



Independent Scientific Review Panel
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Final Review

of

Fiscal Year 2003

Mainstem and Systemwide

Proposals

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ISRP Final Review of Fiscal Year 2003 Mainstem and Systemwide Proposals

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Table of Mainstem and Systemwide Proposals by Project ID

ProjectID	Title	Sponsor	ISRP Final	CBFWA Category ¹	ISRP Comparison with CBFWA	Page
30007	An Acoustic Tracking Array for Studying Ocean Survival and Movements of Columbia River Salmon	Kintama Research Corp.	Fundable in Part (Qualified)	TBD - Do Not Fund (Estuary)	Disagree - Fundable in Part	28
30010	Canada-USA Shelf Salmon Survival Study	DFO	Fundable in Part (Estuary)	TBD - Do Not Fund (Estuary)	Disagree - Fundable in Part	29
35001	Habitat Monitoring and Restoration Program for the Lower Columbia River and Columbia River Estuary	LCREP	Withdrawn	Withdrawn	Withdrawn	31
35002	Determine origin, movements and relative abundance of bull trout in Bonneville Reservoir.	WDFW, YN	Fundable in Part	Urgent	Disagree - Lower Priority	19
35003	Vitality based studies of Delayed Mortality	UW	Fundable	Recommended Action	Agree	70
35004	Harvest Model Development	UW	Do Not Fund	Do Not Fund	Agree	89
35005	Independent Economic Analysis Board	NPPC	Not Applicable	NWPPC responsibility	Not Applicable	103
35006	Use of Mainstem Habitats by Juvenile Pacific Lamprey (<i>Lampetra tridentata</i>)	PNNL	Fundable	Recommended Action	Disagree - Higher Priority	18
35007	Evaluate Restoration Potential of Snake River Fall Chinook Salmon Spawning Habitat	PNNL	Fundable	Recommended Action	Disagree - Higher Priority	50
35008	Systemwide Lamprey Program Coordinator	USGS, CRRL	Fundable in Part	High Priority	Disagree	16
35009	Evaluate Status of Pacific Lamprey in the Willamette River Subbasin	ODFW	Fundable	High Priority	Agree	19

¹ CBFWA ranks the proposals in the following prioritization categories:

- **Core Program** - These projects are integral to the infrastructure and/or information needs of the F&W Program in the Columbia River Basin for planning and management.
- **High Priority** - These projects or tasks within a project are high priority within the subbasin. The project addresses a specific need within the subbasin (program) summaries.
- **Recommended Actions** - These are good projects that cannot demonstrate a significant loss by not being funded this year. These projects should be funded, but under a limited budget, they could be delayed temporarily without significant loss.
- **Do Not Fund** - These projects are either technically inadequate or do not address a need within the subbasin (program) summaries. These projects may be inappropriate for BPA funding.

For an explanation of ISRP recommendation categories go to page 2 of the report.

ProjectID	Title	Sponsor	ISRP Final	CBFWA Category ¹	ISRP Comparison with CBFWA	Page
35010	An Interactive Biodiversity Information System for the Columbia River Basin	NW Habitat Institute	Fundable in Part	Core Program*	Agree in Part	76
35011	The Floating Net Pen Transportation System Pilot Project	Columbia Basin Fishery Restoration L.L.C.	Do Not Fund	Do Not Fund	Agree	71
35012	Spatial scales of homing and the efficacy of hatchery supplementation of wild populations	NMFS	Fundable	High Priority	Agree	41
35013	Species- and site-specific impacts of gas supersaturation on aquatic animals	CRRL	Fundable in Part	High Priority	Agree in Part	55
35014	Measurement of Quantitative Genetic Variation Among Columbia River Basin Chinook Propagation Programs	CRITFC	Fundable	High Priority	Agree	34
35015	Replicated stream system for the evaluation of hatchery and wild juvenile salmonid interaction and development of innovative culture technologies	UI/ CRITFC	Do Not Fund	High Priority	Disagree	43
35016	A Pilot Study to Test Links Between Land Use / Land Cover Tier 1 Monitoring Data and Tier 2 and 3 Monitoring Data	NWFSC	Do Not Fund	High Priority	Disagree	79
35017	Inventory and Synthesis of Physical Process Models and Methods to Supplement Habitat Conditions Analysis and Subbasin Planning	KWA and Golder	Do Not Fund	Recommended Action	Disagree	82
35018	Evaluate recreational and commercial mark-selective fisheries.	WDFW; UI	Withdrawn	Withdrawn	Withdrawn	84
35019	Develop and Implement a Pilot Status and Trend Monitoring Program for Salmonids and their Habitat in the Wenatchee and Grande Ronde River Basins	NMFS - NWFSC	Fundable (Qualified)	Urgent*	Agree	80
35020	Regional Project Effectiveness Monitoring Program for Columbia River Basin Listed Anadromous Salmonids.	NMFS - NWFSC	Do Not Fund	Urgent	Disagree	81

ProjectID	Title	Sponsor	ISRP Final	CBFWA Category ¹	ISRP Comparison with CBFWA	Page
35021	Purchase And Evaluation of Automated Marking and Tagging Systems (MATS)	ODFW	Do Not Fund	Recommended Action	Disagree	94
35022	Habitat Mitigation Tracking System	Steward and Assoc.	Fundable (Qualified)	Do Not Fund	Disagree	82
35023	Establish Relationship between Fish Passage Survival and Turbine Operating Efficiency	Normandeau Assoc.	Do Not Fund	Do Not Fund	Agree	71
35024	Evaluating the sublethal impacts of current use pesticides on the environmental health of salmonids in the Columbia River Basin.	NMFS - NWFS	Fundable	Urgent	Agree - Priority Uncertain	59
35025	Optimization of FCRPS Impacts on Juvenile Salmonids: Restoration of Lower-Estuary and Plume Habitats	OHSU	Fundable	Recommended Action	Disagree - Higher Priority	24
35026	On-line Subbasin Planning/Watershed Newsletter	Intermtn. Comm.	Fundable	Recommended Action	Disagree - Higher Priority	99
35027	Evaluation of Two Captive Rearing Methods for Assisting with Recovery of Naturally Spawning Populations of Steelhead and Coho Salmon	USFWS	Fundable	Urgent	Agree	44
35028	Evaluate White Sturgeon Nutritional Needs & Contaminant Effects Influenced by the Hydroelectric System	PSU	Fundable	Recommended Action	Agree	14
35029	Transfer IHN virus genetic strain typing technology to fish health managers	WFRC	Fundable	High Priority	Disagree - Urgent	49
35030	Evaluate potential to enhance spawning of summer/fall chinook salmon in the tailrace of Chief Joseph Dam, Columbia River	PNNL and CCT	Fundable	Urgent	Agree - Fundable as Modified	51
35031	Tagging Study Technical Committee	BPA	Do Not Fund	Recommended Action	Disagree	65
35032	Assess the Feasibility of Reducing Predation on Juvenile Salmonids in the Columbia River Through Operation of the Hydropower System	USGS, CRRL; ODFW	Do Not Fund	High Priority	Disagree	23
35033	Collaborative, Systemwide Monitoring and Evaluation Program.	CBFWA	Fundable	Core Program*	Agree	78

ProjectID	Title	Sponsor	ISRP Final	CBFWA Category ¹	ISRP Comparison with CBFWA	Page
35034	Fish Behavioral Guidance Through Water Velocity Modification PHASE ONE	Natural Solutions	Fundable	Recommended Action	Agree	72
35035	Incorporating Pit Tag Technology to Evaluate and Monitor the Reintroduction Effort for Anadromous Salmonids in the Upper Cowlitz Watershed	WDFW	Do Not Fund	Recommended Action	Disagree	32
35036	Identify the mechanisms of stranding of juvenile fall chinook salmon in the Hanford Reach	USGS-CRRL; USFWS	Fundable	Urgent*	Agree	52
35037	Measuring the potential for domestication selection of spawn timing in chinook captive and supplementation programs; implications for recovery.	UW and NMFS	Fundable	Recommended Action	Disagree - Higher Priority	47
35038	Develop Computational Fluid Dynamics Model to Predict Total Dissolved Gas Below Spillways	ENSR	Fundable	Do Not Fund	Disagree	57
35039	The influence of hatcheries and their products on the health and physiology of naturally rearing fish	USGS, CRRL	Fundable	High Priority	Agree	47
35040	Determination of post-release survival of spring chinook salmon in a mark-selective sport fishery	PNNL	Do Not Fund	Recommended Action	Disagree	90
35041	Monitoring the reproductive success of naturally spawning hatchery and natural spring chinook salmon in the Wenatchee, Tucannon, and Kalama Rivers	WDFW, NMFS	Fundable	Urgent	Agree	48
35042	Evaluate the Effects of Prey Availability on Recruitment of White Sturgeon in the Columbia River	USGS, CRRL	Fundable	High Priority	Agree	12
35043	Monitoring and Models for Adaptive Management of White Sturgeon	USGS, CRRL	Fundable	Recommended Action	Disagree - Higher Priority	13
35044	Determine Effects of Contaminants on White Sturgeon Reproduction and Parental Transfer of Contaminants to Embryos in the Columbia River Basin	OSU	Fundable	High Priority	Agree	13
35045	Modeling and Information Management System to Assess Effectiveness of Alternative Actions	PNNL	Do Not Fund	Recommended Action	Disagree	83

ProjectID	Title	Sponsor	ISRP Final	CBFWA Category ¹	ISRP Comparison with CBFWA	Page
35046	Estimate juvenile salmon residence in the Columbia River Plume using micro-acoustic transmitters.	NMFS	Fundable (Qualified)	High Priority	Disagree - Higher Priority	26
35047	Evaluate Delayed (Extra) Mortality Associated with Passage of Yearling Chinook Salmon Smolts through Snake River Dams	NMFS	Fundable	High Priority	Agree	68
35048	NWFSC Salmon Data Management, Analysis, and Access for Research Monitoring and Evaluation Programs	NMFS - NWFSC	Do Not Fund (Qualified)	Recommended Action	Disagree	76
35049	A multiscale evaluation of steelhead supplementation in the West Fork Elochoman River	NMFS	Fundable	High Priority	Disagree - Lower Priority	42
35050	UW Offsite Habitat and Fish Survival Effectiveness Monitoring	UW	Do Not Fund	Do Not Fund	Agree	83
35051	Evaluate Feasibility of a System-wide Multi-Agency Fish, Wildlife & Habitat Conservation Enforcement Web-Based Data Center	Steven Vigg & Company	Fundable	Recommended Action	Agree	98
35052	Conservation Enforcement to Enhance and Restore Fish & Wildlife Resources of the Upper Columbia River under Jurisdiction of the Colville Tribes	CCT	Fundable	Urgent	Agree	97
35053	Biological Feasibility of Reintroducing Fishwheels in the Columbia River System	Steward and Assoc.	Do Not Fund	Recommended Action	Disagree	90
35054	Engaging the Public in Watershed Planning; A Tool Box for Cultural Shift	CBFWA	Do Not Fund	Recommended Action	Disagree	103
35055	Role of Bacteria as Indicator Organisms for Watershed Assessment and in Determining Fish Pathogen Relationships with Fauna of Abernathy Creek	USFWS	Do Not Fund	Recommended Action	Disagree	31
35056	Develop Human Resources Necessary to Exercise Co-Management Responsibilities	CRITFC	Do Not Fund	Recommended Action	Disagree	102
35057	Habitat Condition and Restoration Potential of Columbia River Flood Plains: A Critical Missing Element of Fisheries Recovery Science and Policy	UM	Fundable (Qualified)	Recommended Action	Agree	53

ProjectID	Title	Sponsor	ISRP Final	CBFWA Category ¹	ISRP Comparison with CBFWA	Page
35058	Evaluation of food availability and juvenile salmonid growth rates under differing thermal and sediment regimes.	CRITFC	Do Not Fund	Do Not Fund	Agree	60
35059	Rapid Detection of White Sturgeon Iridovirus in Spawning Fluids, Eggs and Juvenile Tissues of White Sturgeon	USFWS	Do Not Fund	Do Not Fund	Agree	15
35060	Instream evaluation of populations, migration, individual adult return and wild-hatchery interactions of naturally produced salmonids	USFWS	Fundable	High Priority	Agree	45
35061	Prophylactic Treatments for White Sturgeon Infected with the White Sturgeon Iridovirus (WSIV)	USFWS	Do Not Fund	Do Not Fund	Agree	15
35062	Impacts of Flow Regulation on Riparian Cottonwood Ecosystems in the Columbia River Basin	Univ. of Idaho	Fundable (Qualified)	High Priority	Disagree - Lower Priority	54
35063	Compare Bacterial Fish Pathogen Populations in Hatchery Water and in Adjacent Creek Water and Evaluate Possible Disease Transfer Between Them.	USFWS	Do Not Fund	Recommended Action	Disagree	45
195505500	Umatilla Tribal Fish & Wildlife Enforcement	CTUIR	Fundable	Urgent	Agree - but 2 FTEs are justified	97
198201301	Coded-Wire Tag Recovery Program	PSMFC	Fundable	Core Program	Agree - but fund statistical position	91
198201302	Annual Stock Assessment - Coded Wire Tag Program (ODFW)	ODFW	Fundable	Core Program	Agree	93
198201304	Annual Stock Assessment - Coded Wire Tag Program (WDFW)	WDFW	Fundable	Core Program	Agree	93
198331900	New Marking and Monitoring Techniques for Fish	NMFS	Fundable	Urgent	Agree	66
198605000	White Sturgeon Mitigation and Restoration in the Columbia and Snake Rivers Upstream from Bonneville Dam	ODFW	Fundable	Urgent	Agree	11
198712700	Smolt Monitoring by Federal and Non-Federal Agencies	PSMFC	Fundable	Core Program	Agree	62
198740100	Assessment of Smolt Condition: Biological and Environmental Interactions	USGS, CRRL	Fundable in Part (Qualified)	High Priority	Agree in Part	46

ProjectID	Title	Sponsor	ISRP Final	CBFWA Category ¹	ISRP Comparison with CBFWA	Page
198810804	StreamNet	PSMFC	Fundable in Part (Qualified)	Core Program	Agree in Part	73
198906201	Fish and Wildlife Program Implementation	CBFWA	Not Applicable	Core Program	Not Applicable	102
198906500	Annual Stock Assessment - CWT (USFWS)	USFWS	Fundable	Core Program	Agree	93
198907201	Independent Scientific Advisory Board Support	DOE/ ORNL	Not Applicable	NWPPC responsibility	Not Applicable	104
198909600	Monitor and evaluate genetic characteristics of supplemented salmon and steelhead	NMFS	Fundable	Urgent	Agree	35
198910700	Statistical Support for Salmonid Survival Studies	UW	Fundable	Do Not Fund	Disagree	70
199007700	Northern Pikeminnow Management Program	PSMFC	Fundable in Part	Urgent	Agree in Part	20
199008000	Columbia Basin Pit Tag Information System	PSMFC	Fundable (Qualified)	Core Program	Agree	64
199009300	Genetic Analysis of Oncorhynchus nerka (modified to include chinook salmon)	U of I	Fundable	Urgent	Agree	42
199105100	Monitoring and Evaluation Statistical Support	UW	Fundable	Do Not Fund	Disagree	70
199105500	Natural Rearing Enhancement Systems (NATURES)	NMFS	Fundable	Urgent	Disagree - Lower Priority	36
199302900	Estimate Survival for the Passage of Juvenile Salmonids Through Dams and Reservoirs of the Lower Snake and Columbia Rivers	NMFS - NWFSC	Fundable	Core Program	Agree	66
199305600	Assessment of Captive Broodstock Technologies	NMFS	Fundable	Urgent	Agree	38
199403300	The Fish Passage Center	PSMFC	Fundable	Core Program	Agree	62
199600500	Independent Scientific Advisory Board	CBFWF	Not Applicable	NWPPC responsibility	Not Applicable	104
199601900	Second-Tier Database Support	UW	Fundable	Do Not Fund	Disagree	75
199602000	Comparative Survival Rate Study (CSS) of Hatchery Pit Tagged Chinook & Comparative Survival Study Oversight Committee	PSMFC & CBFWF	Fundable (Qualified)	Core Program	Agree	63
199602100	Gas bubble disease research and monitoring of juvenile salmonids	USGS, CRRL	Fundable	Core Program	Agree	54
199606700	Manchester Spring Chinook Broodstock Project	NMFS	Fundable	Urgent	Agree	40
199702400	Avian Predation on Juvenile Salmonids in the Lower Columbia River	OSU/ USGS/ CRITFC/ RTR	Fundable	Urgent	Agree	21

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199705900	Securing Habitat Mitigation Sites - Oregon	Oregon Wildlife Caucus	Fundable (Qualified)	Urgent	Agree	10
199800401	Electronic Fish and Wildlife Newsletter	Intermtn. Comm.	Fundable	NWPPC responsibility	Not Applicable	99
199800800	Regional Forum Facilitation Services	NMFS	Fundable (Qualified)	Core Program	Disagree	100
199803100	Implement Wy-Kan-Ush-Mi Wa-Kish-Wit Watershed Assessment and Restoration Plan Now	CRITFC	Fundable (Qualified)	Core Program	Agree	101
199900301	Evaluate Spawning of Fall Chinook and Chum Salmon Just Below the Four Lowermost Mainstem Dams	PSMFC, ODFW, USFWS, PNNL	Fundable	Urgent	Agree	50
200000700	Infrastructure to Complete FDA Registration of Erythromycin	UI-CNR	Fundable	Urgent	Agree	43
200001700	Kelt Reconditioning: A Research Project to Enhance Iteroparity in Columbia Basin Steelhead (<i>Oncorhynchus mykiss</i>)	CRITFC	Fundable	Urgent	Agree	33
200002900	Identification and thermal requirements of larval Pacific, river, and western brook lampreys	USGS, CRRL	Fundable	Urgent	Agree	16
200005200	Upstream migration of Pacific lampreys in the John Day River: behavior, timing, and habitat use	USGS, CRRL	Fundable	High Priority	Agree	17
200005500	Enhanced Conservation Enforcement for Fish & Wildlife, Watersheds of the Nez Perce	NPT-CE	Fundable	Urgent	Agree	96
200005600	Protect Anadromous Salmonids in the Mainstem Corridor	CRITFE	Fundable	Urgent	Agree	95
200100300	ISO Adult Pit Interrogation System Installations	PSMFC	Fundable	Core Program	Agree	65
200100700	Evaluate live capture selective harvest methods for commercial fisheries on the Columbia River 2001-007-00.	ODFW and WDFW	Fundable in Part	Urgent	Agree in Part	84

ISRP Final Review of Fiscal Year 2003 Mainstem and Systemwide Proposals

Introduction

This report contains the final comments and recommendations of the Independent Scientific Review Panel (ISRP) and Peer Review Groups on Mainstem and Systemwide projects submitted for Fiscal Year 2003 funding. A programmatic section identifying crosscutting issues is also provided. The programmatic section is intended to provide useful reference for proponents and the Council in the project selection process. The Mainstem and Systemwide review is the final segment of the rolling review process, which began in the spring of 2000 and covers all projects funded through the Columbia River Basin Fish and Wildlife Program.

The process to review proposals and develop comments and recommendations included several elements. On August 2, 2002, the ISRP released a preliminary review of proposals (ISRP 2002-13; www.nwcouncil.org/library/isrp/isrp2002-13.htm). The preliminary review report was developed in the following steps. Three or more ISRP reviewers were assigned to review each proposal. During the week of July 15th 2002, proponents of each project gave presentations to the ISRP. Each presentation was followed by a question and answer session. Once again, the Columbia Basin Fish and Wildlife Authority and project sponsors provided a well-organized workshop with informative presentations and discussions, which were invaluable in identifying potential issues and clarifying the nature of the proposed projects. On the last day of the presentation workshop, the ISRP met on its own to discuss the proposals and reach consensus preliminary comments and recommendations on each.

With the release of the ISRP's preliminary report, project sponsors were provided several weeks to respond to the ISRP's comments by August 23, 2002. The ISRP received about 78 responses. The ISRP reviewers who had reviewed the original proposal reviewed the response related to that proposal, and the ISRP review teams collectively discussed the responses. The ISRP received Columbia Basin Fish and Wildlife Authority's (CBFWA) Draft FY 2003-2005 Work Plans for the Mainstem and Systemwide on October 24, 2002 (see www.cbfgwa.org), and compared the ISRP review team recommendations with CBFWA's recommendations and comments. Each ISRP recommendation includes a comparison with CBFWA's prioritization and takes into account project sponsor responses to the ISRP's preliminary review.

The CBFWA draft work plan included budget reductions for most proposals in CBFWA's top category (Core Program and Urgent). These reductions were made in consultation with the project sponsors. The ISRP reviewed the project sponsors' comments on the proposed reductions to assess whether the changes compromised the scientific integrity of the proposal. On most proposals, the budget savings involved cost or equipment sharing that did not affect the scientific content of the project. On a few projects, the reductions involved trimming tasks or positions (FTEs) that could affect the soundness of the proposal. The ISRP's final comments on individual proposals include findings on these reductions.

Recommendation Categories

ISRP recommendations and comments are provided for each of the 104 proposals submitted. These recommendations are split into three basic categories: 1) fundable (57 proposals); 2) fundable in part or fundable (qualified) (23 proposals); and 3) do not fund (18 proposals). Four proposals were considered not amenable to the ISRP's technical review, one was withdrawn, and one was combined with another proposal. In addition, ISRP recommendations are provided for two proposals from the estuary provincial review (An Acoustic Tracking Array for Studying Ocean Survival and Movements of Columbia River Salmon, 30007, and Canada-USA Shelf Salmon Survival Study, 30010), which were recommended for deferral to the Mainstem and Systemwide process.

ISRP recommendation categories are based on criteria provided in the 1996 amendment to the Northwest Power Act. The amended Act directs the ISRP to review projects in the context of the Council's program and in regard to whether they:

1. are based on sound science principles;
2. benefit fish and wildlife;
3. have clearly defined objectives and outcomes; and
4. have provisions for monitoring and evaluation of results.

Pursuant to the 1996 amendment, the Council fully considers the ISRP recommendations when making its recommendations regarding funding, and provides an explanation in writing when its recommendations diverge from those of the ISRP.

The ISRP uses "fundable," "not fundable," and variations to summarize the extent to which a proposal meets the ISRP review criteria and to capture the level of ISRP confidence in a proposal. After its Fiscal Year 1999 review, the ISRP began using "fundable" rather than "adequate proposal," because funding recommendations are the common currency between the Council, CBFWA, and BPA. As such, the "fundable" categories enable a ready comparison with CBFWA's recommendations, which is part of the ISRP review.

Fundable is assigned to a proposal that substantially meets each of the ISRP criteria. Each proposal does not have to contain tasks that independently meet each of the criteria but can be an integral part of a program that provides the necessary elements. For example, a habitat restoration proposal may use data from a separate monitoring and evaluation proposal to measure results. The proposal must demonstrate this integration. Some "fundable" proposals may require minor clarifications and adjustments to methods and objectives by the sponsor in consultation with the Council and BPA in the final project selection process. "Fundable" is not an ISRP endorsement to fund the project or an opinion on the proposal's priority.

Fundable in Part is assigned to a proposal that includes work that is scientifically supported, but also work that is not. In this case, the ISRP specifies the objectives or tasks that are not scientifically sound and recommends that these parts of the proposal not be funded. Examples are proposals that include objectives that are not scientifically supported, for instance a proposal for concurrent background assessment work and on-the-ground implementation that could not be supported before results of the assessment were known, and proposals that include use of unsound methods to meet a particular objective.

Not Fundable is assigned to a proposal that is significantly deficient in one or more of the ISRP review criteria. One example is a research proposal that is technically sound but does not offer benefits to fish and wildlife because it substantially duplicates past efforts and does not offer new insights. Another example is a proposal for an ongoing project that may offer benefits to fish but does not include provisions for monitoring and evaluation or report past results. Usually a deficiency in one area is a symptom of overall deficiency in the proposal. In most cases, proposals that receive “Not Fundable” recommendations lack detailed methods, provision for monitoring and evaluation, or have the potential for deleterious effects on native populations. The ISRP notes that numerous projects rated “not fundable” propose needed actions or are an integral part of a watershed effort, but the proposed methods, tasks or objectives are not scientifically sound. ISRP comments are intended to indicate areas where serious remedial effort, such as significant revision and review, is needed before funding. In some cases, an RFP is warranted to address the needed action.

Within these categories, some recommendations are “qualified,” meaning that the proposal needs to meet certain conditions or address outstanding concerns before the project is funded. Some of these conditions may call for additional ISRP review, but most require minor clarifications and adjustments to methods and objectives by the sponsor in consultation with the Council and BPA in the final project selection process.

ISRP comments also include observations on budgetary, *in lieu*, and other issues that are not central to the scientific review. These observations do not dictate whether a project will receive a “fundable” or “not fundable” recommendation. Instead, these comments are intended to flag issues for the Council, BPA, CBFWA, and the public that require further inquiry.

Programmatic Issues

The programmatic issues identified below are those that are relevant to Council decisions on mainstem and systemwide proposals. The ISRP is drafting a Retrospective Report to be issued in early 2003 that will include an examination and synthesis of overarching programmatic issues identified in the past five years of ISRP review. The ISRP is especially interested in providing feedback on this first round of rolling reviews and making recommendations about the future review process.

Research, Monitoring, and Evaluation

The Bonneville Power Administration (BPA), in coordination with the National Marine Fisheries Service and the Council, added an important new element to the review process for the Mainstem and Systemwide. The revised process includes a front-end review of projects by the Research, Monitoring, and Evaluation (RME) group, comprising scientists from the Action Agencies and NMFS. The solicitation placed emphasis on projects that would meet the Action Agencies’ responsibilities under the National Marine Fisheries Services’ FCRPS 2000 Hydro Biological Opinion (BiOp), especially those responsibilities associated with Reasonable and Prudent Alternative (RPA) actions 179-199. The purpose of the RME group review was to provide some preliminary information to the ISRP and project sponsors on the ability of proposals to meet the RME needs identified in the Biological Opinion, or as further defined by the RME group. The process is intended to aid in the development, selection, and funding of a suite of integrated projects that will meet the intent of BiOp RPA actions in the most effective and economic way.

