertisers.
- Created Advertising client database and sales plan to increase advertising revenue.
- Created reader survey to define customer base and readership.

1999–2002 — Concessions International — Portland, OR

Supervisor, Bartender, Server

- Supervised up to 15 employees.
- Helped Rework menu to remove unprofitable items.
- Trained new employees.

Education

2000–2002 **University of Washington** Seattle, WA

- **B.A., Business Administration, Marketing concentration. 3.64 GPA**

Interests

Soccer, Advertising, Guitars, Sunshine.

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