The RME group identified a set of proposals (43 of the 104 submitted) that potentially addressed implementation of the RME BiOp RPA action items. For these proposals, the RME group provided written comments on the extent to which the proposed project would meet the RME requirements of the BiOp. Some of the comments identified shortcomings in the proposal relative to BiOp requirements and proposed modifications to more directly meet the intentions of the RPA actions. The RME group comments were first released to the ISRP and the project sponsors during the week of July 22 and were included in the ISRP's preliminary report for the relevant proposals following the ISRP comments.

There was some initial concern that the RME group and the ISRP would provide inconsistent comments requesting divergent approaches from the project sponsors in the response loop. Consequently, the ISRP agreed to review the RME group comments for consistency with the ISRP review team comments. In the preliminary report, the ISRP remarked on the RME group comments on the 43 projects reviewed by the RME group. For the most part, the ISRP and RME group comments were consistent or addressed different criteria and were not in disagreement.

Summary of ISRP and RME review process and findings:

1. Adequacy. Most project sponsors adequately addressed the initial RME concerns; subsequent RME comments acknowledged this. See the RME group comments at: www.cbfwa.org/files/province/systemwide.
2. Consistency. RME comments were generally helpful and consistent with ISRP comments, with the exception of the initial comment on the Coded Wire Tagging (CWT) program. However, some members of the RME group are also project sponsors, leading to a potential for conflicts of interest. Conduct of the RPA review by the ISRP would realize a lowered likelihood of conflicts of interest as well as cost savings. An RPA review by the ISRP would require some education of ISRP and PRG members on the specifics of RPA and BiOp needs, if more scrutiny of those are needed in ISRP comments than is implicitly given (e.g., most projects state they meet an RPA need).
3. Iterative Fix-it Loop. The ISRP found some proposals designed to meet RPA/RME needs technically inadequate. However, according to RME Group comments, some of these proposals, once reworked, were critical components of their plans to meet RPA needs. This raises a process issue of whether to revise proposals until they meet ISRP criteria and RME needs or to solicit another RFP. Does the Council make an exception to established process for proposals because of the perceived BiOp priority and timeline? There is a fairness issue associated with such iterative "fix-it" reviews for these particular projects, given the single pass through of the fix-it loop for other FWP proposals under ISRP review.
4. Conflict of Interest. Because NMFS authors the BiOp and RPAs, there is significant potential for conflict of interest when the RME group, whose membership includes NMFS, makes RPA and RME recommendations on NMFS' and competing proposals. This internal review is analogous to the CBFWA review of its own members' projects, which at times are specified as measures in the Fish and Wildlife Program. One of the reasons Congress created the ISRP through the 1996 amendment to the Power Act was to provide an independent check against this inherent conflict of interest. The potential for conflict of interest with NMFS is particularly acute given the threat of ESA non-compliance. There is no question that NMFS Northwest Fisheries Science Center has a capable scientific staff that is necessary to recovery implementation and monitoring. However, like other proposals funded under the Council's Fish and Wildlife Program,

proposals selected to meet RME/RPA needs should meet the scientific criteria of the ISRP's independent review.

5. Coordinated Research Monitoring Effectiveness. The larger issue of a coordinated RME looms as a result of a positive ISRP review of the CBFWA proposal and the apparent interest of ownership of the RME process by the Action Agencies. From the ISRP comments on proposal # 35033, it appears that this proposal is in direct competition with the planned activities of the Action Agency/NMFS RME Group. Competition between the RME Group, currently funded by BPA, and the Collaborative Systemwide Monitoring and Evaluation Program (CSMEP) project (#35033), proposed by CBFWA and recommended by the ISRP, is a problem to be resolved in the political arena. We emphasize that resolution of this competition and development of a coordinated Columbia Basin-wide monitoring program is critical for collection of the best quantity and quality of scientific data that will have the greatest utility to the region in the evaluation of efforts to recover fish and wildlife habitat and populations.

The CBFWA proposal #35033 addresses one of the major management deficiencies in the basin, namely the lack of a coordinated basin-wide monitoring program. This project provides an urgently needed umbrella framework to: 1) collaboratively develop systemwide M&E protocols; and 2) coordinate data collection activities, protocols, and standards. The basic objective of the CSMEP project is to provide a coordinating mechanism for individual M&E projects rather than assuming all M&E activities into itself.

It was refreshing to see in the NMFS Proposal #35019 (*Develop and Implement a Pilot Status and Trend Monitoring Program for Salmonids and their Habitat in the Wenatchee and Grande Ronde River Basins*) that one of the Action Agencies agrees with the ISRP that the CBFWA proposal #35033 contains the necessary collaborative components to implement a comprehensive monitoring program basinwide. We note that NMFS is also an active member of CBFWA. Proposals #35033 and #35019 (and by extension, parts of the other NMFS proposals #35016, #35020 and #35048) could be combined with other ongoing projects to provide a systemwide monitoring and evaluation project. The ISRP strongly agrees with the statement in the NMFS proposal #35019 that:

“The absolutely essential elements of 35033 that the other projects lack is the basinwide perspective, both in the collaborative representation of nearly all fisheries management agencies, as well as the inclusion of fishes other than anadromous salmonids. Ultimately, the most efficient manner for the Columbia River basin to approach a comprehensive monitoring program would be in the form of integrated aquatic ecosystem health assessment. Components of the above 5 projects, plus many ongoing monitoring programs, if coordinated within a single purpose, design, and data management and evaluation framework, could produce the ideal monitoring program for the basin’s aquatic natural resources.”

Technical deficiencies or incomplete methods in NMFS proposals #35016, #35020 and #35048 and the ISRP prevent the ISRP from giving them unqualified support for funding.

The CBFWA proposal #35033 is broader, both in scope and participation, than other M&E projects proposed in the systemwide province and, therefore, has a higher probability of success and should receive priority for immediate funding. The CSMEP project provides an environment for developing and coordinating common data collection protocols and standards. Several logistical and institutional issues remain to be resolved,

but the ISRP believes that this proposal has the best potential to significantly improve the quantity, quality, and utility of scientific data for evaluation of fish and wildlife recovery efforts in the Basin.

Finally, to emphasize the urgent need for a basinwide coordinated monitoring system, the ISRP added the following recommendation to about 75% of the proposal reviews: "If funded, this project should be coordinated with other monitoring projects to ensure compatibility of objectives, common methods and protocols. This coordination could be accomplished under the favorably reviewed CBFWA proposal #35033."

Measure Smolt Survival Directly

Various scientists in the region, in particular scientists from the Comparative Survival Study project and NMFS, have considered the problems in estimating the LGD to LGD smolt-to-adult survival rates (SARs) from currently available data and have apparently arrived at what they consider to be the "best" formulas. Unfortunately, the formulas are complicated, convoluted, and in general, very unsatisfactory from a statistical point of view. Accordingly, there is high probability that these methods will continue to spawn arguments and counter-arguments over trivial issues that will occupy the resources of the region, because the stakes are high; e.g., high costs of spill, high costs of transportation, unknown long term effects of the non-normative transportation, high costs of flow augmentation, etc.

The long-term solutions to the mathematical and statistical problems in estimation of smolt-to-adult return rates (Bonneville to Bonneville and Bonneville to Low Granite SARs) appear to be: 1) detection of sufficient numbers of PIT tagged juveniles passing Bonneville No. 2 Dam at the planned corner collector; 2) estimates of mortality of fish passing via that route; 3) and/or sufficiently large sample sizes of PIT tagged fish downstream of Bonneville. The ISRP recommends that these sampling efforts for PIT tagged juveniles be given high priority by the Council and the Corps of Engineers. In particular, Task 2 of NMFS proposal #198331900 for development of PIT tag detection in the corner collector at Bonneville No. 2 Dam should be given high priority.

Hanford Reach Stranding

The proposal "Identify the Mechanisms of Stranding of Juvenile Fall Chinook Salmon in the Hanford Reach," #35036, raised the issue of the adequacy of the amended Vernita Bar Agreement of February 25th 2002, in protecting juvenile salmonids from stranding. The Council and NMFS' Independent Scientific Advisory Board has a particular interest in this stranding issue (ISAB 99-5) and in 1999 recommended to the Council that a revision of the Vernita Bar Agreement be adopted to extend protection to emigrating fry. We understand that Grant County P.U.D. led in the development of a revised agreement among all of the (numerous) affected parties in 1999. In addition to Fish and Wildlife Program funded studies, Grant County P.U.D. continues to monitor fall chinook at Vernita Bar during spawning, incubation, fry emergence, and now fry emigration.

While the amended Vernita Bar Agreement is well intended and represents a step forward in protecting recently emerged fall chinook that have not yet moved out of the area, it contains loopholes that lead to less than desirable levels of protection. The loss of an estimated 2 million juvenile fall chinook in spring 2001 is an illustration of this point. At least two problems in the amended agreement are pointed out in the response to ISRP comments provided by the

proponents of proposal #35036. First, the agreement specifies permissible fluctuations in flow under various river flow scenarios, but the frequency, duration, and rapidity of fluctuations are not adequately specified. Second, the provisions are not derived from field observations that indicate whether they would prevent mortality of fish. In practice the major changes in flow brought about by load following typically occur between 11 PM and 5 AM. By the time field crews arrive on the river in the morning, flows have increased and any dead fish have been washed down the river. The Vernita Bar Agreement should be modified to correct the problems with flow specifications, and field monitoring should be modified to include nighttime observations.

Proposal #35036 focuses on “mechanisms” that might be involved in stranding of juvenile chinook in the Hanford Reach, and puts an emphasis on behavioral mechanisms of the fish that might affect rates of stranding. The study would provide useful information to the potential revision of the Vernita Bar Agreement. The ISRP agrees with CBFWA that implementation of proposal #35036 is urgent.

Gas Bubble Disease

It appears that after ten years of gas bubble disease research and development, the question of how much monitoring and evaluation is needed in the future needs complete examination. If the Council calls for an independent review, the review could address the following topics and questions regarding the causes of total dissolved gas and the monitoring of gas bubble disease:

1. A status report on the USACE construction of total dissolved gas mitigation on all federal dams, primarily in the form of “flip lip” spillways. Where have they been installed? How have those functioned and what is the total dissolved gas duration curve at each dam under various flow and spill scenarios?
2. FCRPS models indicate that spill can be controlled in most years through storage operations, and spill in recent years is largely voluntary (defined to include spill required by the Council and/or the BiOp of NMFS). Models exist that predict the amount of total dissolved gas expected for various flow/spill scenarios and flood conditions. If those analyses show that the total dissolved gas limit permitted by variances issued by state water quality authorities (120 % saturation) is highly unlikely to be violated, then this might be evidence to eliminate or modify the gas bubble disease monitoring program. Do the models have good enough calibration to be dependable?
3. The risk of gas bubble disease to the population of juvenile migrants is primarily contingent upon the various passage strategies employed -- transportation, spill, bypass, etc. The gas bubble disease program should be keyed into regional plans for the use of transportation and in-river migration paths.
4. Total dissolved gas levels of up to 120% appear to be an acceptable level of risk to salmonids given potential benefits of spillway passage across dams. Thus, the need to maintain 110%, the previous water quality standard, should be re-examined for Columbia and Snake River dams. A critical component of this re-examination would be to monitor the effects of gas bubble disease at 120% on resident fish species and other biota. Proposal #35013 deals with the resident fish issue.
5. During floods and emergency outages (load rejection), total dissolved gas may rise unexpectedly and cause high levels of gas bubble disease even with “flip lips” or other

engineering devices in place. Is it feasible to develop a gas bubble disease SWAT team for limited specific duty? For example, in years when high flows are anticipated, uncontrolled spill and total dissolved gases are expected to rise above 130%. This can be modeled ahead of the event. Although the Corps could maximize transportation, current JBS capture efficiency will decline on the rising limb of the hydrograph due to the fact that juvenile salmonids will be diverted into spill, exposing higher numbers of migrants to high total dissolved gas. During emergencies, or future anticipated flood conditions, the agencies could maintain a capability to sample for gas bubble disease on short notice by mobilizing expertise to a specific site for a specific problem.

Conservation Enforcement

Conservation enforcement programs are conducted by many different entities in the Columbia River Basin. These programs and their activities are similar enough in objectives and data needs that additional benefits could be generated through their explicit coordination. The ISRP recommends that a targeted RFP be developed to assess the efficacy of conservation enforcement in the Columbia Basin, to identify strengths, weaknesses, and opportunities for improvement. The assessment should develop performance measures that would apply across programs and would inform operational adaptive management. Opportunities for coordinated data collection and analyses should also be identified.

NATURES Rearing and Captive Broodstock Research

The region is investing significant resources into testing and implementing new and reformed protocols in the artificial production arena. One area of research involves the evaluation of NATURES effects (i.e., the semi-natural rearing of fish in hatcheries) on salmonid behavior, morphology, physiology, and post release survival of hatchery fish as well as their ecological interactions with wild fish. This technique is being employed in both supplementation (e.g., Cle Elum and the Nez Perce Tribal Hatchery) and captive broodstock approaches.

NATURES-rearing Research

The primary research proposal for the NATURES rearing effort is NMFS' proposal # 199105500 (*Natural Rearing Enhancement Systems (NATURES)*). The ISRP has reviewed this proposal numerous times over the last two years, including an extended review and response loop. The proposal has two major foci, to test NATURES rearing-habitat components at production hatchery scale and determine interaction effects between rearing-habitat variables assessed based on smolt-to-adult survival, and to investigate benefits of predator conditioning to juvenile migratory and adult survival. This research program, which is designed to provide answers to uncertainties about NATURES effects but requires 8-10 years for results, is being superseded by the current implementation of NATURES rearing approaches to supplementation in the Yakima and Clearwater systems. This raises the larger question of whether supporting the NMFS' NATURES proposed project is still warranted given issues of best use of funds, the expected modest gains from this investment, and the information that will be available near term from other application of the NATURES rearing approach within (e.g., Cle Elum) and outside (Puget Sound) the basin. The proposed value of this specific project was a production-scale test of the NATURES rearing approach conducted within a rigorous experimental design. Implementation of NATURES rearing approaches to supplementation in the Yakima and Clearwater systems are in fact now applying NATURES at production scales but don't involve the rigorous statistical design developed by NMFS.

In making a final determination on NATURES-rearing, Council should be advised that the NMFS' NATURES proposal is a well-designed experimental assessment of NATURES treatments intended to inform subsequent application of the NATURES approach to supplementation and production programs. While implementation of NATURES rearing treatments in the Basin has preceded this experiment, this study could still improve the efficiency of those applications. However, there is general regional agreement that the relative benefits of NATURES rearing alone are likely to be relatively small.

Captive Broodstock Research

The primary research proposal for the assessment of captive broodstock technology in the basin is NMFS' proposal # 199305600 (*Assessment of Captive Broodstock Technologies*). The ISRP has reviewed this proposal previously and recommended a more integrated approach, which the current proposal provides. The proposal continues the development of technologies to improve genetic integrity, in-culture survival, maturation, and reintroduction success of ESA-listed salmon captive brood stocks. Research is conducted on physiology, behavior, genetics, ecology, microbiology, and nutrition and the captive brood fish and their re-introduction to the natural environments. Nevertheless, the ISRP has several concerns with this large complex project. While the proposal is a substantial improvement over its predecessor, it is very large and needs clarification or restructuring so that the individual studies can be thoroughly reviewed. The ISRP was unable, within the confines and time restraints of the provincial review process, to provide as in-depth a review of the set of related tasks or sub-projects, as they deserve. The scope of this program and importance of the work to the conservation of these stocks might justify a more in-depth scientific review of this one project alone (not as one of 104 projects in this review) or in the context of basinwide captive broodstock efforts.

The NMFS project is one in a set of about nine ongoing basin projects using captive broodstock technology, and the ISRP is aware of the Council's Conditional Approval of Captive Propagation Projects as specified in an April 28, 2002 letter from Mark Fritsch to captive broodstock project sponsors. This letter captures the ISRP's previous programmatic concerns and provides an approach to review the captive broodstock program as a whole. The information gained in the review will inform the Council's Artificial Production/Review and Evaluation (APRE). The ISRP is open to participating in a more in-depth review of the regional captive broodstock program or providing input on review elements. This task could be undertaken by the ISRP in the immediate future during the interim between this provincial review process (now ending) and the next one, which is tentatively scheduled to begin no sooner than late 2003 and likely 2004. The ISRP notes that the Council letter misses two critical issues for captive brood as a recovery tool: how to get the progeny back into the natural environment and what is the fitness of the progeny in the wild? The ISRP had particularly significant concerns about current attempts at re-introduction and the policy of outplanting captive-bred adults as a reintroduction strategy.

ISRP Final Comments and Recommendations on Each Proposal

Proposals are arranged by topic area, project sponsor, and project ID. Topic areas are listed in the following order: Wildlife, Lamprey, Avian and Fish Predation of Juvenile Salmonids, Estuary/Plume and Lower Columbia, Artificial Production Related, Mainstem Habitat, Water Quality, Juvenile and Adult Fish Passage, Data Management, Monitoring and Evaluation: Systemwide and Habitat Action Effectiveness, Harvest, Coded Wire Tag Monitoring Program, Conservation Enforcement, and Fish and Wildlife Program Coordination, Analysis, and Communication. See the table of contents for page starts of topic areas and the index of proposals for the page that specific proposal comments are on.

Wildlife

ProjectID: 199705900

Securing Habitat Mitigation Sites - Oregon

Sponsor: Oregon Wildlife Caucus

FY03 Request: \$4,043,000 **5YR Estimate:** \$23,000,731

CBFWA Adjusted FY03: \$2,153,000 **3YR:** \$10,383,992

Short Description: Protect, restore, enhance, and maintain NWPPC target habitat types and associated species in all Oregon subbasins within the Columbia River Basin to mitigate for impacts caused by hydroelectric facilities.

ISRP Final Comments:

Fundable (Qualified); the monitoring and evaluation plan needs to be further developed. Agree with CBFWA's "urgent" recommendation. The proposed budget reductions seem reasonable, although the ISRP performed only a cursory review of the budget changes.

This project continues to be a good example of an umbrella proposal for acquisition of land to satisfy mitigation requirements of BPA. This proposal describes Oregon mitigation activities related to coordination and planning between Oregon wildlife managers and the implementation of projects. It contains a general description of the approach to mitigate for Habitat Units (HUs) lost as a result of the construction and operation of the Columbia Basin hydropower system. Oregon acquires wildlife mitigation sites according to a prioritized list following well-formulated criteria. Criteria used to rank sites are listed.

The proponents comment that they have already adopted portions of the Draft M&E Plan for the Albeni Falls Wildlife project to use in similar cover types found at the Burlington Bottoms and Ladd Marsh, WA Addition project sites. They propose to use the M&E Plan for the Albeni Falls Wildlife Mitigation project as a template for the Oregon M&E plan and state that ties will be made to national databases as well. However, the M&E program is not presented in the proposal. The proponents should have included and more completely developed the plans for monitoring and evaluation that were developed by the Albeni Falls Workgroup and reviewed by the ISRP in the addendum to report ISRP 2001-4 "Review of Draft Albeni Falls M&E Plan."

The ISRP notes that a similar effort to expand the Albeni Falls Wildlife monitoring plan, which is more appropriate for riparian habitat, to upland and more terrestrial wildlife habitat is underway

in the Upper and Middle Snake Province. We suggest that the proponents of this project contact the IDFG, e.g., Project 199505701 in the Upper and Middle Snake Province, and continue to work to ensure that common and compatible methods are developed within the Columbia Basin for M&E (also see CBFWA proposal 35033).

The proposal is clearly connected to regional programs and to other habitat acquisition and restoration projects. However, given the current importance of the BiOp to FWP funding, it would help this proposal to include the specific RPAs that the proposed habitat projects might address.

White Sturgeon

ProjectID: 198605000

White Sturgeon Mitigation and Restoration in the Columbia and Snake Rivers Upstream from Bonneville Dam

Sponsor: ODFW

FY03 Request: \$2,041,140

5YR Estimate: \$10,248,476

CBFWA Adjusted FY03: \$1,984,000

3YR: \$6,191,029

Short Description: Restore and mitigate for hydrosystem-caused loss of white sturgeon productivity through intensive fisheries management, supplementation, and modified hydropower system operation. Assess success of mitigation and restoration efforts.

ISRP Final Comments:

Fundable. We agree with CBFWA's designation of the project as urgent. This proposal represents a culmination of nearly ten years of work on white sturgeon biology and management in the Columbia River reservoirs. The project has progressed logically from research on the population status, life history, and habitat requirements of sturgeon through development and implementation of mitigation, management, and monitoring actions based on the research. The accomplishments of the project to date are documented in the proposal (pages 9-11) and in the draft White Sturgeon Program Summary dated February 22, 2002. The researchers have also published numerous papers in well-respected, peer-reviewed fisheries journals (pages 17-19). The proposal lays out a clear description of accomplishments to date and provides a logical plan for completing the research objectives, evaluating mitigation actions, and monitoring population status through 2005. Long-term goals beyond 2005 are not presented.

In the 2000 review of this project, the ISRP recommended that the sponsors develop an umbrella proposal for all sturgeon research in the basin and a long-term strategy and plan indicating how the sponsors are moving toward their objectives. The draft Program Summary appears to fulfill this recommendation. However, the ISRP also called for a peer-reviewed synthesis of the state of the science on Columbia River white sturgeon. This is a highly desirable activity that still needs to be conducted. We do note, however, that the sponsors have published numerous peer-reviewed journal articles and are contributing two chapters to a book on North American sturgeon.

The sponsors provided satisfactory and detailed answers to the ISRP's questions. The sponsors have expanded cooperative efforts on sturgeon research and management to include a workshop for more than 50 sturgeon biologists and interested scientists from throughout the Basin and are working on establishing a web space and list-server that will allow sturgeon biologists from throughout the Basin to form working groups and contribute to the synthesis.

ProjectID: 35042

Evaluate the Effects of Prey Availability on Recruitment of White Sturgeon in the Columbia River

Sponsor: USGS, CRRL

FY03 Request: \$248,445 **5YR Estimate:** \$1,295,445

Short Description: Ascertain how forage influences recruitment by investigating the influence of food deprivation at the onset of exogenous feeding, compare prey availability among areas with differing recruitment, and determine growth rate potential among areas.

ISRP Final Comments:

Fundable. We agree with CBFWA's designation of the project as high priority. This is a research proposal to investigate the influence of early feeding and food availability on survival and growth of juvenile white sturgeon (under the premise that juvenile survival establishes recruitment). The research would include laboratory studies of feeding behavior at the time feeding begins and shortly thereafter and survival/growth studies under starvation and various feeding levels. Prey availability in the field would be compared among three Columbia River zones with contrasting white sturgeon recruitment to see if differing prey availability matches differing recruitment: Lower Columbia (good recruitment), John Day pool (moderate and variable recruitment), and the Priest Rapids Dam pool (poor to no recruitment). A white sturgeon bioenergetic growth model would be constructed that would include spatial differences in order to predict the growth potential for juvenile white sturgeon throughout the region (where food availability information is available). The proposal recognizes that BPA's long-standing white sturgeon project (198605000) has moved away from research and into implementation, as was planned in the early 1980s. Thus, further research requires a new project.

This well-written proposal meets ISRP review criteria. The background section provides a scientifically sound rationale for the work, with abundant citations of relevant papers. There is an excellent discussion of regional rationale and significance of the proposed research, with citations and discussion of the goals of the Action Agencies' 5-year Implementation Plan for listed species, the Council's Fish and Wildlife Program (with which the proposal is consistent), and the white sturgeon program summary for the Mainstem/Systemwide province. Other white sturgeon projects are discussed including those funded by BPA in the basin and Canada and by non-federal organizations in the basin. The need for a new research project is persuasively presented, based on the planned evolution of the main BPA project (198605000) to implementation of management strategies designed to compensate for poor natural recruitment in much of the basin. The objectives, tasks, and methods are presented clearly and completely. The staff is well qualified. The research is one of monitoring and evaluation, and thus no separate function is needed (although this might have been discussed). A minor criticism of the proposal is its emphasis on main channel ecology, whereas the ISG in Return to the River indicated that off-channel and riparian habitats may be especially important for food production and juvenile feeding (the development of riparian vegetation also follows a gradient paralleling white sturgeon recruitment, with high and nearly normative conditions in the lower Columbia and little, if any, riparian development in Priest Rapids pool).

ProjectID: 35043

Monitoring and Models for Adaptive Management of White Sturgeon

Sponsor: USGS, CRRL

FY03 Request: \$176,000 **5YR Estimate:** \$626,000

Short Description: Develop a quantitative tool for adaptive management that allows feedback from monitoring data and adjust policies related to harvest translocation, and stocking.

ISRP Final Comments:

Fundable. We place greater priority on funding this project than the funding priority inferred from CBFWA's designation of the project as a recommended action. No response was requested. This is a worthwhile project with well-qualified investigators. The project provides a much needed modeling component to complement sturgeon research and management in the basin. The model would be a refinement and expansion of the Snake River model developed by the principal investigator. This project builds upon the Snake River study funded by EPRI and Idaho Power. The project plans to integrate basinwide sturgeon information, and then to develop a Columbia River basin model (including building in supplementation efforts). The model will then be used to identify adaptive policies. The plan is to use the model and simulations to identify critical uncertainties. Management decisions or actions that could come out of the model simulations might include migration (transplants, upstream passage of adults), supplementation (population augmentation via hatchery technology), harvest, etc.

ProjectID: 35044

Determine Effects of Contaminants on White Sturgeon Reproduction and Parental Transfer of Contaminants to Embryos in the Columbia River Basin

Sponsor: OSU

FY03 Request: \$652,376 **5YR Estimate:** \$1,755,005

Short Description: Determine contaminant load in mature sturgeon and the effects of parental transfer of contaminants on non-specific immune factors and offspring fitness. Develop a nondestructive tool to monitor sturgeon contaminant load.

ISRP Final Comments:

Fundable. We agree with CBFWA's designation of the project as high priority. This is a research project to test the hypothesis that contaminant loading, particularly of reproductive tissue, is a major factor in poor recruitment of white sturgeon in the Columbia River basin. If it is, then mitigative measures could be taken to lessen contaminant loading of the environment, with benefits to recruitment of white sturgeon. The project would sample adult white sturgeon at several sites in the basin ranging from the tributaries (e.g., Kootenai River) to the lower mainstem (in collaboration with other studies) and assay them for a range of potential contaminants and contaminant-indicating physiological parameters. A non-invasive method of assay would be developed (most likely a blood analysis) although initial assays would be destructive. Eggs and sperm would also be assayed to quantify transfer of contaminants and parentally derived immune factors (that might be lower from contaminated adults) to young. The developmental survival and fitness of young would be determined and related to parental contaminant load. Exposures of fish in the laboratory to selected contaminants would establish dose-response relationships for uptake and certain other effects.

The proposal is exhaustively thorough in both background and tasks/methods, with a long list of cited references. The proposal is clearly based on sound contaminant science. Consistency with the Council's Fish and Wildlife Program is well demonstrated, as is relevance to regional

programs such as the Action Agencies' Implementation Plan and the Mainstem/Systemwide program summary for white sturgeon. There are clearly defined objectives with anticipated outcomes, and appropriate tasks and methods for each. The project is presented as a monitoring and evaluation project, so no explicit discussion of that ISRP criterion is given (although it would have been helpful).

The response adequately and persuasively explained the distribution of contaminant sources in the basin and the resulting implications for white sturgeon and for the research that is proposed. The potential biological significance of contaminant levels was well presented. Contaminants remain high on the list of potential contributors to poor recruitment of white sturgeon and deserve to receive the attention proposed in this study.

A key issue for management remains: What can we do about positive results? If we hold the line on further contamination, will nature heal this problem? Should we be concentrating on hot spot removal (Superfund)? Could contaminated sediments used by sturgeon be buried by clean sediment? These questions are not answerable at this time without results from the research, but should guide the perspective of the study.

ProjectID: 35028

Evaluate White Sturgeon Nutritional Needs & Contaminant Effects Influenced by the Hydroelectric System

Sponsor: PSU

FY03 Request: \$456,241 **5YR Estimate:** \$1,064,326

Short Description: Evaluate the effects of the hydroelectric system on white sturgeon nutritional needs and contaminant effects that would be used in white sturgeon management decisions for the mitigation and restoration of Columbia River white sturgeon populations.

ISRP Final Comments:

Fundable at a low priority. We agree with the CBFWA review and "Recommended Action" ranking. This is a basic research study to try to unravel the mystery of why white sturgeon recruitment is low to non-existent in Columbia River reservoirs. Earlier studies have indicated potential impacts of certain contaminants on fish condition and certain physiological indicators that could suggest adverse effects on growth and reproduction of white sturgeon in Bonneville Pool. The proposal seeks to build upon this work by determining if food consumed by sturgeon is meeting their nutritional needs and if immature fish are being adversely affected by contaminants, particularly in their food.

This thorough proposal generally meets the ISRP review criteria, although there were several technical questions that needed elaboration. The response elaborated, but did little to clarify the ISRP's questions. The ISRP requested a better justification of the ecological consequences of the research if it is to be useful to managers.

The topic is of regional interest, and the proposal shows how it is included in the FWP, Action Agencies' Implementation Plan, Mainstem Solicitation, and the Sturgeon Program Summary. The background section gives up-to-date details of prior work on the subject, including data. The objectives and tasks are fairly clear, and the planned methods (including sample sizes) are laid out in detail. There is a qualified staff, and they have demonstrated their capability to do the work with prior studies funded elsewhere. The study is highly contaminant oriented, and food and feeding are given attention mainly through analysis of stomach contents. There might have been a more ecological flavor.

There are two general difficulties with this sort of work. First, knowing with some certainty that changes in physiological and biochemical indicators will translate into biologically meaningful reductions in growth and reproduction and second, knowing with some certainty that the changes in physiological and biochemical indices that are observed are a direct consequence of exposure to contaminants and not a result of some other environmental factors (e.g., changes in flow regime, temperature) or a density-related phenomenon. The response did little to assuage our concerns on these points.

Overall, most of the methods lack sufficient conceptual detail to convince a reviewer that the research will accomplish what it proposes. It is unclear how much new knowledge relevant to restoration and protection of sturgeon will be generated by this research beyond what is already known from past studies.

ProjectID: 35059

Rapid Detection of White Sturgeon Iridovirus in Spawning Fluids, Eggs and Juvenile Tissues of White Sturgeon

Sponsor: USFWS

FY03 Request: \$97,452

5YR Estimate: \$191,306

Short Description: Develop a rapid nested PCR assay for the detection of White Sturgeon Iridovirus from reproductive fluids, eggs and tissues of infected fish. Utilize the assay to determine viral prevalence and geographic distribution within the Columbia River Basin.

ISRP Final Comments:

Do Not Fund; agree with CBFWA. The proposal is technically inadequate. It lacks clarity and adequate methodological detail and has poorly stated objectives (just a list of tasks). The real objective of determining the prevalence of the virus in the basin was given in the narrative of background. The principal investigator's brief CV and listed references suggest competence in the development and application of genetic-based disease assays, but neither the proposal nor the presentation provided adequate detail on laboratory or genetic assay methods to provide reviewers confidence that the project's goals are likely to be realized. The principal investigator talked about PCR as a new technique. While PCR has clearly revolutionized many genetic-based analyses, it has been around for nearly a decade and is routine business in any genetic laboratory. The principal investigator could have shown slides that quickly and clearly showed the non-geneticists in the audience how PCR worked, how primer sets are generated for new applications, and how the presence / absence ELIZA-type tests are performed.

ProjectID: 35061

Prophylactic Treatments for White Sturgeon Infected with the White Sturgeon Iridovirus (WSIV)

Sponsor: USFWS

FY03 Request: \$69,681

5YR Estimate: \$127,661

Short Description: This project looks at a number of different prophylactic treatments targeting secondary pathogens found in outbreaks of the White Sturgeon Iridovirus in order to minimize total mortalities.

ISRP Final Comments:

Do Not Fund; agree with CBFWA. The proposal is inadequate. This is a very short proposal to do routine screening of prophylactics for their efficacy in treating secondary bacterial and fungal

infections of white sturgeon undergoing effects of a viral infection. Such checking of prophylactics doesn't seem to be cutting edge research. The prophylactics are commonly used on other fish for similar infections. No literature documentation is provided for this common practice.

Lamprey

ProjectID: 35008

Systemwide Lamprey Program Coordinator

Sponsor: USGS, CRRL

FY03 Request: \$111,370 **5YR Estimate:** \$496,774

Short Description: Provide coordination for the Lamprey Technical Working Group

ISRP Final Comments:

Fundable in part. We disagree with CBFWA's high priority designation of the project. The response was not adequate. The ISRP does not recommend funding of the Lamprey Coordinator position, but does recommend funding support for an annual workshop that would allow biologists from throughout the basin to meet, review projects, and coordinate work.

The ISRP favors coordination among lamprey projects, but the sponsors need to better justify why a formal, funded coordinator position is necessary and if the approach presented in the proposal is generally supported by lamprey researchers and managers throughout the basin. One coordination task that is not specified in the proposal is integrated, basinwide planning of lamprey research and restoration projects. This would seem an appropriate task for a Coordinator position. However, the sponsor's response did not answer our questions; rather it merely commented on our comments. The absence of letters of support from the lamprey researchers demonstrating their support for the proposal, especially for the USGS as lead, may indicate a lack of support for a coordinator or for this agency as the lead.

The draft Columbia River Lamprey Program Summary (February 22, 2002) appears to address many of the ISRP's concerns about program level coordination. The Program Summary lists all ongoing lamprey research, describes how projects are interrelated and coordinated, and identifies critically needed research projects, major uncertainties, and future management actions. The Program Summary specifically addresses concerns raised by the ISRP during its review of lamprey projects in last year's review of the Columbia Plateau Province. Pages 8-10 of the Program Summary lists proposed project needs and priorities for the lamprey program. It does not mention this proposal (35008) nor the need for a Systemwide Lamprey Program Coordinator to support the Lamprey Technical Working Group; thus, the ISRP is unclear of the level of support for this project from the LTWG, something that would be critical to program success if funded.

ProjectID: 200002900

Identification and thermal requirements of larval Pacific, river, and western brook lampreys

Sponsor: USGS, CRRL

FY03 Request: \$186,945 **2YR Estimate:** \$261,945

Short Description: Determine morphological and molecular characteristics that differentiate sympatric larval lampreys and evaluate thermal tolerances of larval lampreys by species

ISRP Final Comments:

Fundable to complete in two years as proposed. The response was adequate, but minimal. We agree with the CBFWA review and "urgent" ranking.

This project, now (2002) in its third year, will provide basic biological data on the species of lampreys occurring together in the Columbia River basin. With anadromous Pacific lamprey populations in decline, likely because of hydrosystem effects, and mitigation measures underway, there is a strong need to be able to identify that species from other lamprey species (western brook lamprey and river lamprey) that also reside in streams during early life stages. The project has focused initially on basic morphological tools of the taxonomist for differentiating eggs and early larvae raised in the laboratory, but there are plans to expand the effort to use biochemical genetic markers of species identity. Additionally, the rearing of larvae in the laboratory has been carried out at four temperatures in order to characterize the temperature requirements for survival of these stages, which might differ. An equipment failure caused delay in some aspects of the intended schedule, so the study team proposes another two years for completion. The final years will emphasize replicated work on morphological and temperature-effect studies, preparation of manuscripts on that work, and more emphasis on the genetic differentiation techniques.

The proposal was well prepared and informative, and met the ISRP review requirements (monitoring and evaluation was not considered especially relevant). The project has yielded good results for the first years of the study that were well presented in the proposal. There is an adequately prepared rationale and justification based on the Council's Fish and Wildlife Program and the uncertainties, goals, and objectives from the Columbia River Lamprey Program Summary and the Mainstem/Systemwide solicitation (which included the relevant Biological Opinion information). The proponents demonstrated knowledge of related projects in the basin, and coordinate with them informally. There are no monitoring and evaluation aspects to the planned studies. The staff seems well qualified to do the work.

ProjectID: 200005200

Upstream migration of Pacific lampreys in the John Day River: behavior, timing, and habitat use

Sponsor: USGS, CRRL

FY03 Request: \$250,000 **5YR Estimate:** \$665,000

Short Description: Determine behavior (timing and movement patterns) of upstream migrating Pacific lampreys in the John Day River Basin using radiotelemetry. Characterize overwintering and spawning habitats of Pacific lampreys in the John Day River Basin.

ISRP Final Comments :

Fundable. A response was not needed. We agree with the CBFWA review and "high priority" ranking. This is a proposal for continuation of a project begun in 2000 that was originally funded for a one-year duration. The ISRP noted in its favorable earlier review of the original 3-year proposal that some innovative aspects of the proposal could have application to lamprey research systemwide, and the project was funded for a first-year trial. The purpose of the initial project was, therefore, to demonstrate that Pacific lamprey could be radio-tagged and their movements, overwintering locations, and spawning habitats identified in the John Day River (the current proposal, however, chose to dwell unnecessarily on lost opportunities of the unfunded second and third years). The one-year demonstration project was successful for the summer through early spring migration and overwintering periods, as documented by data presented with this proposal and in a report to BPA. Timing of the funding cycle was not right to observe spawning. The current proposal would extend the one-year, initial effort to two more full tracking years (including the spawning component) and a data analysis/report preparation year.

The proposal was generally well prepared and informative. The ISRP review criteria were met. The work was well justified on the basis of a need to understand the biology of Pacific lamprey in

the face of population declines. The Council's Fish and Wildlife Program, the regional planning documents for lamprey, subbasin plans for the John Day and Umatilla rivers, and other regional documents were cited, as well as previous ISRP reviews. Results from the one-year study were presented in detail, and persuasively demonstrated the feasibility and utility of this work. There are clearly defined hypotheses, objectives, tasks (and even activities under tasks), which responded to earlier ISRP comments. The work as a whole is of a monitoring and evaluation nature. There will be clear benefits to lamprey from the greater understanding that this project has developed and will develop.

The geographic bound of the proposal is limited, but there is purported systemwide relevance for the results. The John Day River is clearly the focus of the study, but the proposal claims that this work will aid lamprey studies in general and restoration work on the Umatilla River in particular. The ISRP suggests that a proposed study of lamprey in the Willamette River (35009) would also be benefited. The project would also participate actively in basinwide coordination of lamprey research.

If funded, this project should be coordinated with other monitoring projects to ensure compatibility of objectives, common methods, and protocols. This coordination could be accomplished under the favorably reviewed CBFWA proposal #35033.

ProjectID: 35006

Use of Mainstem Habitats by Juvenile Pacific Lamprey (*Lampetra tridentata*)

Sponsor: PNNL

FY03 Request: \$100,985 **5YR Estimate:** \$333,366

Short Description: Characterize the use of mainstem Columbia and lower Snake River habitats by juvenile Pacific lamprey and identify river reaches with high potential for restoration or expanded use.

ISRP Final Comments:

Fundable. We disagree with CBFWA's "recommended action" designation and believe the proposal should be higher priority. This research is fundamental to lamprey recovery in the basin, and this project is likely to contribute substantially to understanding mainstem rearing opportunities for juvenile lamprey. The sponsors propose to investigate utilization of shoreline habitats in riverine sections of the mainstem Columbia and Snake Rivers by juvenile lamprey and use this information to extrapolate habitat use and restoration potential to larger spatial scales. The proposal is well prepared and reflects the input of previous reviews by the working group on lamprey and the previous submission to the FWP. The sponsors are particularly well suited to conduct the research. The response adequately addressed the ISRP's concerns about additional methodological detail.

If funded, this project should be coordinated with other monitoring projects to ensure compatibility of objectives, common methods, and protocols. This coordination could be accomplished under the favorably reviewed CBFWA proposal #35033.

ProjectID: 35009

Evaluate Status of Pacific Lamprey in the Willamette River Subbasin

Sponsor: ODFW

FY03 Request: \$129,991 **5YR Estimate:** \$977,991

Short Description: Determine distribution and population status of Pacific lamprey in the Willamette River subbasin. Evaluate system-wide implications of trends in distribution and abundance of Willamette subbasin Pacific lamprey.

ISRP Final Comments:

Fundable. Response adequate. We agree with the CBFWA review and “high priority” ranking. The Willamette may be a major, or the major, production area for lamprey in the Columbia Basin, but, currently, very little is known about specific utilization of the Lower Willamette. This project should provide useful information concerning lamprey distribution and abundance in the Willamette. The sponsors adequately addressed the ISRP’s concerns.

If funded, this project should be coordinated with other monitoring projects to ensure compatibility of objectives, common methods, and protocols. This coordination could be accomplished under the favorably reviewed CBFWA proposal #35033.

Bull Trout

ProjectID: 35002

Determine origin, movements and relative abundance of bull trout in Bonneville Reservoir.

Sponsor: WDFW, YN

FY03 Request: \$379,601 **5YR Estimate:** \$1,525,101

CBFWA Adjusted FY03: \$293,351 **3YR:** \$598,351

Short Description: Determine the abundance of bull trout in Bonneville Reservoir. Monitor movements into Hood River and Klickitat River.

ISRP Final Comments:

Fundable in part. Agree with CBFWA and the sponsors’ revision of the proposal and the budget reduction. We disagree with the Urgent ranking assigned to the proposal by CBFWA and view the proposal as a lower priority action.

If funded, this project should be coordinated with other monitoring projects to ensure compatibility of objectives, common methods, and protocols. This coordination could be accomplished under the favorably reviewed CBFWA proposal #35033.

Based upon the sponsor’s response, the ISRP suggests two years of funding to explore feasibility of capturing bull trout in Bonneville Reservoir with subsequent funding contingent upon demonstration of the efficacy of capture techniques. The project hinges on the ability of the sponsors to effectively capture bull trout in the reservoir. There is considerable uncertainty associated with this objective because bull trout apparently are rare and difficult to capture in the mainstem Columbia. Without an effective method of capture the essential parts of the proposed work could not be accomplished.

Utilization of Bonneville Pool by migratory bull trout is poorly understood. This proposal seeks to improve understanding of the stream of origin and migratory patterns of bull trout found in Bonneville Pool. The work is consistent with the USFWS’s 2000 Biological Opinion. The

proposed work would develop methods for effectively sampling bull trout in the reservoir, install a fish trap to monitor movement in the Klickitat, radio tag fish from the reservoir to monitor movements from the reservoir into tributary rivers, and conduct genetic analyses to determine river of origin.

If funded, this project should be coordinated with proposal 35013; e.g. they should record observations of gas bubble disease symptoms in sampled bull trout.

Avian and Fish Predation on Juvenile Salmonids

ProjectID: 199007700

Northern Pikeminnow Management Program

Sponsor: PSMFC

FY03 Request: \$2,957,438

5YR Estimate: \$16,520,975

CBFWA Adjusted FY03: \$2,870,000

3YR: \$9,100,000

Short Description: Reduce predation on juvenile salmonids by implementing fisheries to harvest northern pikeminnow in the mainstem Columbia and Snake rivers. Monitor effects of fisheries on predation by northern pikeminnow and other resident fish.

ISRP Final Comments:

Fundable in part as agreed to by the sponsor and specified in CBFWA's comments: "The O&M phase of the project has been reduced by \$88,000 in order to remove the site specific and dam angling fisheries due to their reduction in cost effectiveness." CBFWA' continue to rank this project as "Urgent." However, the ISRP urges more economic accountability and innovation. The ISRP disagrees with the budget reduction eliminating \$40,000 to cover the expense of an economic analysis of promotion cost and sport reward costs. Additionally, the ISRP believes the economic analysis should include other elements discussed below.

This is a long-term project to continue 12 years of managed harvest of northern pikeminnow, the principal predator of salmonid smolts. The project has become more evaluative over time. Catch per effort of northern pikeminnow, appears to be on a downward trajectory. Probably, this is because of the success of the program in depressing northern pikeminnow populations. There is likely a net benefit to adult salmon returns, but those benefit numbers have likely stabilized. Neither monitoring nor evaluation contains an economic component, but economics, including independent cost-effectiveness monitoring, should be a part of the project's evaluation.

The Hankin and Richards report that reviewed the program two years ago (on recommendation of the ISRP) contained recommendations for improving the efficiency of the program. Two such recommendations not yet implemented are to conduct further study of the tiered reward system and to explore possibilities to increase rewards by decreasing promotion costs. To their credit, the sponsors have agreed to eliminate two major inefficiencies, the tribal fishery and the tailrace fishery, and to investigate various alternative reward systems. Calculations suggest a definite decline in biomass and average size of northern pikeminnow in recent years. As catch has been declining, so have costs of rewards, and this explains part of the continuing "improvement" in cost containment.

Due to the high annual cost of this project, reviewers suggest that it may be time to creatively re-think how this program could be further improved. It would be worthwhile to consider new ideas for streamlining or economizing the approach. Considering that there is a trend of declining

biomass (annual averages of 73 M grams in 1991-96 vs. 51 M grams in 1997-2001), analyses might be conducted to assess alternative predator control strategies. Alternative strategies, might be explored, that would increase the incentives for fishing. The attractiveness and spin-off benefits (e.g. increased tourism) of other types of rewards, incentives and approaches (e.g. a major international pikeminnow derby every year with large prizes for capture of tagged fish) might be investigated as a way to enhance public awareness, maintain effectiveness, and control costs.

The ISRP raised related questions about control of other exotic predators that might be explored in the future. Smallmouth bass, channel catfish and walleye are exotic species whose harvest is regulated by the management agencies according to objectives that may be in conflict with objectives of the Council and NMFS with respect to enhancement and recovery of salmonids in the basin. Some or all restrictions on sport harvest of exotic species might be lifted in order to reduce their populations and thus their predation on salmonid smolts.

In summary, the project is recommended for continuation with the recommendation that thought be given to new, innovative, cost-saving approaches that might be used to reduce pikeminnow predation on salmonids. As mentioned above, the Council funded an economic review of the project by Hankin and Richards two years ago. Their report contained recommendations for improving the efficiency of the program. Considering the visibility of this program and its cost, we believe it would be in order for the Council to request a follow-up and more in-depth review of the program. Because the economic issues are intertwined with biological issues, further joint ISRP/IEAB review could be a constructive approach toward improving the effectiveness of the program.

ProjectID: 199702400

Avian Predation on Juvenile Salmonids in the Lower Columbia River

Sponsor: OSU/USGS/CRITFC/RTR

FY03 Request: \$713,000

5YR Estimate: \$3,688,000

CBFWA Adjusted FY03: \$680,000

3YR: \$2,080,000

Short Description: Determine predation rates by waterbirds on juvenile salmonids, evaluate the efficacy of management initiatives to reduce avian predation, and assist resource managers in the development of plans for long-term management of avian predation, as warranted.

ISRP Final Comments:

Fundable, agree with CBFWA's "Urgent" ranking. The sponsor offers to eliminate two tasks 3.2 and 3.3 for budget savings. The ISRP has made some alternative suggestions to make the research more relevant directly to salmonid survival improvement and the researchers indicated willingness to consider such improvements. These were done without suggestions for budgetary reduction.

This proposal is designed to determine predation rates by seabirds on juvenile salmonids, evaluate the efficacy of management initiatives to reduce avian predation, and assist resource managers in the development of plans for long-term management of avian predation. The current proposal is for continuation of work that has been underway for several years, but that is now being driven by a settlement agreement from an intensive court case that pitted the interests of bird conservationists against those restoring salmon. There is an expanded budget that reflects settlement-mandated tasks.

The ISRP review criteria are met. The experimental design is good. This five-year program has gathered much new information about tern biology and feeding behavior. Key recommendations have been to move, if not eliminate, breeding habitat. These recommendations have been successful. The proponents have given a good summary of past results. They have measured the net effectiveness of tern removal on salmonid survival that is contributing positively albeit modestly to recovery according to population models. Bioenergetics of tern diet, stable isotope ratios studies, fatty acid signatures, and contaminant levels may be valuable in further assessing tern diets and impacts on salmon.

A shortcoming identified in previous years was the lack of peer-reviewed publications, a factor now addressed by the latest group of publications. Another previous shortcoming was the need for a more in-depth review of the program. This review has been accomplished externally via the court case. Although this proposal does not dwell on the court case, there was impetus from it for looking at other bird predators of salmonids (to put terns into broader context) and other potential nesting sites to receive research and management attention (upriver and coastal).

The authors were highly responsive to ISRP questions and (1) illustrate important facts that cast better light on the rationale for their studies and (2) suggest alternative approaches to gather data that may be more relevant to improving salmon survival. Much of the proposed new tern research is aimed at assisting the growth, development and monitoring of new tern colonies elsewhere, which must be balanced with colony reductions in the estuary for enhanced salmon recovery. Other parts of the monitoring and research proposal tasks seem to be on details and data not directly useful or have large payoffs for the FCRPS management objectives. The sponsors agreed to address several important questions that seem relevant to the FCRPS: the relationship of predation loss to juveniles that (1) migrated in river or (2) were transported near the estuary in a barge. Since PIT tags usually contain this information, a study of existing PIT tag data seems in order. Thus far, NMFS studies have shown that SARs (adult returns) from transported smolts exceeds SARs of juveniles that migrate through the FCRPS. One important strategy that could reduce tern predation might be adjustments in the timing, location and patterns of release of smolts from barges in the estuary. For example, if terns are daylight feeding birds, would release at night improve predator avoidance? Or, would release closer to the ocean reduce bird predation without other impacts to the SAR rate. The researchers indicated a willingness to include such analyses where possible with PIT tag data and to coordinate with the NMFS and USACE in such experiments.

The past five years of research has been good and has provided ample information about the impacts of terns to salmon. Logical management actions (moving or reducing tern populations) are now being implemented to the extent they are allowed by the courts. Some further management experiments that relate to how, where and when transported fish are released from barges may be useful to the FCRPS and the sponsors have agreed to address these options. The authors are willing to collaborate with transport release studies. Presumably, these would need to be included in research funded by the USACE. Another future research effort could examine the differences between hatchery and wild fish losses.

If the proposal is funded, some restatement of tasks and goals would be in order to reflect the modifications and effort reorientation mentioned in the response. The sponsor identified the following tasks for elimination in the interest of cost savings: **Task 3.2.** Collect information on diet composition at selected gull colonies in the lower Columbia River between Bonneville Dam and the mouth of the Snake River; **Task 3.3.** Collect information on foraging aggregations of piscivorous seabirds along the lower Columbia River between Bonneville Dam and the head of McNary Dam pool.

The ISRP agrees that these tasks have lower priority. However, given the importance of other questions related to salmon survival posed in the review, the ISRP is not recommending reduction in the budget for this program. Instead, these tasks are given lower priority and should be addressed only if other more pressing tasks can be completed with the funds provided. If appropriate, the proposal could be recast to reflect these changes in priority.

ProjectID: 35032

Assess the Feasibility of Reducing Predation on Juvenile Salmonids in the Columbia River Through Operation of the Hydropower System

Sponsor: USGS, CRRL; ODFW

FY03 Request: \$509,671 **5YR Estimate:** \$2,394,540

Short Description: Evaluate components of riverine habitat that might be manipulated to limit predators and predation loss. Examine and collate existing information, evaluate methods to estimate effects on predator populations, and collect additional information needed.

ISRP Final Comments:

Not Fundable. Disagree with CBFWA's High Priority ranking. The ISRP had significant reservations and substantial questions about whether practical progress could be made with the proposal as presented. Responses to the ISRP questions were inadequate primarily regarding the research program design.

In the oral presentation, the authors acknowledged that physical habitat modifications might also be possible. This concept presented is a generalized idea, but needs specific hypotheses. The study might take a decade or more and result in much data that can't be well coordinated. Evidence needs to be given that specific actions have realistic management applications. The predators discussed all have different life histories. The study doesn't show that it is in the realm of hydraulic possibility. There are two major concerns and a host of minor issues that needed to be addressed but were not in either the proposal or the response.

First major concern: the hydropower system management actions that are foreseen were not clearly presented, which leaves the question whether all this work might lead to recommendations for physically impossible operations. Second, there was insufficient evidence concerning the exact mechanisms of life history disruption sought. The proposal seems to ask for funding to discover such possibilities. Such efforts could take indefinitely long periods.

A key target area of the proposal is downstream of Bonneville Dam. The ability of the hydroelectric system to control depth and velocity in this area will be limited. Demonstration with hydraulic data that hydro operational changes could possibly have the desired effect would have been valuable in making the case for the research. Much is known about the habitat requirements of predatory fishes that might be targeted. A discussion of these in the context of what is known about present operations of the hydroelectric system would have been useful in justifying the proposal. For example to dewater or lower water levels in the tailwater area at Bonneville Dam would require significant retention of storage and complicate water levels, flows and upstream operations that might have undesired or unacceptable impacts on fish, wildlife, human uses upstream, in addition to constraining the normal power system operations. Furthermore, the proposal would need to consider possible negative effects on salmon or other desirable fishes of any proposed manipulation of operations. For example, many years have been spent fine-tuning the operations of the spillways, turbines, and fish ladders to maximize adult salmon passage and

to direct juveniles to areas of highest passage survival. These would need to be taken into account.

In summary, the ideas in this proposal are intriguing but were insufficiently developed and possibly targeted to the most difficult location in the FCRPS to implement, the tailwater of the Bonneville system.

Estuary/Plume and Lower Columbia

With the exception of proposal 35046, these proposals were also submitted for the Estuary and Lower Columbia River Province Reviews.

ProjectID: 35025

Optimization of FCRPS Impacts on Juvenile Salmonids: Restoration of Lower-Estuary and Plume Habitats

Sponsor: OHSU

FY03 Request: \$435,192 **5YR Estimate:** \$1,206,325

Short Description: Restore Columbia River estuary and plume juvenile salmonid habitats and optimize FCRPS impacts on the plume through improved understanding of estuary and plume physical processes and definition of possible future management scenarios

ISRP Final Comments:

Fundable. Disagree with CBFWA's recommendation of "Recommended Action". This is an important component of the estuary program, especially the monitoring objectives and warrants a higher priority. The response provided a clear articulation of the areas in which this project complements other projects and those in which it is unique. This project and #199801400 (Plume) and #30001 (Estuary) are tightly integrated in the data they will produce and the analyses that will be conducted. The ISRP acknowledges that their past comments may have over-emphasized the management science of this proposal.

Previous reviews by the ISRP in the Lower Columbia/Estuary province had primarily focused on the objectives related to interaction with policy makers on operation of the FCRPS, which is actually a relative minor component of the full project. In project 35025, 85% of the budget is for environmental monitoring (remote sensing) and development of their concept of "habitat opportunity" as a means to assess the suitability of the plume to salmon. The remote sensing component of project 35025 (allowing analyses of parameters not included in the Plume proposal) is an important component of the set of projects in Estuary and Plume. Two other considerations are notable: the development of remote sensing (in coordination with CORIE) and numerical models may reduce long-term costs of oceanographic surveys (i.e., in the Plume proposal), and these investigators may provide large returns through other funding agencies.

The remaining 15% of the costs associated with this proposal is directed to the Project Management Board and interactions with the FCRPS. Proceeding with the above data aspects and beginning dialogue with the FCRPS should proceed so that when analyses of flow and plume issues are complete, the FCRPS is familiar with the issue and have an informed basis for response. A strength of this project is its emphasis on the eventual application and implementation of project results in management actions. The management science approach to laying out alternative scenarios for FCRPS managers will probably be quite useful in helping to

articulate opportunity costs of particular river management strategies and to distinguish low-cost from high-cost management actions. It should enable a systematic assessment of tradeoffs.

This proposal makes a persuasive case for the integration of flow management with the needs of salmonids in the lower Columbia River, estuary, and plume environments. Dr. Jay has assembled a strong research group and has obviously tried to more clearly enunciate the value of this project to Columbia River salmonids and impacts of future climate scenarios. The RME comments strengthen our support and the obvious need for mutual consideration of flow and fish.

The purpose of this program (section 9, page 24, Tasks and Methods) is “to optimize the interactions of the FCRPS with juvenile salmonids in the lower-estuary and plume.” The technical background in this proposal is thorough and reasonable but we must still acknowledge that the importance of the plume environment to salmon survival remains unquantified or tested. With the current developments in the micro-tags and extensive studies in the lower river, estuary, and plume, we may have answers to these questions in the near future. Therefore, in considering this proposal, it is important to note that the proposal emphasizes the need for understanding and dialogue with hydro-system managers, but does not presume that the FCRPS would immediately be modified to meet the ‘habitat opportunity’ needs of the fish. The intent of the program is clearly to examine if fish needs can be incorporated into the water management planning cycle, and to explore how modifications of flow could benefit salmon while remaining within the limits imposed by other requirements. Further, if agreements could not be reached on how to respond to specific scenarios, then the models and sampling programs developed in this project provide an ideal opportunity to design a truly adaptive management approach to understanding the “integration of flow management with the needs of salmonids in the lower Columbia River, estuary, and plume environments.”

The ISRP believe there is an obvious need to initiate dialogue with the FCRPS managers so that an understanding of the proposed research and process is begun. If FCRPS managers are not prepared to consider possible alterations in flow plans or how to respond to different climate conditions or annual deviations in weather, then there are a number of extensive programs that may not need to be funded at all. The costs and benefits of all recovery opportunities need to be considered, none should be excluded particularly given the investment made in science within the Columbia River Basin.

Two points for clarification remain after the response. The ISRP is not certain that the definition and analysis of “habitat opportunity” will be addressed in areas upstream of the estuary to Bonneville Dam. If this was not the intention, then it must be integrated into project 35025. Further, the final definition of “habitat opportunity” continues to need clarification and we request that these investigators maintain communication with Basin agencies on this issue.

ProjectID: 35046

Estimate juvenile salmon residence in the Columbia River Plume using micro-acoustic transmitters.

Sponsor: NMFS

FY03 Request: \$2,595,600

5YR Estimate: \$17,172,100

CBFWA Adjusted FY03: \$878,300

3YR: \$5,908,600

Short Description: Estimate juvenile chinook salmon residence time and areas of utilization within the Columbia River plume.

ISRP Final Comments:

Fundable (Qualified). Specifics of the collaboration with Dr. Welch, including budgets, need further discussion. Disagree with CBFWA recommendation of High Priority; development of the smaller 400 kHz tag is essential to investigating the residence of salmon within the Columbia River plume and is urgent. The development of the new tag also requires the development of new detection equipment, including work to define the acoustic environment for the tag in the estuary and the plume. The majority of the tag development and the estuary detection are currently funded under a USACE program. Development of the open-water detection equipment for the plume environment and the anchoring systems is included in this project and through a proposed collaboration with Dr. Welch (Estuary proposal #30007).

The overall objectives of this proposal are to determine plume residence times of ocean and stream type salmon, characterize fine-scale spatial use of the plume by these two types, and integrate results with the companion project (the NMFS Plume study, project #199801400) to build a biophysical model relating Columbia River plume conditions to the growth, distribution and survival of juvenile salmonids.

This proposal would complete development of micro-acoustic tag methodology and assess residence of salmonids in the Columbia River plume by deployment of fixed and mobile receiver arrays. The approach taken by the project will be to characterize the acoustic environment of the plume, model signal propagation (to adjust for noise in the plume environment), design the detection system, set tag criteria and design, conduct prototype tests, then proceed to full-scale monitoring. Risks identified by the proponents are the difficulties of obtaining adequate sample sizes, the fixed array design, cost, and limited detection range due to phase shift encoding. Ultimately, the goal of the project is to answer the critical uncertainty about temporal and spatial use of the plume habitat by juvenile salmon (see past ISRP comments on NMFS project 199801400). The project will compare the residence times of different life history types (stream and ocean) of chinook salmon, timing of outmigration (early versus late), size and age, to determine how they vary by season. It also proposes to assess the nature of juvenile distribution within the plume.

The technical background is well written and complete. The rationale for the importance of understanding juvenile use and survival in the plume is clearly significant to regional programs (as evidence by the comments to proposal 35025 above). The tasks and methods are described in appropriate detail and a very strong development and research team has been organized. The ISRP wishes to compliment these investigators for their substantial progress on the micro-tag to date. This tag may now offer a real opportunity to study salmonid residency and use of the Columbia River estuary and plume.

However, in the preliminary ISRP report, we requested a response to two major concerns with the receiver arrays. First, the development of the fixed and mobile arrays apparently doubles the costs for this portion of the work. Secondly, we are familiar with the work of Dr. David Welch (CDFO, Pacific Biological Station, project proposal #30007, Estuary province), and BPA has previously supported his research. Dr. Welch has put a substantial investment of time into designing fixed arrays, their deployment, and how to retrieve the data received. Since this must be a very small group of researchers in this field, we were concerned by the evident lack of collaboration. The response received addressed these questions by proposing a collaboration with Dr. Welch and by phased development of the detection systems.

When the ISRP considered the development proposals by Dr. Welch (in the Estuary provincial review), we proposed supporting a prototype or “proof of principle” scale program initially, followed by expansion if successful. In this response, a 4-line array to address the “proof of principle” concern is proposed by Dr. Welch and the NMFS proponents. Four anchored arrays would be established in 2003 and include one array south of the Columbia River, two off the Washington coast, and one at the north end of Vancouver Island, BC. This is similar to Dr. Welch’s proposal to the Estuary province. The collaboration between proposals would be the possible use of the anchored arrays to also hold the 400 kHz detection systems (requires completion of detection system first, not expected before 2004). While the ISRP recognizes the efforts to collaborate, we are not convinced the array locations are adequate to test the detection systems. The arrays are very widely separated and would initially only go out to the 100m contour. We fully understand the interest in testing the existing acoustic tags and their detection in the open ocean, but the primary responsibility of the ISRP is whether the proposed design will provide an adequate test of the arrays. We clearly disagree with comments like “the fixed array locations selected are sufficient and adequate “exit” stations that can be used to document plume usage and initial shelf oriented behaviors” (point 2, 1st para. John Ferguson letter). The task that NMFS was to address was residence and survival in the plume ... how could 4 lines of fixed arrays over several hundred miles of the coast be “sufficient” to address this? The ISRP does not support funding this collaboration until an acceptable design for a “proof of principle” scale program is presented. This should include what criteria would be recommended for the “proof” and the number of arrays needed to truly test this important issue (expand numbers if necessary but justify).

Concerning the 400 mHz detection arrays, we requested the proponent to consider a phased development plan for the two systems (if both are needed) and provide justification for the choice of array. From the perspective of the ISRP, development of the fixed arrays would seem to best address Regional priorities at this time. The issue of residence time and habitat use for downstream migrating smolts actually begins below Bonneville Dam. Questions about their rate of migration and estuary residence are equally as important to the estuary studies and could also be assessed with this technology. Concerning research in the ocean plume environment, our first priority is to determine the duration of use and overall survival. The detailed micro-habitat use by salmonids clearly addresses mechanisms effecting growth, survival, etc. but are finer scale questions that can be phased in over time. The proponents’ response was that they should continue to develop the technology for both systems but that they would only use the fixed anchor arrays initially, and that their development would be phased in over the next three years.

During this development, the ISRP again recommends a smaller scale demonstration project when the tag and detection systems are completed. The full implementation of this proposal could eventually cost millions of dollars a year, which we consider unreasonable risk without adequate proof of performance. The ISRP also notes that a phased project would require annual evaluations.

ProjectID: 30007

An Acoustic Tracking Array for Studying Ocean Survival and Movements of Columbia River Salmon

Sponsor: Kintama Research Corporation

Province and Subbasin: Columbia Estuary

FY03 Request: \$2,930,535

5YR Estimate: \$7,345,735

Short Description: Development of a skeleton acoustic array to demonstrate an approach to tracking movements of individual fish through the river and along the West Coast of North America. The project will initially be focused on salmon, but has much wider application.

ISRP Final Recommendation: Fundable in Part

CBFWA Category: Do Not Fund

ISRP Comparison with CBFWA: Disagree - Fundable in Part

ISRP Final Review Comments from Estuary Province:

See comments on 35046. Specifics of the collaboration with 35046, as proposed in the Mainstem and Systemwide response loop, need further discussion. Fundable in Part (Qualified) at a reduced level of support, disagree with CBFWA. Development of the final design for the acoustic arrays is high priority. This is an innovative but expensive research project that could provide new and important insights into the early sea-life of salmonids and their use of the ocean environment. However, as we have noted in previous reviews, the funding for proposals in this province will be very competitive. The ISRP suggests though that it would be a reasonable process to discuss the final array design with the proponents and to develop an incremental budget over the next few years.

This proposal continues to be technically innovative and the investigators have essentially completed the Innovative Project (#200008000) tasks. These results are presented and relevance to the FWP is well described. The purpose of this proposal is “to expand research on the acoustic tag and develop a prototype array which will allow demonstrating the capabilities of the technology to establish both river and ocean movements of chinook salmon (page 5).” The author states that the basic technology is now commercially available and the efficiency of its components has been tested. However, he does also note that,

“the logistics of deploying the equipment and gathering the data from fish tagged at various locations will require extensive effort over a wide geographic area. Deployment of equipment in the ocean will require significant R&D design effort (in particular, we intend to place the entire array sub-surface so that surface floats vulnerable to vessel traffic, fishing activities, and “curious” individuals are eliminated). Designs have been developed and partially field-tested for deploying the equipment on a semi-permanent basis to withstand the severe conditions that may be encountered at various sampling sites.”

The importance of this technology is that it provides a means to actually measure migration rates (not necessarily migration paths, they will be inferred between two points), residency time in an area (e.g., within the Columbia River plume), and mortality rates.

In general, fairly comprehensive responses were provided for most of the ISRP concerns. The author noted that he will comply with the requirements of the Innovative proposal and that the work is now complete. He noted that there do remain issues with the deployment of the acoustic

detection arrays but also noted the recent success of deployments in the Atlantic Ocean. There was an additional discussion concerning an interaction with the NMFS Plume project to assist in the assessment of residence times and mortality rates. However, this would be an additional task that was not included in the Plume response and is not relevant for our consideration. The major issue of concern is how to scale the development of these acoustic arrays. The authors have proposed a deployment plan and argued that a critical mass of receivers are required and that the preferred strategy is multiple array lines (compared to fewer lines with more receivers per line). The authors provide adequate justification for this strategy but a minimum number of line arrays were not specified (although a proposed number was suggested).

The ISRP concerns regarding dedicated time of the investigators were addressed and the PI suggested that if the project was supported that he would likely request a three-year leave from his current position. The other budget issue noted was that an allowance for 20% loss of the receivers per year was added to the annual budgets. The budget was re-profiled over time but, in total, it increased.

A remaining limitation of these studies is the size of the acoustic tag. The tag may be suitable for juvenile spring chinook and steelhead (and likely coho), but not for smaller juvenile salmonids. While this may be a limitation for some in-river studies or plume studies for fall Chinook, it is not likely a reason to delay testing of the receiver arrays that can be tested with the larger tag.

CBFWA Estuary Review Comments:

Reviewers believe this proposal may be better suited for the Systemwide Province since this issue is not exclusive to the estuary. If the tracking could be scaled down to include only the plume, then the project could be considered for review in the Estuary. The project sponsor should resubmit this proposal for the Mainstem and Systemwide solicitation.

NOTE: The ISRP reviews from the Estuary Provincial review for proposals 30007 (above) and 30010 (below) should be considered in any Council decision on funding of these proposals through the Mainstem and Systemwide project selection process.

ProjectID: 30010

Canada-USA Shelf Salmon Survival Study

Sponsor: DFO

Province and Subbasin: Columbia Estuary

FY03 Request: \$418,800

5YR Estimate: \$2,094,000

Short Description: This project surveys the size, condition, and biological condition of juvenile salmon occupying the British Columbia & SE Alaskan continental shelf regions in the autumn (October). The survey also includes extensive collection of oceanographic data.

ISRP Final Recommendation: Fundable in Part

CBFWA Category: Do Not Fund

ISRP Comparison with CBFWA: Disagree - Fundable in Part

ISRP Final Comments from the Estuary Province Review:

Fundable in part. Clarification of personnel and management issues are essential before supporting this project. This proposal requests funding from BPA for an October coastwide survey of juvenile salmonids and oceanographic conditions along the continental shelf to complement summer surveys conducted by the Science Branch, Canadian Department of Fisheries and Oceans (CDFO). The proposal includes an extensive and informative summary of recent findings based on similar surveys conducted since 1998 by CDFO (some previous funding

apparently provided by BPA but not reviewed by ISRP). Based on these surveys, the proponents indicated that salmon from the Columbia River tend to migrate northward along the continental shelf, that growth of salmon (in particular chinook and coho salmon) and marine environmental conditions are not equal along the shelf, and that certain stocks of salmon have a propensity to rear in specific areas of the coast. These investigators hypothesize that the productivity of some Columbia River salmon stocks is more dependent upon where they rear in the ocean than due to their freshwater or estuary conditions.

The proposal requests ongoing (5 years) support for 28 days of ship-time for an October survey and sample processing. The survey is intended to map ocean conditions determining the growth and survival of Pacific salmon along the West Coast of North America from the British Columbia-Washington border to South East Alaska, and to identify which stocks of Columbia River salmon forage in these areas. The stated objectives were (Section 9f, page 29):

- (1) identify the extent of the region of poor growth and survival,
- (2) measure the growth and feeding conditions of the salmon within these areas,
- (3) identify the physical and biological changes in the ocean that lead to reduced ocean survival through changes in growth, and
- (4) identify the identity of the fish occurring in this region of poor growth using DNA.

While the response was adequate, it generates significant concerns about what portion of the researchers' time the Council would be supporting. The proposal is for an October cruise along the Pacific west coast but that cruise is only one of four such cruises each year. The basis of the labor costs continues to be unclear ... how many months are associated with the October cruise, at least two of the positions noted are not staffed, and who else is contributing funding for these PDFs and graduate students? While the ISRP is supportive of this research we must also be aware that funding in this province will be extremely competitive and involves several large projects. Consequently, we are inclined to recommend provision of operating expenses for the October cruise and not personnel costs unless these can be more accurately described and the costs are fairly accounted for and distributed over other sponsors also (i.e., who supports 3 of the 4 annual cruises?). Further, there is now an additional concern regarding the PI. Given his statement in project #30007, if that project was supported the PI expected to take a 3-year leave to focus on that project. What would be the consequence of that action and would this project (#30010) continue? In the response to project #30007, the PI indicates that his other programs should be able to proceed without him but this leaves a level of uncertainty that would not be treated lightly in any other proposal reviews.

CBFWA Estuary Review Comments:

Reviewers suggest that it may be more appropriate to review this proposal through the Systemwide Province review since it has systemwide implications (i.e., looking at fish from throughout the system). The issues to be reviewed are not necessarily affected by the plume/estuary. The project sponsor should resubmit this proposal through the Mainstem and Systemwide Province. NMFS has identified this project as a BiOp project.

ProjectID: 35001

Habitat Monitoring and Restoration Program for the Lower Columbia River and Columbia River Estuary

Sponsor: LCREP

FY03 Request: \$220,000 **5YR Estimate:** \$1,720,000

Short Description: Establish ecosystem-based program to identify, prioritize and implement habitat restoration projects and implement pilot project to develop habitat monitoring protocols for monitoring and evaluation of habitat protection and restoration projects.

ISRP Final Comments:

Withdrawn, this project was funded through the Lower Columbia and Columbia Estuary Provinces. Our recommendation was: Fundable, the likely benefits to fish and wildlife appear to be high.

ProjectID: 35055

Role of Bacteria as Indicator Organisms for Watershed Assessment and in Determining Fish Pathogen Relationships with Fauna of Abernathy Creek

Sponsor: USFWS

FY03 Request: \$76,000 **5YR Estimate:** \$196,600

Short Description: The purpose of this project is to develop techniques to assess watershed health and fish health using bacteria as system indicator organisms.

ISRP Final Comments:

Not Fundable. Disagree with CBFWA's Recommended Action ranking. The ISRP's earlier recommendation of Fundable (qualified) in the Lower Columbia/Estuary Province was contingent upon submission of a completed experimental design developed with full collaboration of a statistician. The Mainstem and Systemwide solicitation and response provided an opportunity to complete an experimental design, but the proposal and response does not provide this.

The objective of this project was to identify bacterial fish pathogens as indicator species for fish and watershed health. This proposal would use polymerase chain reaction (PCR) and species-specific primers to show the presence of aquatic bacteria in water and tissues of living organisms to determine their relationships to aquatic life. The idea was to identify bacteria species that can serve as indicators of aquatic ecosystem health. The technical background to this problem is adequate, as is the relationship to regional programs and other projects. The response placed this work in the context of RPAs under the FCRPS BiOp.

Tasks and methods to meet these objectives are described in a fair amount of detail. However, detail about the sample design is absent. The response to the question about sampling design takes the approach of sampling within the constraints of time and personnel, and seems to miss the point that a sampling scheme is determined by the requirements of the statistical analysis necessary to answer the research questions. We are not sure the principal investigator is aware that some analysis may not be better than none if the data are inadequate, and were confused at the process he describes for determining the power of the test etc. after he has sampled. These are the things that determine sample size.

The proposal could be clearer on how presence of bacteria types will be linked to the level of ecosystem health. Without a control, this work will be limited to establishing a description of the presence of ecosystem conditions in association with certain groups of bacteria, but the study will not generate understanding of processes by which these bacteria/conditions associations work.

The ISRP does note that the use of bacteria as an indicator of watershed health is a topic worthy of consideration. This proposal though is technically inadequate.

ProjectID: 35035

Incorporating Pit Tag Technology to Evaluate and Monitor the Reintroduction Effort for Anadromous Salmonids in the Upper Cowlitz Watershed

Sponsor: WDFW

FY03 Request: \$203,740 **5YR Estimate:** \$619,182

Short Description: We propose to update pit tag system to basin ISO standards at the Cowlitz Falls Dam and Fish Facility and use pit tags to monitor and measure collection, collection efficiency, smolt production, and a prototype surface collector entrance.

ISRP Final recommendation:

Not Fundable; disagree with CBFWA (Recommended Action). The response briefly describes a process for developing a study plan for the upper Cowlitz watershed, but does not provide an adequate response to the ISRP. The response was clearly influenced by the comments from CBFWA and NWPPC staff which indicated that even with an adequate and timely response, the Cowlitz proposals would not be funded given basin priorities and available funds (as part of the Lower Columbia project selection process). Consequently, the response did not supply the needed information. The ISRP reiterates that the upper Cowlitz offers one of the best environments and research opportunity to study supplementation.

The ISRP recently reviewed this proposal and project # 31005 (Incorporating Pit Tag Technology to Evaluate and Monitor the Reintroduction Effort for Anadromous Salmonids in the Upper Cowlitz Watershed, WDFW) under the Lower Columbia/Estuary province. The ISRP was supportive of the upgrading of the PIT detectors to be consistent with downstream detectors, but we strongly noted the unique opportunities for important research in the upper Cowlitz River tributaries. We noted that the real value to the Basin in this upgrade is the monitoring and evaluation capability that could be incorporated into this research. The current proposal did not provide a study design but commented on a group organized to develop the research design.

The ISRP also noted that the proposal had very strong BPA cost sharing already in-place and that costs in this proposal are distributed over a couple of years. Proceeding with the upgrade would be advisable in order to be prepared for future studies. If a research program did not subsequently develop, then the benefit of this investment would be much more localized. There would still be value in the assessment of Cowlitz salmon production.

The provision of an inadequate response clearly limits any recommendations of the ISRP but we must emphasize that lack of progress in developing this study site and provision of the necessary detectors is potentially a major loss of information for the Columbia River Basin! As a regional study site, the upper Cowlitz has enormous research potential that is unavailable in most other basins. Consequently, the lack of response and the associated events are disturbing to the ISRP.

If funded, this project should be coordinated with other monitoring projects to ensure compatibility of objectives, common methods, and protocols. This coordination could be accomplished under the favorably reviewed CBFWA proposal #35033.

Artificial Production Related Projects

ProjectID: 200001700

Kelt Reconditioning: A Research Project to Enhance Iteroparity in Columbia Basin Steelhead (*Oncorhynchus mykiss*)

Sponsor: CRITFC

FY03 Request: \$633,292

5YR Estimate: \$1,957,441

CBFWA Adjusted FY03: \$555,121

3YR: \$1,662,928

Short Description: Continue to test and evaluate to recondition steelhead kelts and/or transport them around the hydrosystem, generate science-based management recommendations, and assist in their implementation to rebuild wild steelhead populations throughout the Basin

ISRP Final Comments:

Fundable. We agree with CBFWA's review, study design and budget reduction, and "urgent" priority ranking. The sponsor's response also addresses most of the ISRP's concerns from the simultaneous Three-Step Review.

The proposal is well written and presents a logical and justified approach to examining uncertainties associated with kelt reconditioning. The proposal builds on work in this area over the last 2-3 years by the Yakama Nation and the US Army Corps. The proposal also addresses concerns expressed by the ISRP in its FY00 review of this ongoing project.

Strengths of the proposal include a systematic investigation of various reconditioning and transportation strategies, collaboration with other projects to expand the PIT tag and radio-tag information that can be collected, and a series of replicated treatments. This is a strong proposal that merits funding support due to its solid design and to the important information it may provide on enhancing steelhead populations. Another advantage of this study, as compared to the supplementation projects, is the 1-3 year timeframe for data collection, rather than the 5-6 years required in supplementation studies due to generation time. There is good cost sharing associated with this proposal, so apparently there is strong user support for the work.

Overall the project sponsors provided an acceptable response to the ISRP preliminary comments, but some remaining concerns should be addressed prior to implementation contracting.

First, there is an issue associated with the proposed tagging and release of reconditioned kelts below dams, and the percentage of fish that would be expected to return to the natal stream. What percentage of release is it reasonable to expect to return? A fundamental issue is that not all kelts should be expected to recondition in the first year and repeat spawn. In BC, steelhead kelts frequently stay at sea for more than one year before returning. In this study then, if a radio-tagged kelt does not return, what does this tell the researchers about its fate and the efficacy of the program? A return of less than 100% represents a loss in production and a reduced efficiency of the kelt reconditioning program. To address questions related to maximizing the efficiency of the program, sponsors need to determine the relationship between the degree of reconditioning, triggers for maturation, and natal fidelity (homing). From these relationships, managers can then plan how the kelt reconditioning program could be managed to maximize the number of reconditioned adults that return to the spawning grounds.

We initially identified a concern about genetically effective population size to which the project sponsors responded. In the fourth paragraph of their response to ISRP comment 6, sponsors state that "reduction of Ne should only result from..." reduction of the population size or increased

relatedness of the parents (or both). They then state that neither of these should occur. We disagree. The effect of iteroparity on the census population size (N) will vary between generations but should generally increase N. However, the inbreeding coefficient or relatedness will increase with iteroparity. The effect of these two factors though will depend on N and the degree of relatedness. Monitoring the effect will be very informative. Iteroparity is a natural trait that has been suppressed, but the size of the spawning populations has also been reduced (relative to pre-dam times). The effect of iteroparity could be very different now than in the past; we only asked the proponents to consider this when assessing the value of reconditioning and the scale at which they may want to conduct it.

The stated objectives in the proposal and descriptions of actions (in response) related to Objective 4 (University of Idaho, Hagerman reconditioning experiment) are not consistent. These need to be clarified prior to funding.

We also have concerns about the potential for domestication selection in the kelt reconditioning program that were not adequately addressed in the proposal, the response, or the 3-Step Scoping Document. The discussion of domestication in the Scoping Document (pp 18-19) assumes that domestication selection will operate at a very low level, if at all on kelts. This may or may not be true, but at this point, is an untested assumption. It is entirely possible that failure to recondition and subsequent mortality on the part of some kelts is a response to the artificial hatchery environment, meaning that within the remaining cohort of kelts, some level of artificial selection has indeed occurred.

Finally, also in the 3-step review material, but pertinent to the final project proposal review, sponsors defined carrying capacity by the size of the returning run. However, carrying capacity is defined by the habitat and not by the run size. More thought needs to be applied to this question including after the present 3-year study, incorporating natural production via reconditioned kelts back into system carrying capacity estimates, and scaling more traditional hatchery-produced steelhead juvenile releases to levels consistent with the expected increase in natural production.

ProjectID: 35014

Measurement of Quantitative Genetic Variation Among Columbia River Basin Chinook Propagation Programs

Sponsor: CRITFC

FY03 Request: \$313,855 **5YR Estimate:** \$914,623

Short Description: To investigate the existence of genotype-environment interactions in salmon, the building block of local adaptation, and thus refine the concept of conservation units.

ISRP Final Comments:

Fundable at a medium priority. We agree with the CBFWA review and middle ranking of "High Priority." This proposal involves the application of quantitative genetic and molecular genetic methods in the "search for significant genotype x environment interaction and stock effects. The presence of such effects would presumably denote different distributions of quantitative variation among life history types and geographic regions spanning the range of chinook salmon within the Columbia River Basin." The proposal is well presented and would provide one of the very few studies assessing the quantitative genetic basis to phenotypic variation in life history traits in the basin. In particular, the research proposes a study (involving a half-sib breeding design) to assess Genotype x Environment (GxE) interactions in traits associated with early development, coupled with DNA analyses to assess genotypic changes between the family parentages and the surviving progeny. If GxE interactions were strong, then selection for genotypes in different environments

would be predicted. However, if GxE interactions are insignificant, then one or a few genotypes may be best in all environments.

The authors considered each of the ISRP's preliminary review comments and have strengthened their proposal. Project sponsors propose to change the breeding design to a factorial design capable of estimating interactive effects, and discuss the changes this will entail within the available facilities. The duration of the project has been shortened. The basic notion here that variation of survival during embryogenesis among families would be related to variation of other fitness traits in later development is still a concern, but we understand the notion that variation of development time may be an important component of adaptation to local environments by chinook in the basin and that this study of high altitude and low altitude spawning populations might elucidate an important mechanism of adaptation.

No doubt the region will learn from this investigation, but we continue to wonder if more could be learned with the inclusion of molecular data. If the genotype of each individual can be assessed (presumably across families and stock), a more direct test of genotype x environment interactions would seem to be to relate "type" to performance -- more of a regression analysis (common in quantitative genetic studies for GxE).

ProjectID: 198909600

Monitor and evaluate genetic characteristics of supplemented salmon and steelhead

Sponsor: NMFS

FY03 Request: \$593,900 **5YR Estimate:** \$2,548,570

Short Description: Direct and indirect estimates for reproductive success. Estimate selection gradients in hatchery and wild. Monitor changes in hatchery, natural (supplemented), and wild (un-supplemented) populations. Evaluate effectiveness of hatchery supplementation.

ISRP Final Comments:

Fundable. We agree with the CBFWA review and the Urgent priority ranking. This is an excellent, important, and well-written proposal. The researchers have maintained a very high level of scientific productivity. A response was not needed; however, the project sponsors subsequently responded thoughtfully to the preliminary ISRP review comments.

The proposal provided summary statements of findings that showed significant progress over the history of the project. Several papers based on the results have been published in peer-reviewed journals, which indicate acceptance of the work by the scientific community. The study continues to make an important contribution to the understanding of the genetic structure of Columbia River anadromous salmonids.

Expansion of the budget is explained and justified. It includes both an actual expansion of the data collection and lab analysis to the Lostine River, Catherine Creek, and Little Sheep Creek steelhead, as well as expanding the project to include the development of pedigree analysis and a strategy shift to increasing reliance on microsatellite DNA analysis rather than allozyme analysis. In particular, the latter change is justified and warranted. Shifting to the pedigree/paternity analysis is needed in order to investigate the more subtle effects of hatchery/wild fish interactions through supplementation to which the allozyme results were relatively insensitive. Microsatellite DNA pedigree analysis should be insightful for this purpose. At the same time, continuing the allozyme data collection at a base level is warranted in order to retain continuity of data over time (nearing two decades).

If funded, this project should be coordinated with other monitoring projects to ensure compatibility of objectives, common methods, and protocols. This coordination could be accomplished under the favorably reviewed CBFWA proposal #35033.

ProjectID: 199105500

Natural Rearing Enhancement Systems (NATURES)

Sponsor: NMFS

FY03 Request: \$1,158,969

5YR Estimate: \$5,711,234

CBFWA Adjusted FY03: \$559,800

3YR: \$1,737,200

Short Description: Evaluate NATURES effects on salmonid behavior, morphology, physiology, post-release survival, and ecological interactions.

ISRP Final Comments:

Fundable at a low/moderate priority. We disagree with CBFWA's Urgent ranking; this should be lower priority. In regard to potential elimination of Objective 1, this is the component that raised the most ISRP concern and debate (this debate resulted in a strong experimental design); however, Objectives 2-4 as reflected in CBFWA's comments are of higher regional priority than Objective 1. Objective 5, regional consultation, is not discussed in enough detail in the proposal to assure its benefits, although the NMFS group was instrumental in developing the NATURES concept.

This proposal would continue evaluations of NATURES effects (semi-natural rearing of fish in hatcheries) on salmonid behavior, morphology, physiology, post release survival, of these hatchery fish and their ecological interactions with wild fish.

The current proposal has two major foci. Objectives 1 and 2 test NATURES rearing habitat components (cover, structure, and substrate) at production hatchery scale and to determine interaction effects between rearing habitat variables assessed based on smolt-to-adult survival (design to detect a 20% difference between treatments with 80% power), and secondly to investigate benefits of predator conditioning to juvenile migratory and adult survival (same power). Research under Objectives 3 and 4 is intended to help determine ecological risks and benefits of release of NATURES reared under yearling steelhead to cohabit stream environments with wild cohorts (steelhead and spring Chinook). The latter studies are to be conducted in experimental channels and observation flumes already available at NMFS facilities.

The proposal presents results of past studies and suggests that in-stream post-release survival of fish reared in these special habitats is significantly greater than that of their counterparts reared conventionally. These statements, however, are based on relative survival of NATURES reared-fish compared to conventionally reared hatchery fish and have not yet compared survival to adult returns. The studies in 1997-2000 included components to evaluate survival to adult returns.

While we acknowledge the efforts in these past studies, the ISRP believes it is important to keep these past results in proper perspective. In the summarized studies, the average improvement in survival (NATURES vs. conventional) is +18% (range +1% to 50%, n = 7 years). Given that smolt-to-adult survival for hatchery fish has frequently been <1%, these improvements (based on short-term smolt survival only to-date) are inadequate to provide the substantial improvement in survival needed for recovery or improved economical value of these hatchery fish. It is essential that these 1997-2000 studies be reported as the data is available in order that any improved benefits to the adult stage may be accounted for.

The project sponsor's response did not adequately address several of the ISRP's preliminary criticisms. The experiment at Carson should be restricted to three brood years; the loss of power will be marginal, and the results of other studies within (Cle Elum) and outside (Puget Sound) the Basin will be available to compensate for the loss of power. This shift to evaluation studies at production facilities in the basin that are employing NATURES techniques could be assisted through oversight by the proposers to standardize experimental rearing approaches among the various facilities and coordinate data collection and analysis (as proposed in Objective 5).

The response does not provide any current data on smolt to adult survival rates associated with NATURES within the Basin and now concur that the expected benefits of NATURES may be small as currently estimated based on juvenile survival differences. The proposers note that incomplete returns to a study in Puget Sound at Forks Cr (lacking 5 yr old return) show an advantage in marine survival of NATURES-reared smolts (0.0595% vs 0.0514%). These are obviously small differences in marine survival rates and may be statistically indistinguishable from one another.

The ISRP commented that the project had thus far generated few peer-reviewed publications (in contrast, for example, to the NMFS Captive Brood Research program). In the proposal the authors credit themselves with a good publication list, but upon inspection of those publications there are really only 4 papers in recognized primary journals (4 of 32 listed). There does not seem to be any primary paper actually on the NATURES rearing studies? In their response the proposers say they're working on it; this is not responsive. This criticism has been leveled in earlier reviews and there continue to be no peer-reviewed publications of analyses of the elemental features of Natures.

The ISRP was concerned that sample sizes of 100 may not be adequate to describe variances of body size, etc. and that larger sample sizes may be necessary. The proposers did not respond to the question. The review suggested an investigation of how the precision of estimates of variance would improve with increased sample size, but the response seemed to infer that the criticism was about the ability to collect unbiased samples from raceways with structure in them.

The ISRP commented that mass-marking and selective fisheries on marked fish may bias results. The proposers responded that there will be intensive sampling to discover wire tagged fish among harvested fish and at the rack and that the bias will effect all treatment groups and controls similarly and that the effect on expected recoveries has been accounted for in the experiment design.

ISRP concerns about how the numbers of animals released were determined and at what density the animals were reared were answered adequately. The ISRP also had concerns that the budget was unjustified and apparently over estimated. The proposers explained the differences in the budget adequately.

An important outstanding issue remains: the ISRP's suggestion that the project could be reduced from 5 to 3 years of releases without a significant loss of power. In the proponents' response, they calculate that statistical power to detect a difference between treatments would be reduced from 0.87 to 0.65 by reducing the releases to 3 years. They argue this is unacceptable as it is below the design standard of 0.8 (based on detecting at least a 20% difference between rearing treatments at a 95% confidence level). While the ISRP agrees with the technical basis for this argument, the basis of our concern was the relative benefit (modest at best) achieved for the substantial expense of an additional two years of rearing releases. The reason a 5-year treatment plan is supported by the NMFS sponsors is that they are trying to measure a small difference

among treatments with very high confidence. Such precision may be not warranted, given the small potential biological benefits observed to date between treatments.

A larger concern is whether supporting the proposed project at all is warranted given issues of best use of funds, given the expected modest gains from this investment, and the information that will be available near term from other application of the NATURES rearing approach within (e.g., Cle Elum) and outside (Puget Sound) the basin. The proposed value of this specific project was a production-scale test of the NATURES rearing approach conducted within a rigorous experimental design. Implementation of NATURES rearing approaches to supplementation in the Yakima and Clearwater systems are in fact now applying NATURES at production scales. Because of this mismatch in timing between the Carson facility research project and the implementation of NATURES rearing at other sites, the main benefit that would arise from this proposal would be measurements of the relative contributions and interactions among elements of the NATURES treatments (cover, rearing substrates, rearing densities, exposure to predators).

In making a final determination, Council should be advised that this NATURES proposal is a well-designed experimental assessment of NATURES treatments intended to inform subsequent application of the NATURES approach to supplementation and production programs. However, implementation of NATURES rearing treatments in the Basin has preceded this experiment already, but this study could still improve the efficiency of these applications. We should note, however, that there is general agreement that the relative benefits of NATURES rearing alone, are likely to be relatively small. As the sponsors state in their response to the ISRP comments (August 21, 2002 letter):

“In regards to concerns that NATURES alone may be “inadequate to provide the substantial improvement in survival needed”, we too believe that we must be realistic about our expectations. There is no one “silver bullet” that will by itself restore the Region’s anadromous salmonid resources. The most likely scenario is that recovery will be accomplished by threading together many “modest increases” in survival, such as those potentially offered by NATURES.”

If funded, this project should be coordinated with other monitoring projects to ensure compatibility of objectives, common methods, and protocols. This coordination could be accomplished under the favorably reviewed CBFWA proposal #35033.

ProjectID: 199305600

Assessment of Captive Broodstock Technologies

Sponsor: NMFS

FY03 Request: \$1,498,981

5YR Estimate: \$8,282,813

CBFWA Adjusted FY03: \$1,468,100

3YR: \$4,631,300

Short Description: Develops technologies to improve genetic integrity, inculture survival, maturation, and reintroduction success of ESA-listed salmon captive broodstocks. Applies research on physiology, behavior, genetics, ecology, microbiology, and nutrition.

ISRP Final Comments:

Fundable. We agree with the CBFWA review and Urgent ranking. This complex multi-faceted proposal represents a disciplined aggressive attack on many of the key uncertainties associated with captive broodstock use. The proposers responded carefully to previous ISRP concerns and review comments. The proposal contains extensive documentation from the general fisheries literature, as well as relevant Columbia River basin gray literature. The proposal also contains substantial methodological detail. This ongoing FWP project has an impressive list of

accomplishments since 1994 and may be one of the better FWP projects in terms of publication of results in peer-reviewed scientific journals.

This proposal continues the development of technologies to improve genetic integrity, in-culture survival, maturation, and reintroduction success of ESA-listed salmon captive brood stocks. Research is conducted on physiology, behavior, genetics, ecology, microbiology, and nutrition and the captive brood fish and their re-introduction to the natural environments (from authors' short description).

The five objectives of the project are as follows

1. Improve reintroduction success
2. Improve olfactory imprinting and homing
3. Improve physiological development and maturation
4. Improve in-culture survival through prevention and treatment of disease
5. Evaluate effects of inbreeding and inbreeding depression

Each of these is a relevant and necessary aspect of the captive brood technology, and the authors have an excellent scientific record of publication on these works (28 primary publications based on past work).

Nevertheless, the ISRP has several concerns with this large complex project. While the proposal is a substantial improvement over its predecessor, it is very large and needs clarification or restructuring so that the individual studies can be thoroughly reviewed. The scope of this program and importance of the work to the conservation of these stocks might justify a more in-depth scientific review of this one project alone, not as one of 104 projects in this review.

The sponsor's response was adequate to address the ISRP's concerns raised in the preliminary review. However, the response on the release of captive reared fish to breed with wild fish (in Idaho) was in essence that this was a policy decision by the state and tribal managers rather than a decided part of the research project and an action currently being implemented, albeit on a small scale. Thus attention to it as a research component by this project was appropriate. While all of this is logical, it sidesteps the issue of whether this is an appropriate release strategy for these endangered and valuable stocks without significantly more research conducted under controlled conditions first.

If funded, this project should be coordinated with other monitoring projects to ensure compatibility of objectives, common methods, and protocols. This coordination could be accomplished under the favorably reviewed CBFWA proposal #35033.

ProjectID: 199606700

Manchester Spring Chinook Broodstock Project

Sponsor: NMFS**FY03 Request:** \$950,000**5YR Estimate:** \$4,828,825**CBFWA Adjusted FY03:** \$877,600**3YR:** \$2,436,800

Short Description: Smolt to adult seawater rearing of spring and summer chinook salmon broodstocks from Idaho's Salmon River and Oregon's Grande Ronde River sub-basins. Provides adult fish for spawning or direct release in recovery programs for ESA-listed stocks.

ISRP Final Comments:

Fundable. We agree with the CBFWA review and Urgent ranking. A response was not needed.

This project is designed to develop and maintain captive broodstocks of chinook salmon in saltwater at Manchester, WA. It is needed to support many other projects and to meet ESA requirements on several upper basin listed stocks. The proposal is thorough with respect to hatchery procedures and describes the scientific and technical background of the problem, including a discussion of the potential risks and benefits of captive broodstock techniques. It clearly relates to a regional need and has strong connection to other projects.

This proposal continues the smolt-to-adult seawater rearing of spring and summer chinook salmon brood stocks from Idaho's Salmon River and Oregon's Grande Ronde River subbasins. Adult Chinook are provided for spawning or direct release in recovery programs for ESA-listed stocks. The proposal includes a request for \$200,000 capital for improvements to the Manchester saltwater delivery system (cost shared with NMFS). The proposal provides explanation for the increased costs relative to previous projections including the need to improve the saltwater system, but it does not provide any explanation concerning the substantial increasing costs in the operating fund through to 2007.

The proposal is generally well written and includes some data on past performance of the rearing program. The rationale and relationship of the program to other Basin programs were good, and the authors are preparing written protocols for all aspects of the captive rearing programs.

However, one omission would seem to be the M&E ... of which there is none. Obviously there is monitoring since growth and survival of the animals in culture is being assessed; however, in a program with such intensive culture of such small numbers of original animals, reviewers would also be concerned about genotype x environment interactions and the survival of these fish after release into the wild. It does seem surprising that no monitoring of this aspect is being undertaken given that NMFS seems to be measuring DNA in every other salmonid in the Basin. The survival in the culture systems is quite high so people may argue there is no need to conduct such monitoring but there could be significant differences in how certain genotypes respond to the culture system and how they respond to the reintroduction to the wild. Is this being assessed by other programs or should it be implemented?

Secondly, given the difficulties being encountered in reintroducing adults into the Idaho streams (in proposal #199305600) and the known depressed state of production in the Grande Ronde populations, is there a need to complete the "safety net" by maintaining true captive brood stocks (multiple generations) in these remote rearing sites (i.e., should live-gene bank programs be established)? Why has this rather obvious step not been undertaken? Its absence suggests that a decision has been made not to do this.

Another uncertainty with the project that concerns reviewers relates to the outcomes of the project with respect to the reproductive performance of the adult fish after they are released back into natal streams for spawning. Another is whether the fish surviving to be outplanted as adults constitute a representative sample of the initial broodstock population with respect to genetics and fitness attributes.

Propagating captive broodstock as a protection measure under ESA cannot be viewed as a long-term strategy. Many problems are inherent in such propagation -- a program that is not ultimately consistent with the needs of endangered species. The authors of this proposal seem to be aware of these problems and have included a discussion of several in their proposal.

If funded, this project should be coordinated with other monitoring projects to ensure compatibility of objectives, common methods, and protocols. This coordination could be accomplished under the favorably reviewed CBFWA proposal #35033.

ProjectID: 35012

Spatial scales of homing and the efficacy of hatchery supplementation of wild populations

Sponsor: NMFS

FY03 Request: \$370,100 **5YR Estimate:** \$1,545,100

Short Description: Determine the spatial and temporal patterns of homing and spawning by wild and hatchery-reared salmon released from supplementation facilities and examine the physiological changes in the olfactory system during imprinting.

ISRP Final Comments:

The project is fundable at a moderate priority. We agree with the CBFWA review and middle ranking of High Priority. The project supports (and is dependent on) the Yakima Spring Chinook salmon supplementation program (Cle Elum Hatchery), and the proposed research is suggested to be useful for the biologists operating the YKFP supplementation program. In particular, this study will examine the effectiveness of supplementation and releases from satellite facilities for facilitating successful imprinting, minimizing straying, and contributing to wild salmon recovery.

The courteous response adequately addressed all of the ISRP's preliminary concerns, but the results of this fieldwork will be very weather dependent (modest-high risk). It was unclear whether the Yakamas support the proposed work. The Yakama investment in supplementation and acclimation sites has been extensive and this project could be useful in "tuning" their program to be more successful in seeding spawning habitat.

If funded, this project should be coordinated with other monitoring projects to ensure compatibility of objectives, common methods, and protocols. This coordination could be accomplished under the favorably reviewed CBFWA proposal #35033.

ProjectID: 35049

A multiscale evaluation of steelhead supplementation in the West Fork Elochoman River

Sponsor: NMFS

FY03 Request: \$683,324 **5YR Estimate:** \$3,278,533

Short Description: Evaluate the effects of the release of hatchery-reared steelhead on the growth, survival, movement, and behavior of wild salmonids in the West Fork Elochoman River.

ISRP Final Comments:

Fundable at moderate priority; we disagree with the CBFWA High Priority ranking and recommend a lower priority. This proposal would evaluate the effects of the release of hatchery-reared steelhead (early summer release of yearlings) on the growth, survival, movement, and behavior of wild salmonids in the West Fork Elochoman River. This may be a good approach to assessing the “conservation” hatchery concept, but does it have the priority to merit this level of funding? This would be a very in-depth assessment with modest risk of failure due to working in the natural environment, but it would provide a critical and biologically based assessment of supplementation.

It is very likely that a five-year study of steelhead in natural systems will have setbacks due to annual variation in weather, etc. However, this is the type of study that is needed to fully assess the utility of supplementation. There is clearly a modest risk that natural variability will limit what is learned from such an investigation, but these are the risks we need to take.

The sponsors systematically addressed all ISRP preliminary concerns; however, answers were concise if not superficial, and did not provide adequate detail to instill confidence that the experimental aspects of the project are well thought out and likely to succeed. If funded, this project should be coordinated with other monitoring projects to ensure compatibility of objectives, common methods, and protocols. This coordination could be accomplished under the favorably reviewed CBFWA proposal #35033.

ProjectID: 199009300

Genetic Analysis of *Oncorhynchus nerka* (modified to include chinook salmon)

Sponsor: U of I

FY03 Request: \$126,436 **5YR Estimate:** \$518,756

Short Description: This ongoing project provides genetic information to assess immediate and long-term genetic risks to federally endangered Snake River sockeye and threatened Salmon River chinook salmon currently in artificial production programs.

ISRP Final Comments:

Fundable. We agree with the CBFWA review and Urgent ranking. This is clearly high priority work that warrants continued funding. The proposal is well written. The project addresses the genetic variation in Columbia River sockeye salmon, particularly in the listed stock (Redfish Lake) and its captive breeding program, plus the impact of captive rearing on three listed chinook salmon populations. These populations are severely depressed and require careful genetic monitoring to maintain the remaining genetic variation. This project also monitors the bycatch of sockeye salmon in a sport fishery for kokanee in Redfish Lake and has demonstrated the bycatch of anadromous or residual sockeye. While this concern is not the responsibility of this project, it is a concern that in a lake with a listed sockeye salmon stock, at an extremely depressed population size, that a kokanee fishery would be allowed at all. The ISRP remains concerned about what impact is allowed on sockeye in this fishery and how is it justified?

The proposal has a long term monitoring component that is needed to provide consistency and insights into the Redfish Lake sockeye captive broodstock effort. The proposal also provides additional information on reports and publications that have resulted from this study (and related ones) to address some of the ISRP's FY00 review comments. One hopes that with the long-term dataset that is being generated by this study that additional peer-reviewed publications will arise from the work. The project sponsors provided a thorough response that adequately addressed the ISRP's preliminary review questions, including additional description and details on the recent use of microsatellite loci analyses to develop pedigrees, identify parentage, and to set up MAI (Maximal Avoidance of Inbreeding) matrices to guide captive breeding options for severely depressed chinook populations in the East Fork of the Salmon and West Fork of the Yankee Fork.

ProjectID: 35015

Replicated stream system for the evaluation of hatchery and wild juvenile salmonid interaction and development of innovative culture technologies

Sponsor: UI/CRITFC

FY03 Request: \$300,114 **5YR Estimate:** \$2,392,840

Short Description: Develop sixteen independent streams using spring water at the University of Idaho Hagerman Research Station with the goal of providing a research facility for investigating interaction between wild and hatchery salmonids and rearing technique development.

ISRP Final Comments:

Do Not Fund. We disagree with the CBFWA ranking of high priority. The proposal focuses on an important opportunity for a unique aquaculture research facility in southern Idaho at the University of Idaho's Hagerman Experimental station and a new acquisition on the nearby Billingsley Creek. However, we do not support the proposed initial use: construction of a series of replicated streams on the Billingsley Creek site. While the project sponsor provided a detailed response to the ISRP preliminary review comments, we continue to have a fundamental problem with building a research facility without identifying the research to be conducted. The ISRP recognizes the potential value of this site, understands that the facility is under the care and ownership of the University of Idaho, and believes the site offers potential as a regional aquaculture research facility. It seems logical therefore, to regionally solicit input and identify aquaculture and conservation research needs and interest on the part of potential participants and funding agencies before proposing construction of a specific aquaculture facility design.

The requested evidence of regional support for the facility (three letters attached to the response) acknowledged the potential value of such a facility, but the letters were certainly not extensive responses, nor convincing in arguments. Further, despite the ISRP's suggestion, the response did not present a more basic research proposal.

ProjectID: 200000700

Infrastructure to Complete FDA Registration of Erythromycin

Sponsor: UI-CNR

FY03 Request: \$166,419

5YR Estimate: \$514,419

CBFWA Adjusted FY03: \$160,919

3YR: \$450,919

Short Description: Continue to provide agencies and tribes access to erythromycin feed additive while working to complete FDA approval of erythromycin feed additive, a therapeutic needed for sustained hatchery production and maintenance of captive broodstocks of salmon.

ISRP Final Comments:

Fundable, high priority. We agree with the CBFWA review and Urgent ranking. The tasks included are required by the FDA to allow continued use of erythromycin for salmon. This

proposal seems to be a comprehensive response to FDA and proposes to maintain close interaction with the FDA in completion of this work. The principal investigator has a long productive history in this issue and has the necessary facilities and credentials to proceed. In the absence of different treatments for BKD, there is no other option but to proceed and meet the FDA requirements.

ProjectID: 35027

Evaluation of Two Captive Rearing Methods for Assisting with Recovery of Naturally Spawning Populations of Steelhead and Coho Salmon

Sponsor: USFWS

FY03 Request: \$472,941

5YR Estimate: \$2,046,091

CBFWA Adjusted FY03: \$396,116

3YR: \$932,966

Short Description: Test and evaluate two hatchery reform methodologies; Assess natural reproductive success of returning hatchery-origin adults; Establish Abernathy, Germany, and Mill creeks as a Tier 3 "monitoring and evaluation" site for anadromous salmonids.

ISRP Final Comments:

Fundable. We agree with the CBFWA review, budget reductions, and Urgent ranking. This is a strong proposal that the ISRP has reviewed twice prior to the Mainstem / Systemwide provincial review. Each time we have supported it, as we do now. The proposal has four components: the steelhead brood stock study, rearing of coho salmon in the hatchery to reduce over-winter mortality, replacement of the electronic fence in Abernathy Creek, and the development of a Tier 3 Monitoring and Evaluation Site (NMFS RPA No. 183) for Lower Columbia and Southwest Washington ESUs of steelhead, coho salmon, chinook salmon, and coastal cutthroat trout.

The authors' propose to assess the use of juveniles, rather than adults, to initiate local brood stocks for supplementation programs. Removing juveniles would impose less of a demographic loss on a depressed population and may reduce the risk of a Ryman-Laikre effect on the genetic composition of the population (i.e. the expansion of a small sample of the population into a much larger portion of the supplemented population with associated changes in genetic variation).

In our preliminary comments, the ISRP took the unusual step of providing detailed suggestions on study design modifications to the project sponsor, as this is the third time we have considered this proposal. The project sponsor's response to the ISRP preliminary concerns was adequate and demonstrated full consideration of the ISRP comments. The sponsors modified the proposed design to address ISRP concerns so that the proposed monitoring now includes both natural and cultured populations.

We also note that there is a strong cost sharing aspect to the program as WDFW will provide three rotary screw traps, and USFWS is proposing to recruit additional staff and has the facilities to conduct the proposed work. If funded, this project should be coordinated with other monitoring projects to ensure compatibility of objectives, common methods, and protocols. This coordination could be accomplished under the favorably reviewed CBFWA proposal #35033.

ProjectID: 35060

Instream evaluation of populations, migration, individual adult return and wild-hatchery interactions of naturally produced salmonids

Sponsor: USFWS

FY03 Request: \$229,606 **5YR Estimate:** \$964,645

Short Description: Evaluate stock status, distribution, and abundance of juvenile and adult salmonids using new PIT tag techniques.

ISRP Final Comments:

Fundable at a medium priority. We agree with CBFWA's review and middle ranking of High Priority. A response was not needed. The proposed project seems like a logical extension of the previously funded innovative project. This is the second time we have reviewed this proposal recently. The value we see in this work is in Objective 1: to assess "abundance and natural production of juvenile, smolt and adult salmonids while developing and providing standard protocols for stock monitoring programs." If standard methods, tools, and protocols can be established for small stream assessments in the Basin, this could have significant general value outside of the immediate stream. We encourage the proponents to prioritize their work with emphasis on population assessment methods and sampling protocols.

The project sponsor has made a significant contribution through her work to develop stationary remote and portable detectors for PIT tags, and is now developing a proposal to utilize that technology. However, in reviewing the objectives of this proposal, their value to the region seems limited to the development of sampling protocols for small stream assessments (useful), examination of tagging impacts on growth (assessed within a hatchery environment and with hatchery fish ... limited value), or otherwise mostly of local value in Abernathy Creek.

If funded, this project should be coordinated with other monitoring projects to ensure compatibility of objectives, common methods, and protocols. This coordination could be accomplished under the favorably reviewed CBFWA proposal #35033.

ProjectID: 35063

Compare Bacterial Fish Pathogen Populations in Hatchery Water and in Adjacent Creek Water and Evaluate Possible Disease Transfer Between Them.

Sponsor: USFWS

FY03 Request: \$71,678 **5YR Estimate:** \$106,165

Short Description: Determine the presence of bacterial fish pathogens within a hatchery water system and in the waters of an adjacent creek used as part of the hatchery water supply. Determine the potential for pathogen transfer between the two water systems.

ISRP Final Comments:

Do Not Fund. We disagree with the CBFWA Recommended Action ranking. The same proposal was reviewed by the ISRP recently and given a Do Not Fund recommendation. Other than the addition of a summary of the investigator's qualifications and a paragraph suggesting which textbook the statistical test may be drawn from and that an unnamed statistical consultant would be sought (but giving no sampling designs, etc.), we see very little basis for changing the past assessment. With the information provided, the ISRP is not confident that the proposal will answer the question it proposes to answer. This proposal would investigate the possible exchange, between hatcheries and the environment, of two of the most serious bacterial diseases found in salmonid hatcheries of the Pacific Northwest, Bacterial Cold Water disease and

Furunculosis, caused by *Flavobacterium psychrophilum* and *Aeromonas salmonicida*. Coho and steelhead are most susceptible but other salmonid species can be infected or act as carriers. These diseases are not limited to hatchery fish but also occur among wild populations. The proposed work could complement a similar proposal (#35039, USGS-CRRL) but the content of this proposal is very limited.

ProjectID: 198740100

Assessment of Smolt Condition: Biological and Environmental Interactions

Sponsor: USGS, CRRL

FY03 Request: \$256,000

5YR Estimate: \$1,781,050

CBFWA Adjusted FY03: \$187,000

3YR: \$849,000

Short Description: Provide research support to regional hatchery and fishery managers to determine interactions between juvenile salmonid physiological development and the environment that affect smoltification, disease resistance and smolt-to-adult returns.

ISRP Final Comments:

Fund in part (qualified). Agree in part with CBFWA's High Priority ranking. The annual ongoing tasks concerning smolt condition or quality, clearly identified in a project designed to directly assist facility managers, appear fundable. However, regional support needs to be demonstrated that this is a needed ongoing required task. The sponsor's proposal to begin a major new project on environmental determinants of early development of the immune system may be valuable; but the Council should understand what it is supporting. A well-designed experiment on this issue could have significant scientific value, but an adequate design is not provided in the proposal or response.

The research topic is interesting and the researchers have a long history of working with smolt monitoring in the basin. They are well qualified to conduct this research but the descriptions of methods and tasks are inadequate. This proposal is putatively developed from a continuing task in the basin, but appears largely to be about developing a new research topic.

It is worth noting that the CBFWA reviewers raised many of the same concerns as the ISRP about whether this represented evolving ongoing work, or a new proposal.

CBFWA: There appears to be a significant change in scope for this ongoing project. There was some question whether this project should be viewed as a new proposal, rather than an ongoing, planned study as originally proposed. The proposal is taking on a new path in developing its own study design and research plan. The ISRP has raised significant concerns regarding the study design. Some of the CBFWA reviewers agree with their concerns and will provide additional comment.

The ISRP's preliminary comments noted that the new portion of the proposal needed to be separated from the ongoing portion of the proposal, the new portion needed to be justified as to why it was appropriate as an extension of "smolt condition", and it needed to be supported by an appropriate experimental design (including clarification of the genetic issues). The response failed to provide adequate detail on the ISRP preliminary concerns about study methods, statistical design, and additional information on the intention and value of the genetic screening. Also in their response, project sponsors strongly disagreed with the ISRP and CBFWA assessment that the proposed research is new, and should be separated from their continuing provision of smolt assessments.

ProjectID: 35039

The influence of hatcheries and their products on the health and physiology of naturally rearing fish

Sponsor: USGS, CRRL

FY03 Request: \$303,448 **5YR Estimate:** \$2,375,918

Short Description: This research will determine whether standard hatchery or supplementation operations influence the concentration of *Renibacterium salmoninarum* in streams and subsequently affects the health of naturally rearing salmonids

ISRP Final Comments:

Fundable. We agree with the CBFWA review and High Priority ranking. This is a well-designed program that will address three major issues: 1) do hatcheries amplify the presence of *Renibacterium salmoninarum* (Rs) in the wild (water and fish); 2) do hatchery juveniles with high Rs levels pose a risk to wild juveniles (tested in artificial stream tanks); and 3) do carcasses outplanted for nutrient supplementation pose a Rs risk to the natural environment. There are two issues to note: the methodology for detection of Rs in large water samples is uncertain (but expected to be functional within a year), and several aspects of objective 3 depend on the freezing treatment of carcasses. For the latter, if freezing does kill the Rs bacteria then the remainder of objective 3 tasks (3b-3h) will not be conducted (requiring a budget adjustment).

The response was adequate for both the ISRP and RME concerns. Project sponsors explained the status of developing an Rs detection method and what it will likely be. They provided justification for the tentative choice of hatchery sites and demonstrated how regional input will be used in the choice. They explained the nature of the raceways to be used and indicated their intended methods of statistical analysis.

ProjectID: 35037

Measuring the potential for domestication selection of spawn timing in chinook captive and supplementation programs; implications for recovery.

Sponsor: UW and NMFS

FY03 Request: \$129,498 **5YR Estimate:** \$718,893

Short Description: Analyze the genetic response to (and recovery from) inadvertent domestication selection for spawn timing in supplementation and captive programs, using quantitative genetic approaches to trend analysis

ISRP Final Comments:

Fundable at high priority. We disagree with CBFWA's "Recommended Action." The development of a quantitative genetic program in Pacific salmon is a welcomed and needed addition to the Fish and Wildlife Program. Domestication is a real concern in the use of artificial propagation and merits direct study. Changes in return timing/spawn timing are known to result from artificial propagation and domestication selection. Studies such as these will be essential to truly understand the degree of risk imposed by hatchery programs and practices.

The proposal involves a 3-generation directional selection experiment to study the response to selection for run timing and correlated traits in chinook salmon. Three independent lines of Chinook would be initiated from a single starting population (early timing, late timing, and control lines) and each line would be subjected to captive rearing (sea pen rearing to maturity) and released to the wild (i.e., similar to a hatchery supplementation program). The ISRP initially identified three concerns about the design; these included the choice of the species used, a potential bottleneck in the expected returns of age-3 chinook, and the ability to identify families

within lines. The authors' responded to each, but the ISRP continues to have concerns for the first two items. The third involving family identification was adequately clarified (through the use of DNA sampling and coded-wire tags).

The response to using chinook salmon involved their objective to study correlated changes in maturation rates at age in lines selected based on run timing. The ISRP accepts this response, but notes that using chinook presents difficulties in the experimental design (authors' provided a detailed diagram of the experiment) and a long time period for completion of the study. Less complex designs with shorter-lived salmon (coho or pink salmon) could be as informative and provide useful results within ten years. Studies of correlated responses could still be conducted on other traits (e.g. size at maturity, growth rate, fecundity). Further, the space required for these species may be more consistent with that available, and if coho salmon were used their survival rate would likely be sufficient to maintain a reasonable selection differential in the selected lines.

An associated concern about using chinook salmon may simply be unavoidable. The issue involves the development of the selected lines in the second-generation returns. Given the expected survival rate and maturation rate of the chinook stock used, there will likely be a limited number of Age-3 mature chinook returning from the line released to the wild. The authors also acknowledged this concern. However, if a substantial bottleneck did occur, then the DNA sampling would provide a good sampling tool to monitor the impact and additional insight could result. Further, even if this problem resulted in a loss of an age-selection line, there would be substantial returns of Age-4 chinook to maintain the selection line without compromising the main objective of the study. The ISRP also discussed the relative risk of this happening versus the value of undertaking such experiments. We strongly support undertaking these studies and accepting the risk of the Age-3 bottleneck issue.

The ISRP also considered further the comments of the NMFS RME groups, and would suggest that they significantly underestimate the potential value of such quantitative genetics research. Many of the issues that people have speculated about concerning hatchery domestication and impacts on fitness continue due to the lack of direct investigation. Only through the use of quantitative genetic studies and/or DNA analyses (or both) can these issues be truly investigated. The addition of this research facility and the development of the University of Idaho/CRITFC facility are essential and much needed additions to the Fish and Wildlife Program!

ProjectID: 35041

Monitoring the reproductive success of naturally spawning hatchery and natural spring chinook salmon in the Wenatchee, Tucannon, and Kalama Rivers

Sponsor: WDFW, NMFS

FY03 Request: \$1,079,140

5YR Estimate: \$5,619,585

CBFWA Adjusted FY03: \$830,474

3YR: \$2,946,438

Short Description: Evaluate the relative fitness (mating success and progeny survival) of hatchery and wild spring chinook that spawn naturally in rivers

ISRP Final Comments:

Fundable. We agree with the CBFWA review and Urgent ranking. The proposal will evaluate the relative fitness (mating success and progeny survival) of hatchery and wild spring chinook that spawn naturally in rivers using DNA analyses proposed in several other projects as well. The proposal is well written and appropriate background is presented. The critical uncertainty about differences in fitness between wild and hatchery-produced fish lies at the heart of most of the ongoing and proposed research into captive brood and supplementation technology, and

seemingly at the core of RPA 182 also. Indeed, understanding differences in fitness between the two groups, and whether conservation-oriented hatcheries and hatchery practices can produce fish that can integrate into natural populations and lead to long-term sustainability (i.e., the fitness question) is the primary question around which much of the present recovery plan hinges.

Project sponsors provided thoughtful and adequate responses to the ISRP preliminary questions, including discussion of the expected research contributions from each of the three proposed study sites, the Wenatchee, Tucannon, and Kalama Rivers. The Wenatchee system seems well suited to the sampling; the other two are less so, as the sponsors acknowledge.

If funded, this project should be coordinated with other monitoring projects to ensure compatibility of objectives, common methods, and protocols. This coordination could be accomplished under the favorably reviewed CBFWA proposal #35033.

ProjectID: 35029

Transfer IHN virus genetic strain typing technology to fish health managers

Sponsor: WFRC

FY03 Request: \$116,479

5YR Estimate: \$470,486

Short Description: Application of new genetic strain typing technology to epidemiology of IHN virus throughout the Columbia River basin, and transfer of technology to agency fish health laboratories.

ISRP Final Comments:

Fundable. We disagree with the CBFWA priority; this should be urgent. This is a well-written proposal from scientists who demonstrate high productivity and application of current methodologies. Their proposal for technology transfer is strengthened by their past success. The model transfer of IHNV strain typing technology to fish health labs serving the basin may serve for other significant pathogens.

The project sponsors provided an adequate response to the ISRP's preliminary review concerns. The proposers will incorporate repeated blind testing of virus isolates into the protocol without an increased budget. Prevention of virus spread and control of outbreaks will result from educated management decisions enabled by the project. Active control was an intended part of the proposal as submitted and the response convincingly explains that increased effort beyond that budgeted in the proposal will not be needed.

Two remaining issues merit additional consideration: (1) if M-clade IHNV is not in the upper Columbia, why not stop all transportation of fish to that area until all labs are trained and a response plan is developed; and (2) if IHN is transferable through seawater and in any environment with high fish densities, this could certainly be an issue for barged salmon or in holding areas of the river system. This virus likely merits high priority attention until it is better understood.

Mainstem Habitat

ProjectID: 199900301

Evaluate Spawning of Fall Chinook and Chum Salmon Just Below the Four Lowermost Mainstem Dams

Sponsor: PSMFC, ODFW, USFWS, PNNL

FY03 Request: \$1,012,405

5YR Estimate: \$5,594,177

CBFWA Adjusted FY03: \$994,000

3YR: \$3,134,000

Short Description: Monitor, protect, and enhance the spawning populations of fall chinook and chum below Bonneville Dam. Search for evidence of fall chinook spawning below The Dalles, John Day, and McNary dams.

ISRP Final Comments:

Fundable. Agree with CBFWA's Urgent ranking. This is an ongoing proposal with some new tasks. The thorough and excellent response adequately addressed the ISRP questions. It appears that differences in timing of appearance of upstream chinook will make it possible to discriminate between them and the local stock. The proposed method, to employ a mark recapture estimation procedure, was described in adequate detail. The investigators gave more thought to the problem of meeting the necessary assumptions in employing such methods, i.e. that emigration and immigration are negligible under the circumstances to be expected with chum salmon juveniles. The background statement was enlarged and shows an understanding of the broader regional needs for flow and water management in the mainstem Columbia River. They identified the key questions that need to be answered and the tradeoffs that must be addressed as more and more salmon are observed to be adapting to the FCRPS. They also addressed the ISRP comments concerning exploration of the feasibility of opening up additional spawning area at the mouths of tributaries in the lower river. The regression analysis was clarified.

If funded, this project should be coordinated with other monitoring projects to ensure compatibility of objectives, common methods, and protocols. This coordination could be accomplished under the favorably reviewed CBFWA proposal #35033.

ProjectID: 35007

Evaluate Restoration Potential of Snake River Fall Chinook Salmon Spawning Habitat

Sponsor: PNNL

FY03 Request: \$315,000

5YR Estimate: \$1,145,000

Short Description: The research to be conducted under this proposal will evaluate the restoration potential of mainstem habitats for fall chinook salmon, especially spawning habitat in the lower Snake River.

Final ISRP Comments:

Fundable. Disagree with CBFWA, the priority of this project should be higher than a recommended action. This is a proposal to identify operational alternatives for the hydrosystem that would allow enhanced spawning of endangered Snake River fall chinook salmon in tailwater and reservoir-headwater zones. This goal would be accomplished by more thoroughly characterizing the physical attributes of such zones now used successfully for spawning and contrasting these same characteristics in other such zones that are suspected of having spawning potential. Operational changes for making the potential spawning areas more suitable (by inducing more appropriate riverine processes in the zones) would be recommended. The proposal provides for monitoring and evaluation of affected spawning habitats should any operational changes be implemented. Existing spawning areas to be used to clarify habitat criteria for

spawning include the Wanapum Dam tailrace and the Hanford Reach above the influence of McNary pool; the potentially enhanced spawning areas are the lower Hanford Reach at the McNary reservoir interface, the Ice Harbor Dam tailrace, and the Lower Granite Dam tailrace.

The proposal was well written and meets the ISRP review criteria. The background is concise and germane to the proposal, and demonstrates sound science principles. The rationale is well stated and significance to regional programs is described by explicit reference to the BiOp's RPA, the Council's FWP, the Mainstem/Systemwide solicitation and program summary, and relevant ISG and ISRP publications. The progression of the previous PNNL studies of spawning habitats in both the Snake and Columbia rivers to the point of developing this proposal is well presented. Previous ISRP concerns that the project would not identify management applications for restoring habitat have been alleviated by objectives specifically oriented to identifying potential operational changes. The work has general application but the focus would be on restoring spawning for fall chinook salmon in the Snake River. The proposal seems likely to produce useable results. There is a potential for increased production of fall chinook that could be substantial. The fact that the COE is a party to the proposal is encouraging. There is an excellent reference list and resumes for a well-qualified staff. Facilities and equipment are available based on past work by the investigators.

If funded, this project should be coordinated with other monitoring projects to ensure compatibility of objectives, common methods, and protocols. This coordination could be accomplished under the favorably reviewed CBFWA proposal #35033.

Additional Suggestions:

The ISRP had several suggestions that did not require a response but which might be of assistance. Questions arose about coordination with other PNNL proposals for related work, such as the hyporheic flow project and other proposals for habitat suitability studies (such as for below Chief Joseph Dam). Although there are differences in location and in the primary emphasis of each of the proposals/projects, the proponents should be aware of the need for coordination. The reviewers wondered if there are habitat improvement alternatives other than flow rate and water elevation that might be considered. Can the recent knowledge about complex physical characteristics beyond the usual depth, velocity, substrate, slope, etc. (such as hyporheic flow and embeddedness) be integrated into effective physical habitat modifications? Can the prior attempts to build artificial spawning channels be used as a guide (or alternatively, can proponents of spawning channels learn from this study)?

ProjectID: 35030

Evaluate potential to enhance spawning of summer/fall chinook salmon in the tailrace of Chief Joseph Dam, Columbia River

Sponsor: PNNL and CCT

FY03 Request: \$134,220

5YR Estimate: \$539,984

CBFWA Adjusted FY03: \$25,000

3YR: \$280,000

Short Description: Evaluate the potential to increase mainstem spawning habitat for summer/fall chinook salmon in the Upper Columbia

Final ISRP Comments:

Fundable as revised for redd counts only. We agree with CBFWA that the project is fundable, but the ISRP questioned CBFWA's urgent ranking of this project especially given that proposal #35007 received a lower ranking although it targeted an endangered stock. The response to ISRP comments marginally addressed the concerns. These concerns had to do with limitations to the

potential enhancement of spawning that are created by existing requirements on the hydropower system for flood control, hydropower production (especially with respect to the mid-Columbia Coordination Agreement), and the existing Vernita Bar Agreement to protect fall chinook in the Hanford Reach, all of which may produce benefits or disadvantages that are currently experienced by salmon in the Chief Joseph tailrace. While the proponents discussed some of the existing limitations on flow manipulations, they dismissed the implications of these rather lightly, as though that is not their problem. While we could agree that status quo ought not to be a restriction on what is undertaken in a scientific investigation, nevertheless, one needs to be aware of the status to understand how it will affect one's observations, (in this case observations on potential habitat) and one's ability to include deliberate manipulations in one's study plan. If any potential habitat lies outside of what is likely to be under water in foreseeable flow conditions then identification of these will not be helpful or relevant. Also, the proponents did not answer the question why this project will require 3 years rather than 1.

If funded, this project should be coordinated with other monitoring projects to ensure compatibility of objectives, common methods, and protocols. This coordination could be accomplished under the favorably reviewed CBFWA proposal #35033.

ProjectID: 35036

Identify the mechanisms of stranding of juvenile fall chinook salmon in the Hanford Reach

Sponsor: USGS-CRRL; USFWS

FY03 Request: \$278,132

5YR Estimate: \$786,000

CBFWA Adjusted FY03: \$250,332

3YR: \$683,200

Short Description: Predict stranding-related mortality using a GIS and statistical approach by incorporating fish behavior and ramping rate information.

ISRP Final Comments:

Fundable and agree with CBFWA that this project is urgent. The proposal focuses on "mechanisms" that might be involved in stranding of juvenile chinook in the Hanford Reach, and puts an emphasis on behavioral mechanisms of the fish that might affect rates of stranding. The response provided more detail on shortcomings of previous studies, how this project fit into those studies, and more specifically identified the expected outcomes of this proposed project that might lead to improved management of flows or other measures.

The ISRP raised questions primarily whether sufficient information already exists on the stranding and entrapment of juvenile fall chinook in the Hanford Reach. The response identified important shortcomings in existing information. This proposal is planned to fill the gaps.

The Council and NMFS's ISAB has a particular interest in this stranding issue (ISAB 99-5) and made a recommendation to the Council that a revision of the Vernita Bar Agreement be adopted to extend protection to emigrating fry. We understand that Grant County P.U.D. led in the development of a revised agreement among all of the (numerous) affected parties in 1999. In addition to studies under the Council's program, funded by BPA, Grant County P.U.D. continues to monitor fall chinook at Vernita Bar during spawning, incubation, fry emergence, and now fry emigration. The response assured the ISRP that the principal investigators are familiar with provisions of the Vernita Bar Agreement and its revision, including the monitoring and evaluation provisions that are ongoing. Specifically, we had questions whether the amended Vernita Bar Agreement might adequately address the problem. The sponsor provided a copy of the amended Vernita Bar Agreement and discussed the problems it fails to address.

The amended Vernita Bar Agreement of February 25th 2002, while it is well intended and represents a step forward to protect recently emerged fall chinook that have not yet moved out of the area, contains loopholes that lead to less than desirable protection. The loss of an estimated 2 million juvenile fall chinook during the spring of 2001 is an illustration of this point.

There are at least two problems that can be seen in the new agreement that are pointed out in the response. The agreement specifies permissible fluctuations in flow under various river flow scenarios, but the frequency, duration, and rapidity of fluctuations are not specified. The provisions do not spring directly from field observations that indicate whether they would prevent mortality of fish or not. In practice the major changes in flow brought about by load following occur at night between 11 PM and 5 AM. By the time field crews arrive on the river in the morning, flows have increased and any dead fish have been washed down the river. The Vernita Bar Agreement should be modified to correct the problems with flow specifications, and the field monitoring should be modified to include nighttime observations.

The response agreed with the ISRP comment that there is a need to exercise caution when deliberately manipulating flows in order to study their effects on stranding, particularly since they are planned for times when fry are expected to be present (Task 1.a, p. 7).

The response adequately addressed questions about the potential for extraction of further important information from existing data. The ISRP suggested that information already available from previous studies might be used to identify certain areas responsible for major strandings. The sponsors agreed it might be useful to open these up with a dozer or other mechanical means, deepening a downstream outlet end of the pool to facilitate emigration of fry, but the current status of the Reach as a National Monument could make it infeasible.

ProjectID: 35057

Habitat Condition and Restoration Potential of Columbia River Flood Plains: A Critical, Missing Element of Fisheries Recovery Science and Policy

Sponsor: UM

FY03 Request: \$1,200,000 **5YR Estimate:** \$4,692,124

Short Description: Restoration of alluvial floodplains is critical if fisheries are expected to flourish. We will identify all floodplains in the Columbia River Basin and assess ecological integrity relative to human disturbance.

ISRP Final Comments:

Fundable (qualified). Agree with CBFWA's Recommended Action ranking. This is a good long-term research project that should result in significant management actions over the next two or three decades to improve fish and wildlife habitat. The project is designed to catalog alluvial flood plains in the Columbia River Basin, assess ecological intactness of these flood plains, identify major changes in ecosystem structure of flood plains, and identify actions needed to restore, protect and sustain damaged flood plains to normative conditions. The scientific framework is consistent with river recovery theory so the results should help provide a basis for coordination of restoration activities.

The value of this approach is the demonstration of this technique in the prioritization of floodplain restoration projects. The prioritization should be based on biophysical properties. The social and economic segment of the project as proposed in the sponsor's response to ISRP preliminary review comments is inadequate and should not be funded. The review panel proposed in the sponsor's response to ISRP preliminary review comments is inadequate as a monitoring

and evaluation program. Funding should be contingent on the development of a monitoring and evaluation plan. The budget should be reviewed carefully.

ProjectID: 35062

Impacts of Flow Regulation on Riparian Cottonwood Ecosystems in the Columbia River Basin

Sponsor: University of Idaho

FY03 Request: \$382,024

5YR Estimate: \$1,043,918

Short Description: Research riparian cottonwoods and geomorphic responses to regulated flows in the Yakima Basin, compare responses to an unregulated reach of the Flathead River with the objective of enhancing flows to restore riparian habitats in the Columbia Basin.

ISRP Final Comments:

Fundable (qualified). Disagree with CBFWA's High Priority ranking; this is of lower priority. The project represents good science conducted by well-qualified investigators. The scientific background is extensive and well written. The project is related to other projects and regional programs. Objectives, tasks and methods are well written and complete. This proposal builds on work begun under one-year innovative funding to examine the impact of regulation flows on riparian cottonwoods in the Yakima and Kootenai River Basins. The use of remote-sensing tools and field sampling methods for further studies of riparian cottonwoods in other alluvial reaches of the Columbia River Basin was the "proof of concept" aspect of the innovative project. This project should provide recommendations for normative changes in flow regimes in the Yakima that maximize recruitment of cottonwoods, and the sponsors make a convincing case based on published literature that normative changes in flow regime will improve fish habitat. However, the project does not provide direct measurement of habitat and fish community changes associated with flow regime change. This unmeasured applicability to stream habitat and aquatic communities is a distinct shortcoming of the proposal.

The response repeats many of the assertions from the original proposal. Some members of the sponsors' proposed "review team" appear to have close connections to project personnel, raising a question of objectivity.

Water Quality: Gas Bubble, Temperature, and Contaminants

ProjectID: 199602100

Gas bubble disease research and monitoring of juvenile salmonids

Sponsor: USGS, CRRL

FY03 Request: \$16,885

5YR Estimate: \$94,079

Short Description: Provide support for the Smolt Monitoring Program (SMP) monitoring juvenile salmonids for signs of gas bubble disease. Activities include (1) care and maintenance of equipment, (2) training, and (3) QA/QC

ISRP Final Comments:

Fundable agree with CBFWA's Core Program Ranking, a response was provided on administration and sampling. This project provides necessary operation and maintenance services and training for the Fish Passage Center's gas bubble disease monitoring. Could this proposal be combined with another larger program for efficiency and programmatic review, such as the Fish

Passage Center? The proponent may be correct in their response that such an arrangement would actually increase cost of administration, but this administrative issue deserves further consideration from Council or BPA. If funded, this project should be coordinated with other monitoring projects to ensure compatibility of objectives, common methods, and protocols. This coordination could be accomplished under the favorably reviewed CBFWA proposal #35033.

ProjectID: 35013

Species- and site-specific impacts of gas supersaturation on aquatic animals

Sponsor: CRRL

FY03 Request: \$494,249

5YR Estimate: \$2,731,036

CBFWA Adjusted FY03: \$263,783

3YR: \$694,902

Short Description: Address critical uncertainties about effects of gas supersaturation on aquatic animals.

ISRP Final Comments:

Fundable in Part. Agree in part with CBFWA's High Priority ranking. Parts of the proposed research are fundable. However, serious doubt exists as to whether adequate data will be gathered to test some of the hypotheses due to sample design or location. The ISRP agrees with CBFWA's "High Priority", i.e. that this study is not urgent although parts of it can be acceptably accomplished per the experimental designs provided.

The first part of this proposal intends to provide information on some key uncertainties about effects of gas supersaturation on three species of resident fish for which there is not much data: sturgeon, lamprey, and bull trout. If the states' water quality agencies are to continue to approve an upper limit of 120% total dissolved gas saturation (TDG) in river water (in contrast to the national water quality criterion of 110%), then they need a higher level of proof that 120% gas will not harm resident fishes (all life stages). The proposed study may not adequately answer the question. The ISRP has the following concerns over sample sizes and experimental designs.

All three species tend to be bottom oriented and deep water species, whereas most TDG effects are induced in the upper two meters of the water surface due to hydrostatic compensation. Thus, the frequency and geographic preponderance of gas bubble trauma (GBT) may be rare and difficult to find in these species. This problem calls for (1) especially well thought out experimental design and sampling of large numbers of fish, and (2) excellent control of TDG at the proposed sites for the exposure experiments. The study proposal does not clearly meet these criteria. In general, high TDG conditions are not excessive and chronic at either The Dalles or Bonneville, except in rare flood flow discharges. Thus, looking at only these two locations may not be the best "laboratory" because the desired test conditions near 120% may not occur. For valid tests of the effects of circa 120% TDG, a site where these conditions occur would be scientifically preferable. The ISRP also shares the proponents concern regarding the limited numbers of bull trout at Hood River for adequate sample sizes.

Regarding sturgeon components of the research, the ISRP agrees with the proponents' response that juvenile sturgeon in the Columbia may temporally circulate near the surface and hence be exposed to high TDG. Sturgeon larvae enter the surface waters when they are in their swim-up mode for dispersal. However, the lower Columbia population of sturgeon is healthy in terms of spawning, recruitment, and age structure. Thus, unlike other white sturgeon populations upstream where there are significant age class gaps in the populations, it is unclear that factors such as TDG are adversely affecting larvae below Bonneville. Documentation of larvae without GBT

signs at the surface in circa 120% TDG water below Bonneville Dam would be valuable information.

For the bull trout and lamprey components of the study, the researchers were open to the ISRP's suggestion, described further below, to improve sampling and experimental field conditions by selecting study sites that are more likely to have high TDG levels. If the study's objective is to determine if 120% is benign, then the experiment must include that value. Apparently, BPA expressed concern over conducting the study outside the FCRPS. Nonetheless, good experiments require good design and better test and control conditions than may be found in the lower Columbia River. If acceptable test conditions and sample sizes are more likely to be found at locations other than BON and TDA dams, then it may be fiscally and scientifically more prudent to do experiments where relevant results are more likely to be obtained, with the results generalized to the sites of actual concern. The TDG curves submitted in the response suggest it will be difficult to maintain control of TDG at or near 120% in normal or low flow conditions for periods of time needed to assure a good "treatment" condition is administered in the river at BON and TDA. Flows in 1997 were atypically high and cannot be expected again with sufficient likelihood to plan an *in situ* experiment. Although artificially high spill could be implemented to create high TDG if low flow conditions prevail in 2003, the FCRPS operators may be reluctant to implement such large spills to achieve 120%. If experiments are performed in appropriate TDG levels at locations outside the FCRPS and prove "positive" (show GBT signs in fish), then the studies could be followed up at FCRPS installations in subsequent years, especially when it is likely that high flow conditions might prevail. A location where bull trout may be regularly exposed to high levels of TDG is in Lake Pend Oreille and the lower Clark Fork River. This area seems to have much greater potential for collecting adequate samples of bull trout and for exposing bull trout to the high TDG levels of concern. The management and operations of these dams on the Clark Fork are under study and it is much more likely that study of impacts, treatments and monitoring will increase our knowledge of bull trout, dams and TDG there than at the locations proposed in this proposal.

Given the general concern over adequacy of statistical design to determine whether fish are responding to habitat changes, a recent report to Washington State Independent Science Panel, May 7, 2002 may be of use. Dr. Peter Bayley, Oregon State University, suggested that much of the existing design of field observational research is inadequate to elucidate cause and effect habitat-population response mechanisms.

The exploratory lamprey studies were better justified given the paucity of data and the differences between lamprey and teleost fishes. Again, location for the experimental data collection raise doubts about adequacy of control and test conditions and the potential to collect adequate samples to test hypotheses. The lab component of this study seems to be better designed.

The study of TDG exposure to migrating adult salmon and subsequent effects on spawning is more likely to yield useful results with the design presented. The hypothesis that TDG exposure may not kill, but could impair reproduction of adults is reasonable. The technology exists in PIT and archive tags to test this hypothesis. Again, the ability to collect data with an adequate sample size will be a question. Depth of exposure will also be an issue, for some data suggest adult migrants use the deeper sections of the thalweg of LGR reservoir to migrate. Thus, successful spawning of "exposed" adults may be the result of depth compensation mechanisms. The lab duplication may have less value than the field experiment, because the fish are not exposed to the other rigors of river migration during and after a TDG exposure. However, lab studies carried out together with field experiments may shed some light on whether reproduction is physiologically

hindered by TDG exposure. This experiment should be considered a screening test for more rigorous sampling if any indications of impairment is observed.

In summary, although the proposed work is important, several elements of this study are not adequately designed to assure statistically useful results while others show more promise and justification for at least exploratory investigation.

The less justified elements include:

- Studies of bull trout at Hood River and near The Dalles Dam due to low population levels and concerns about adequate sample size and the availability of needed exposure conditions. TDG studies of bull trout in Lake Pend Oreille and lower Clarkfork River may yield larger populations for study and more desired exposure conditions, which could be generalize to other locations.
- Studies of lamprey at Bonneville Dam due to the inability to regulate TDG exposures for experimental purposes. Studies of lamprey where TDG has higher/longer frequency, possibly at Willamette Falls, or a location where adequate fish samples can be obtained and where exposure conditions can be better controlled would provide more assurance of a successful study.

More justified elements would include:

- Lab studies of lamprey exposure to TDG
- PIT and archive tag data analysis of spawning frequency of adults exposed to TDG during migration
- Artificial propagation studies of salmon after TDG exposure.

If funded, this project should be coordinated with other monitoring projects to ensure compatibility of objectives, common methods, and protocols. This coordination could be accomplished under the favorably reviewed CBFWA proposal #35033.

ProjectID: 35038

Develop Computational Fluid Dynamics Model to Predict Total Dissolved Gas Below Spillways

Sponsor: ENSR

FY03 Request: \$604,998 **5YR Estimate:** \$604,998

Short Description: Develop a computational fluid dynamics model to predict total dissolved gas levels below spillways that can be used to manage operation of a particular project and/or to predict benefit of proposed structural changes prior to their implementation.

ISRP Final Comments:

Fundable. Disagree with CBFWA's Do Not Fund recommendation. The response addressed the ISRP concerns. This is a project to develop a computational fluid dynamics (CFD) computer model of processes that cause dissolution of air into water during spill. These processes cause high total dissolved gas levels in dam tailwaters and supersaturated conditions with respect to atmospheric pressure, which can injure and kill fish. Such a model would predict gas levels in a tailwater based on the physical geometry of the spillway and water flows. The proponents justify the model development by the anticipated ability to compare predicted total dissolved gas levels under different simulated physical configurations at a spillway (e.g., testing whether different designs of flip lips will work as expected) or under different simulated spill flow regimes. The predictions would be used to design or modify spillways so that they cause less dissolved gas. A wide variety of configurations and flows could be tested via these simulations (far more than

could be empirically tested at an actual dam). Currently, such predictive power is believed not to exist, and only empirical observations under a limited number of different conditions are available. As clarified in the presentation, the CFD model is a near-field model and does not compete with far-field models that are designed to calculate gas flux (mostly loss) in a river or reservoir downstream of a dam.

The proposal is technically excellent and meets the ISRP review criteria. It is based on sound scientific principles, it is consistent with the Council's Fish and Wildlife Program, it has clearly defined objectives (with appropriate tasks and methods), and it provides for monitoring and evaluation of its results through model verification. The proposal is claimed to meet a regional need in adapting and applying well-known methods and software to help the region better understand the benefits and consequences of spill events and to forecast the effects of changes in spillway configurations designed to reduce gas supersaturation (but see below).

The ISRP recognizes that Computational Fluid Dynamics (CFD) models are being used for many hydraulic applications, and it seems logical to try this technique here. The adaptation combines deterministic equations with limited use of statistical models to understand the magnitude and distribution of dissolved gases below spillways. The logic for the model seems good. The proponents are well qualified to do the work, and the collaboration (including a large cost share) between ENSR and the Corps is an excellent mix of interests, capabilities, and eventual users. The problem of modeling air entrainment in the plunge pool may be a particularly difficult one to solve. The basic concept that mass exchange of gas between bubbles and water is an equilibrium process where the history of bubbles entrained below the spillway in time controls the TDG below the spillway has a firm basis in physical science. The success of the modeling effort will be tested against the relatively abundant data at Bonneville Dam spillway. The proponents agreed to further consider calibration and validation of the model at other dams so that the model is not constrained by any peculiarities of Bonneville.

The ISRP concerns over the need for this model were adequately alleviated by the response. The proposal states on page 1 that "To date, prediction of spill-induced TDG is based on empirical relationships developed from project-specific field data. These predictive relationships are only applicable for the range of project operations for which the field data were collected and are only valid for the existing spillway geometry." The proposal goes on to assert that there are no tools available for accurately predicting expected improvements prior to implementing changes in the field. However, existing models that use empirical data over a range of spillway operating ranges with prescient forebay conditions have already been developed and they use real data, real conditions and are calibrated sufficiently to predict the TDG behavior of spill scenarios expected over most operations. Field data have been collected in a designed program for more than 20 years, and cover a wide range of project operations.

The ISRP reviewers were skeptical that 3D computational fluid dynamics modeling could add much to the field data and analyses that have already been produced. The response was helpful in explaining how the model might be useful as an adjunct to existing models, and in fact if properly developed and subsequently employed, might result in cost savings by reducing or even eliminating the need for continuing extensive monitoring of TDG. The "Benefits of the Proposed CFD Model" section of the response was particularly to the point. One could imagine a situation where periodic random sampling of TDG would suffice - once the model was verified.

The presentation, discussion, and response clarified the distinction between the CFD spillway model and the existing water quality models that predict far-field TDG effects. These water quality models were completed by Battelle over the past 5 years (see Richmond et al. 1999 and

others). The proponents showed in their response how their near-field model will link with these existing far-field models.

In summary, the proponents do a good job of showing that this “first principles” CFD model can provide more information for design of low gas spillways than can the accumulation of monitoring data from user-specific and limited cases. They also are persuasive that not all structural modifications have been made on spillways that cause DGS and that the model will have uses. They clearly show that the Bonneville Dam case to be modeled was selected because of the wide array of empirical data for model validation/calibration, and not because of the greatest need to use it at Bonneville. The Bonneville case will be used to develop and test the model, and then it can be applied elsewhere where the needs are likely greater. The proponents adequately show how their model would be interfaced with the far-field models used for the basinwide modeling by providing tables of input values rather than direct linking.

ProjectID: 35024

Evaluating the sublethal impacts of current use pesticides on the environmental health of salmonids in the Columbia River Basin.

Sponsor: NMFS/NWFSC

FY03 Request: \$364,105

5YR Estimate: \$1,053,975

CBFWA Adjusted FY03: \$304,905

3YR: \$875,775

Short Description: Screen for the effects of a broad range of current use pesticides on a model species (zebrafish). Evaluate the effects of specific pesticides on the physiology and fitness of at-risk chinook. Incorporate data into a model of chinook population viability.

ISRP Final Comments:

Fundable, we agree with CBFWA that this is fundable; however, it is not apparent that this project should be among the highest priority for BPA funding. This exceptionally high quality proposal contains well-designed scientific experiments on toxicological effects of pesticides on zebrafish physiology. The premise for the research is that pesticides exist in the environment at concentrations that are physiologically affecting sub-populations of salmon and have a measurable and detectable impact on the return rates of salmon. The investigators are highly knowledgeable of the physiological laboratory techniques and literature and well qualified for the type of work proposed. The proposed research is scientifically sound; it is consistent, albeit not directly or likely immediately useful to the FWP. It has clearly defined objectives and related tasks; and it has a monitoring component. It is well connected to other pesticide studies in the basin.

The response was thorough and provided convincing evidence that embryonic development is a highly canalized physiological phenomenon in all vertebrates and thus the zebrafish model is relevant; i.e. zebrafish are an accepted standard for such screening tests, and as such are logical to use. The proponents make a persuasive case for the rapidity of the zebrafish assay compared to salmon. They also clarified that copper is a primary ingredient of many pesticides and therefore relevant.

The ISRP’s concern with the proposal is with the next step, that is, making the link to salmonids and other Columbia River basin fish, but this is not what they propose. The authors hypothesize olfactory impairment from pesticides may be a source of straying, but do straying, physiological, or behavioral anomalies exist differentially in the basin and could those be related to pesticide concentration? No data exist according to the authors; thus, the hypothesis that straying is affected by pesticide would need to be corroborated. Whether pesticides exist in quantities

sufficient to affect salmon and especially salmon embryos in the wild remains hypothetical. The authors present evidence that some of the pesticides are detectable in agricultural basins at ppb levels of concentrations. Are these sufficient levels to raise concerns to warrant in vitro tests on zebrafish? The authors indicate that if, after three years of research on zebrafish, there is significant justification they will then proceed to transfer hypotheses directly to salmon. The ISRP would be more enthusiastic about the priorities of this research if there were field evidence for the hypothesized issue, i.e. observed data that the problem exists to which the proposed research might explain or mitigate the problem in salmonid populations

The research seems extremely interesting to basic science, but potentially a long shot, based on the likelihood that results will be directly applicable to the management of the FCRPS and salmon recovery. Near-term benefits to salmon are unlikely because of the long-term nature of the studies including the need for connections in the field.

Some fascinating observations were cited by the authors about physiological and behavioral responses by salmon to predator alarm pheromones. Although not the intended subject of this research, the ISRP would be interested in research that can be done to develop more wild-like traits in hatchery-reared smolts. Does this area of physiological research hold potential large benefits to salmon?

We agree with CBFWA's suggestion that this research should be funded through other sources like EPA.

ProjectID: 35058

Evaluation of food availability and juvenile salmonid growth rates under differing thermal and sediment regimes.

Sponsor: CRITFC

FY03 Request: \$218,885 **5YR Estimate:** \$672,409

Short Description: Evaluate food availability as an index to potential salmonid growth and survival on stream continua representing varied combined land management effects, such as water temperature regime, substrate composition, and riparian condition.

ISRP Final Comments:

Do Not Fund; agree with CBFWA. This proposed study would contrast food availability and growth rates of bull trout, steelhead and spring chinook salmon in different qualities of stream habitat in the John Day watershed, with emphasis on water temperature. Stream reaches encompassing orders 2-4 are viewed as river continua (gradients) in which temperature is expected to range from cold in the headwaters to warm in lower reaches. Continua that have undergone landscape disturbance (e.g., agriculture, forestry) are expected to be warmer, have less total optimal thermal habitat over the fish growing season, and have additional changes in physical structure such as substrate composition, bank stability, and riparian vegetation. The study would quantify physical stream features, macroinvertebrate abundance (largely as drift of aquatic and terrestrial forms), and fish growth. This study would be tied closely with ones conducted by the ODEQ and ODFW, which will conduct the initial site screening and allow the proposed study to select the most suitable study reaches. The expected result is that certain land management actions will be shown to result in reduced productivity of food and lowered growth of fish (due, in part, to less optimal temperature habitat).

Although the topic of salmonid production is important and temperature effects issues are timely, the proposal lacks clarity. The background section is long and not well organized. It lacks focus on the salient features leading up to a hypothesis for the proposed study. Although temperature is

a key element, few thermal references are given for the many generalizations. Some topics are introduced that do not seem germane to the proposal. Information on ESA listings seems to have been tacked on at the end of the section with little thought. The Council's Fish and Wildlife Program is not mentioned although the rationale lists RPAs from the Biological Opinion, but does not say what they are or discuss the Action Agencies' need to address them. The rationale uses stated needs for food and feeding studies in the mainstem, estuary and ocean as justification for the work in the John Day watershed, without clarifying that this seems to be a general need over salmonid life histories. In the section on relationship to other projects, the proposal discusses the linkage with the ODEQ and ODFW studies, but does not make clear just which organization will do what (there does not appear to be any cost sharing).

It is not apparent that the study would have the ability to separate effects of abundance, growth, and the influence of competition. The proposed study focuses on growth as the response variable to water temperature and food availability. It will depend upon other studies (by ODEQ and ODFW) for measurement of fish abundance (page 10). Those studies are said to provide information on presence/absence of juvenile salmonids and indices of abundance. Experience suggests that adjustments in abundance will be the primary response by populations of juvenile salmonids. Dominance hierarchies are established, leading to emigration of less competitive individuals or species. In this way, growth rates will not necessarily reflect the influence of environmental factors on the population. It is proposed (page 12, item 3) to temporarily confine salmonids in stream reaches for the purpose of measuring their growth rates. This is an unrealistic procedure that is unlikely to satisfy the requirements of an appropriate sample of conditions in a natural stream. For example, the method of confinement may, in itself, modify the production of invertebrate stream drift. A further problem is that other than specifying that the study is proposed to be conducted in the John Day Basin, no sites have been chosen for the study. It is at this stage uncertain that appropriate sites, that will represent "...key stream continua representing substantially different thermal regimes (and land management effects) ..." can be found. (page 12).

It is not clear that the proposal meets the ISRP review criteria. There is sound science described in the background, but its application to the study is not clear. The study seems to lack rigor of purpose (perhaps more a matter of quality of explanation than of intent). There appears to be benefit to fish and wildlife in larger fish at outmigration when growth is high, but the benefit of the project in guiding land management is not broached. The objectives and expected outcome are not clearly stated. The proposal's objectives are actually tasks, and the listed tasks are detailed elaboration on them. The real objectives remain to be clearly stated. Reference is made to meeting the objectives stated in subbasin documents, but these are not given or addressed. The methods are very detailed and instructive (perhaps leading to quibbles over details). The figure was not labeled so that reviewers could tell what the notations mean. The whole project is considered monitoring and evaluation, with no further discussion.

In summary, the proposal is poorly presented and not well organized. Hypotheses are not clear and the implicit ones are rather simplistic given our current understanding of temperature impacts, feeding ecology, competition, etc. Study sites (and therefore the land use practices to be compared) have not been selected. The proposal is not fundable in its present form and the deficiencies were not clarified in the presentation.

Juvenile and Adult Fish Passage

ProjectID: 199403300

The Fish Passage Center

Sponsor: PSMFC

FY03 Request: \$1,316,323

5YR Estimate: \$7,257,504

CBFWA Adjusted FY03: \$1,302,904

3YR: \$4,109,391

Short Description: Provide the fishery agencies and tribes with technical expertise regarding hydrosystem operations, analysis of smolt monitoring data for daily, weekly and monthly fish passage management decisions, and regional fish passage data base management.

ISRP Final Comments:

Fundable. Agree with CBFWA's Core Program ranking. The ISRP appreciates the careful and complete responses that provided adequate details on methods, monitoring, and evaluation. The explanation of relationships to other projects was useful. For example, the relationship to the proposed CBFWA project #35033 was particularly helpful. As we understand the proposals, the FPC project, and others, e.g. the smolt monitoring program (SMP), are all CBFWA sponsored and jointly developed proposals in terms of joint sponsorship by the state, federal and tribal fishery managers. If #35033 is funded then the functional melding of #35033 with the FPC and the SMP is likely assured.

ProjectID: 198712700

Smolt Monitoring by Federal and Non-Federal Agencies

Sponsor: PSMFC

FY03 Request: \$2,481,100

5YR Estimate: \$13,493,183

CBFWA Adjusted FY03: \$2,435,941

3YR: \$7,604,034

Short Description: Daily passage data through the mainstem, Snake, Columbia and mid-Columbia Rivers to facilitate fish passage management decisions, including Biological Opinion implementation, is collected daily. Sampling and marking occur at 8 sites of the larger region.

ISRP Final Comments:

Fundable. Agree with CBFWA's recommendation of Core Program. The ISRP appreciates the careful and complete responses given to our comments and to the RME Group comments. While there may be some differences of opinion concerning particular methods, the response is adequate. Specifically, the response provided adequate details on methods, monitoring and evaluation activities, and connections with other projects such as 35033. If #35033 is funded then the functional melding of #35033 with the FPC and the SMP is likely assured.

The responses to the RME Group comments illustrate the need for a coordinated, cooperative systemwide monitoring and evaluation program. The RME Group expressed the need for certain abundance estimates of juveniles migrating from the Snake and Salmon Rivers. The Smolt Monitoring Program sponsors responded, "Historically, SMP estimated trap efficiencies at the Snake and Salmon River Traps. The Nez Perce tribe as part of their SMP monitoring at the Imnaha trap have also estimated trap efficiency at the Imnaha Trap. ... Given that the NMFS RME group has identified abundance as a critical component of their performance measures in the BiOp, the SMP program could add those objectives and modify trap operations to begin to estimate trap efficiencies and population abundance passing the trap. The SMP proposal for 2003 can be modified to include these tasks if the region desires." This is an example of the need for better communication of the Action Agency/NMFS RME and CBFWA. This lack of

communication is particularly puzzling to the ISRP, because some of the Action Agencies/NMFS members are also members of the CBFWA.

ProjectID: 199602000

Comparative Survival Rate Study (CSS) of Hatchery Pit Tagged Chinook & Comparative Survival Study Oversight Committee

Sponsor: PSMFC & CBFWF

FY03 Request: \$1,742,776

5YR Estimate: \$9,497,683

CBFWA Adjusted FY03: \$1,736,542

3YR: \$5,420,981

Short Description: Adult and juvenile PIT tag recovery data are analyzed to compare survival estimates for transported fish of known origin, downriver stocks, wild and hatchery transported fish and fish handled and not handled at dams.

ISRP Final Comments:

Fundable (Qualified), agree with CBFWA's Core Program ranking, but some reallocation of effort for mathematical and statistical research, as indicated in the following, should be worked out by the Council during the project selection process and implemented by BPA in the contracting process. The response provided adequate details on monitoring activities, and connections with other projects such as 35033. If 35033 is funded then the functional melding of 35033 with the CSS is likely assured.

A subcommittee of the ISRP met with representatives of the Comparative Survival Study (CSS) in Seattle on September 24, 2002. We appreciate the sponsor's willingness to meet and discuss the technical issues of the design and analysis of the study. The long-term solutions to the mathematical and statistical problems in estimation of smolt-to-adult return rates (Bonneville to Bonneville and Bonneville to Low Granite SARs) appear to be: 1) detection of sufficient numbers of PIT tagged juveniles passing Bonneville No. 2 Dam at the planned corner collector, estimates of mortality of fish passing via that route, and/or 2) sufficiently large sample sizes of PIT tagged fish downstream of Bonneville. The ISRP recommends that these sampling efforts for PIT tagged juveniles be given high priority by the Council and the Corps of Engineers. In particular, task 2 of proposal 198331900 from NMFS for development of PIT tag detection in the corner collector at Bonneville No. 2 Dam should be given high priority.

Various scientists in the region, in particular scientists from the CSS project and NMFS, have considered the problems in estimation of the LGD to LGD SARs from currently available data and have apparently arrived at what they consider to be the "best" formulas. Unfortunately, the formulas are complicated, convoluted, and in general, very unsatisfactory from a statistical point of view. There is high probability that the complicated, convoluted methods will continue to spawn arguments and counter arguments over trivial issues that will occupy the resources of the region, because the stakes are high (e.g., high costs of spill, high costs of transportation, unknown long term effects of the non-normative transportation, high costs of augmented flow, etc).

We do not provide unqualified endorsement of the particular estimation formulas that are proposed, and we recommend that continuing statistical methods research be directed at investigating the performance of various proposed estimators and possible alternatives, including but not limited to the proposed methods and planned bootstrapping. Such research on mathematical and statistical methods could be pursued by the sponsors of this project, and by others. As an aid to clarity in comparison among possible alternative analyses, we recommend that the FPC make available a single reference data set which includes all the necessary interpretation of route of passage of PIT tagged fish and culls any suspect or ambiguous data that

might be subject to further interpretation. The budget for the recommended mathematical and statistical analyses is relatively minor compared to the total cost of the project so investigation of our unresolved questions about statistical methods should not require substantial reallocation of the budget in this project.

ProjectID: 199008000

Columbia Basin Pit Tag Information System

Sponsor: PSMFC

FY03 Request: \$2,532,711

5YR Estimate: \$13,717,975

CBFWA Adjusted FY03: \$2,431,442

3YR: \$7,441,185

Short Description: Provides basic infrastructure for all PIT tag related projects in Columbia River Basin. Operates and maintains long-term data repository for PIT tag information. Operates and maintains permanent PIT tag interrogation sites. Supports other PIT research.

ISRP Final Comments:

Fundable (qualified). Agree with CBFWA that this is a Corp Program. However, the project should not be funded until the sponsor and the Columbia Basin PIT Tag Steering Committee develop and implement required procedures for storage and retrieval of full metadata on PIT tagged fish before records are stored in PTAGIS. Given the urgent need for the project to include metadata, the budget should not be reduced and may need to be increased.

The ISRP acknowledges that some metadata are available in the record stored in PTAGIS for a given PIT tagged fish. However, the metadata are insufficient due to the fact that much of it is optional and the fields are too small to include full information concerning how a given fish has been treated prior to release (e.g., the treatment history of fish reared under a NATURES program or genetic background in a captive breeding program). There should be a requirement to:

Tie the record (tagging and detections) for each PIT tagged fish to the verified migration path of the fish and to a published or electronic permanent document that describes the capture or rearing history and treatment of the fish.

At the present time, it is our understanding that the initials of the principal investigator responsible for tagging a fish are stored in the record and one must contact that person to obtain required metadata on a tagged fish. This procedure may have been adequate given the short time that PIT tags have been in use, but in the not too distant future the principal investigators are going to retire or die and the required metadata will be lost.

The ISRP recognizes that this lack of adequate metadata is not the full responsibility of the sponsor and that ownership of data is a concern. However, the verified migration path of a PIT tagged fish and the published documents (or hatchery reports, progress reports, etc.) are absolutely required to ensure maximum long-term scientific value of the information in the database. Perhaps the required documents could be stored in the StreamNet library and then be made available to the public within a limited amount of time. This problem has been pointed out in previous ISRP and ISAB reviews and it appears that little if any progress has been made in resolving the issues.

If funded, this project should be coordinated with other monitoring projects to ensure compatibility of objectives, common methods and protocols. This coordination could be accomplished under the favorably reviewed CBFWA proposal #35033.

ProjectID: 200100300

ISO Adult Pit Interrogation System Installations

Sponsor: PSMFC

FY03 Request: \$1,972,106

5YR Estimate: \$4,529,506

Short Description: Provides for procurement of PIT tag interrogation system electronic components and labor for assembly and installation in adult fish ladders at Ice Harbor, Lower Granite and the Dalles in FY02/03 and at John Day, Lower Monumental and Little Goose in FY03.

ISRP Final Comments:

Fundable. Agree with CBFWA's Core Program ranking. The ISRP preliminary comments asked for more detail on quality control, study design and determination of the sample size and power. The response addressed these issues satisfactorily. If funded, this project should be coordinated with other monitoring projects to ensure compatibility of objectives, common methods and protocols. This coordination could be accomplished under the favorably reviewed CBFWA proposal #35033.

ProjectID: 35031

Tagging Study Technical Committee

Sponsor: BPA

FY03 Request: \$150,000

5YR Estimate: \$850,000

Short Description: This project will establish a forum – the Tagging Study Technical Committee – to assist the region in mapping and tracking PIT-tag studies to help identify gaps and overlaps; to coordinate funding and implementation among the Corps, BPA, and the PUDs.

ISRP Final Comments:

Do not fund. Disagree with CBFWA's Recommended Action ranking. There is a need to integrate the entire smolt monitoring/PIT tagging and other tagging responsibilities into a systemwide monitoring and evaluation program. The RME group agrees with the ISRP comments on this proposal. The ISRP recommendation is that the work should be conducted under an existing project, such as the Fish Passage Center. The RME group stated, "Although the appeal of this type of effort is apparent, it seems that instead of creating another entity to oversee/advise another aspect of activities in the CRB, the essential elements of this proposal could be incorporated into another project already addressing PIT-tags. These might include the PTAGIS or Fish Passage Center. The tasks and responsibilities could be incorporated into ongoing work statements with the same net result." If funded, this project should be coordinated with other monitoring projects to ensure compatibility of objectives, common methods and protocols. This coordination could be accomplished under the favorably reviewed CBFWA proposal #35033.

ProjectID: 198331900

New Marking and Monitoring Techniques for Fish

Sponsor: NMFS

FY03 Request: \$878,000

5YR Estimate: \$2,886,900

CBFWA Adjusted FY03: \$816,500

3YR: \$2,123,400

Short Description: Develop, install, and evaluate PIT-tag interrogation systems and ancillary equipment to expand the capabilities of the Columbia River Basin (CRB) PIT-tag technology to meet fishery resource stakeholders' needs

ISRP Final Comments:

Fundable, agree with CBFWA that this is of Urgent priority. An adequate response was provided prioritizing subprojects and providing budget information by components. The ISRP emphasizes, as does the RME Group, the importance of task 2 to develop and evaluate a high-flow interrogation system for the corner collector at Bonneville Dam. This information would help the region answer longstanding questions concerning SARs for in-river and transported fish. If funded, this project should be coordinated with other monitoring projects to ensure compatibility of objectives, common methods and protocols. This coordination could be accomplished under the favorably reviewed CBFWA proposal #35033.

ProjectID: 199302900

Estimate Survival for the Passage of Juvenile Salmonids Through Dams and Reservoirs of the Lower Snake and Columbia Rivers

Sponsor: NMFS/NWFSC

FY03 Request: \$1,884,200

5YR Estimate: \$9,192,200

Short Description: Provide precise measurements of survival of juvenile salmon as they pass through dams and reservoirs in the Snake and Columbia Rivers and relate to adult returns.

ISRP Final Comments:

Fundable. Agree with CBFWA Core Program ranking. This is an ongoing research project to provide precise estimates annually of survival of juvenile salmonids migrating through reservoirs, dams, and free-flowing reaches of the Snake and Columbia Rivers. Survival information is important for evaluating the success of strategies to recover depressed stocks and to evaluate success in meeting the passage survival performance standards in the NMFS 2000 Biological Opinion. The project plans to continue to PIT tag yearling chinook salmon and steelhead at Lower Granite Dam as needed to estimate their survival through the hydropower system. When possible, the project will also follow fish PIT-tagged in other studies. The project will also continue to PIT tag hatchery subyearling fall chinook salmon for release above Lower Granite Dam to estimate their survival through the Snake River and PIT tag and release river-run subyearling fall chinook salmon (mostly wild Hanford stock) at McNary Dam to estimate their survival through the lower Columbia River. The research will determine where losses occur for subyearling chinook salmon between the free-flowing Snake River and Lower Granite Reservoir using a streambed flat-plate PIT tag detector. Results will be used to explore the relationships among survival, travel time, environmental variables, and dam operations using the expanding database generated by this study. As PIT-tagged adult fish return, the research will continue to explore survival to adult for fish with different passage histories.

This is a very well prepared proposal that meets the ISRP review criteria. The ISRP's comments on the FY 2000 proposal (selectively quoted below) remain germane. The excellent publication

record continues. The project cost has escalated as plans are made to partially absorb the trawl netting conducted below Bonneville Dam in order to obtain lower river survival estimates. The size and complexity of the project warrant periodic special review. The region is again advised to think about the future of this research and monitoring effort, which is a cornerstone of salmon evaluations in the mainstem.

In FY 2000, the ISRP commented:

“This proposal is very well presented, reports progressive development of methods and techniques over time, and demonstrates a timely and strong publication record of research. The proposal is well integrated with other related projects and presents a logical sequence of objectives and methods. The project is a core PIT tag application program that has been expanding its area of study as new detectors are installed and developed. This kind of information is vital if agencies wish to develop priorities for research and/or to develop a relative ranking of mortality sources in the Columbia.

The scope of the project is again so huge that it is extremely difficult to provide any cogent or constructive comments. Given this scope, the annual cost, and projected duration of this request, it seems advisable to conduct periodic programmatic reviews using expert panels. Such panels should provide a broader scientific basis for review and the necessary regional perspective to better evaluate the merits of the on-going research. This would assist in determining the appropriate scope and direction for future work.”

In 2000, the ISRP asked whether the results obtained to date were sufficient, or whether the project should continue as a key component of basinwide monitoring. The question was again raised (and answered) in review. It is clear that the project has been a cornerstone for monitoring juvenile survival in the Columbia River system, and that it should continue for the foreseeable future. In summary, the proposal meets ISRP criteria, represents a particularly valuable project for the basin, and warrants continuation.

The proposal was selected by the Action Agency/NMFS RME Work Group for review. The ISRP concurs with the RME group observations on this proposal including opportunities exist for better aligning the work to RME objectives. Their primary conclusion was that this excellent proposal could better state the important implications in evaluation of compliance with performance standards at the BO-prescribed check in periods. They noted that ESU-specific life stage survival for juveniles and adults while migrating through the FCRPS are key performance measures detailed in the BO. The proposed research will generate smolt survival estimates for Snake River stocks of interest, albeit using primarily hatchery fish. The RME group also sought specification of sample sizes and precision associated with survival estimates, for without this information it is difficult to ascertain how useful the estimates will be in progress and compliance tests called for in the BO. They also noted that the performance standards in the BO are ESU-specific, whereas the estimates from this research involve only Snake River ESUs. They wondered whether there are opportunities to develop estimates for other stocks as well, such as Yakima and Leavenworth as Zabel et al. (2002) report, and encouraged expanding stock coverage, if tractable. Finally, the RME group mentioned that the BO focuses on wild fish survival, where this research uses primarily hatchery fish. Justification for using hatchery fish as surrogates should be discussed in the proposal.

If funded, this project should be coordinated with other monitoring projects to ensure compatibility of objectives, common methods and protocols. This coordination could be accomplished under the favorably reviewed CBFWA proposal #35033.

ProjectID: 35047

Evaluate Delayed (Extra) Mortality Associated with Passage of Yearling Chinook Salmon Smolts through Snake River Dams

Sponsor: NMFS

FY03 Request: \$1,083,900 **5YR Estimate:** \$4,946,100

Short Description: Determine if downstream migration through Snake River dams results in extra or delayed mortality.

ISRP Final Comments:

Fundable; agree with CBFWA's high priority ranking. The ISRP commends the proponent for efforts to address estimation of "extra mortality", which has been a contentious issue for many years. Of necessity, any study to address what the proposal refers to as a "hypothetical value" will be complex and require careful thought, analysis and planning. The proposal exhibits these features.

It has been argued by process of elimination that "extra mortality" is attributable to conditions experienced by smolts of Snake River stocks of chinook in their outmigrations through the hydrosystem. Arguments purporting to demonstrate the existence of "extra mortality" are primarily based on unconvincing comparisons with SARs of Lower Columbia River Basin stocks that are outside the Snake River. Since the differences observed favor the lower river stocks to a larger degree than expected based upon the "measured" in-river losses of upriver stocks, it was postulated that there might be an element of "delayed or extra mortality" that occurred in the ocean after the fish passed Bonneville Dam, the point of the last "measurement". In fact, the "measurements" consist of projections of average losses measured in the Snake River that are assumed to apply from McNary Dam to below Bonneville Dam. In our view, the assumptions and the methods used to develop the projections are of highly questionable validity.

The present proposal is adopting a definition of "extra mortality" as a component of mortality in a MCN-BON SAR attributed to conditions experienced previously in the in-river smolt passage LGR-MCN. This has a narrower focus than the PATH definitions, since it does not include the MCN-BON reach for smolt passage.

This is a design with two treatments and no control. The design measures MCN-to-BON SAR for two treatment groups: fish that were truck-transported as smolts LGR-ICE, and fish that spent equivalent truck transportation time going nowhere followed by in-river passage LGR-ICE. The truck-only treatment group is subject to "delayed mortality," and the truck-followed-by-in-river treatment group is subject to "delayed mortality" plus "extra mortality." This experiment provides information about delayed effects of transport plus passage through a differing number of dams for the two groups. It does not provide information about the effect of differing number of dam passages alone. There is an implicit assumption of additivity for these effects. With the additivity assumption, and the assumption that "delayed mortality" does not begin to be expressed until the fish are below MCN, one could calculate "extra mortality" as the difference between the mortality rates measured in the MCN-BON SAR for the two treatment groups. Regardless of the assumptions, there would be no opportunity just with this design to estimate "delayed mortality." Delayed mortality and extra mortality might be isolated by providing an additional experimental group not transported, as recommended in item 2 below.

A power to detect a 20% difference, with 95% confidence, 80% of the time, for the data from one year may be inadequate. This scenario is probably a best-case calculation, since variation between the within-year replicates may turn out to be large. If possible, the sample size should be increased.

The ISRP strongly recommends:

1) reaching an agreement so that the PIT tagged fish from the truck-followed-by-in-river treatment group from this project will always be returned to migrate in-river, rather than taken into transport, whenever they hit a bypass detector. This can be done automatically with the "sort by code" hardware at the collector dams (LGO and LMO). This will preserve sample size for this treatment group, and it will also present opportunities for stratifying on the number of bypass detections between LGR and MCN.

2) developing a method to estimate "delayed mortality" by using PIT tagged fish from outside this study but with coordinated release dates from the hatcheries to match batches of treatment groups from this study. An alternative would be to include an additional real control group of PIT tagged fish that are allowed to migrate in river from LGR to MCN, without the truck detour. This would permit estimation of "delayed mortality," which is not possible with the present design.

3) creating a CD of the "consensus interpreted data" as part of its annual reporting process. This would allow statistical researchers to try various statistical methods for analyzing these data, without the confounding issue of how the different researchers made their decisions about which data to cull.

Further recommendations are:

1) increasing the budget to create another treatment group that is collected at LGR and barged to the tail race of ICE. This would allow investigation of the question concerning whether the "delayed mortality" from truck transportation is the same as from barges.

2) estimating mortality from recoveries of fish released below Lower Granite Dam and recovered downstream. Similarly, estimating mortality for fish released below Ice Harbor Dam and detected at McNary Dam. This would allow directly estimating the mortality in transportation itself rather than assuming the usual 5% mortality rate used in modeling transportation.

Finally, it should be noted that the ISRP recommends that NMFS, CBFWA, and the Corps of Engineers concentrate on development of better estimates of SARs that will directly answer critical questions for recovery of endangered stocks in the Columbia Basin. For example, direct answers are needed to questions concerning return rates of transported versus in-river migrating fish, adequacy of return rates needed to recover stocks, indirect mortality, extra mortality, "D", etc. The ISRP has recommended elsewhere in this report, and again emphasizes the importance of installation of a PIT tag reader in the corner collector at Bonneville 2 (project 199302900). Data collected there will provide information that would more directly estimate SARs for groups of in-river migrants than the efforts in this project.

If funded, this project should be coordinated with other monitoring projects to ensure compatibility of objectives, common methods and protocols. This coordination could be accomplished under the favorably reviewed CBFWA proposal #35033.

ProjectID: 198910700

Statistical Support for Salmonid Survival Studies

Sponsor: UW

FY03 Request: \$265,850 **5YR Estimate:** \$1,409,650

Short Description: Improve monitoring and evaluation capabilities by developing better measurement tools and study designs to estimate juvenile and adult salmonid survival and survival relationships. Provide statistical guidance to investigators in the Columbia Basin.

Response Needed? Yes

ISRP Preliminary Comments:

Fundable (high priority). Disagree with CBFWA's Do Not Fund recommendation. This project develops analytical tools for tagging studies and provides support for the design and analysis of tagging studies to groups requesting assistance. This project offers a valuable system of checks and balances for evaluation of statistical analysis of complex tagging studies (PIT tags, radios, etc.) and other studies. The response provided details on past and present users of the products and services related to this project. The ISRP suggests that logs of time spent in client support be kept, client satisfaction surveys be collected, and these items be summarized and presented in support of future proposals.

ProjectID: 199105100

Monitoring and Evaluation Statistical Support

Sponsor: UW

FY03 Request: \$394,655 **5YR Estimate:** \$2,137,255

Short Description: Develop statistical methods for monitoring and evaluating salmonid recovery plans. Provide added-value analyses and statistical support on regional fisheries issues. Provide smolt migration timing predictions on the internet.

ISRP Final Comments:

Fundable (high priority). Disagree with CBFWA's Do Not Fund recommendation. The main elements of the project are to provide real-time analyses of PIT-tag data and smolt passage indices to predict outmigration timing and to provide value-added analyses of historical tagging data by testing hypotheses, estimating parameters, and investigating interrelationships. An additional element is to provide statistical assistance to the BPA and the NW fisheries community on an as-needed basis. The response provides information on clients and contributions. The project provides a valuable service. The ISRP suggests that in the future a summary of the following be provided in support of proposals: 1) data on the amount and nature of use of electronic data and analyses posted on the web, 2) responses to satisfaction surveys by internet users, 3) number of requests for analyses and the time taken to respond to those requests.

ProjectID: 35003

Vitality Based Studies of Delayed Mortality

Sponsor: UW

FY03 Request: \$207,180 **5YR Estimate:** \$1,060,638

Short Description: Based on the vitality survival model we will develop and deploy a field procedure to evaluate the contributions of freshwater events on delayed and extra mortality.

ISRP Final Comments:

Fundable, but at low priority. Agree with CBFWA "Recommended Action". The project is designed to characterize the factors contributing to delayed and extra mortality. The technical background is addressed well with references and links to other work. The problem of identifying and solving delayed and extra mortality problems is complex due a variety of mechanisms

through which mortality may operate. The proposed research is designed to study these mechanisms through theory, laboratory studies, and field studies. The study could be valuable in helping to resolve these complex issues. However, as noted elsewhere in this report (project 35047) the estimation of extra mortality would be better addressed with direct data on survival collected in the river.

The sponsor made a substantial and successful effort to address the ISRP comments. The response demonstrates that the project sponsor has explored connections with other projects and made definite plans to integrate this work with other projects. The sponsor has been instrumental in encouraging the several people working on delayed mortality questions to meet in a workshop. The workshop proceedings are enlightening. We encourage continued exploration of opportunities for integration with other projects.

ProjectID: 35011

The Floating Net Pen Transportation System Pilot Project

Sponsor: Columbia Basin Fishery Restoration L.L.C.

FY03 Request: \$3,291,275 **5YR Estimate:** \$10,196,875

Short Description: The transportation of Chinook salmon smolts in floating net pens from various fish hatcheries and collector systems to be released at the mouth of the Columbia River or in the Pacific Ocean.

ISRP Final Comments:

Do Not Fund; agree with CBFWA. The proposal is incomplete. While the response attempts to deal with many of the comments by the ISRP, it still falls short of being adequate to accomplish its stated objective, "Net pens are proposed as a low cost alternative to the present system of transporting molts in the Columbia River.", page 1 of the response. No method is described for comparing the performance (survival or return rates) of fish transported in net pens with those transported "in the present system".

ProjectID: 35023

Establish Relationship between Fish Passage Survival and Turbine Operating Efficiency

Sponsor: Normandeau Associates

FY03 Request: \$3,887,500 **5YR Estimate:** \$11,932,468

Short Description: Provide guidance to turbine operators for maximizing passage survival; provide quantitative information for turbine rehabilitation/replacement at dams; and assess whether survival targets are met

ISRP Final Comments:

Do Not Fund; agree with CBFWA. This is a proposal to determine if fish passage through turbines is least damaging at peak electrical generating efficiencies of the turbines, which is a commonly held belief that currently guides operations. A sub-objective is to establish whether consistent results are obtained from several turbines at the same dam, under the premise that turbines' effects may differ even when the turbines are nominally similar. The study would determine immediate mortalities and damages at McNary Dam using the proponent's balloon tag, longer-term effects after holding of test fish in tanks, and even longer-term survival of in-river fish tagged with sonic tags (all with appropriate controls released at the base of the dam). The ultimate objective is to establish more scientifically grounded rules for operating turbines for benefit of fish (or for balancing fish survival and power production).

This is a generally well-written proposal from a group with outstanding credentials. There is little doubt that they can achieve what they propose to do. The basic question is whether it is worth investing \$12 million to arrive at recommendations that might lead to improvements of 1 to 2% in survival of juvenile salmonids (based on the text and tables at the end of the proposal) that pass through turbines, particularly given the emphasis in the region on measures to divert the juveniles away from the turbine intakes. The question might boil down to an economic one, of how valuable it is to the power operators to be able to diverge from the criterion of operating within 1% of the peak efficiency of turbines? If it is quite valuable, in the millions of dollars, then it ought to be desirable for them to fund this study.

Aside from economics and FCRPS planning, the proposal does not meet the ISRP review criteria. It is strong on methodology (good science) but short on justification. The technique of balloon tagging has become a staple in hydropower survival studies nationally following patenting of the technique by the proponent. The approach, including the detailed statistical design, is well tested in the Columbia River basin and has been shown to be scientifically sound and fruitful (a useful table of results from many studies in the basin is included at the end). The novelty of this study is the inclusion of more than one turbine (to evaluate consistency of results) and longer-term, in-river survival (a topic for which the balloon tag work is often criticized). The study objectives, tasks and methods are described in adequate detail. However, the justification for this study is brief and incomplete. The previous studies are not well summarized to demonstrate that this proposal is the next logical step in obtaining more successful fish-passage. How much change in fish survival and electricity generation are we talking about in shifting from the peak efficiency level (large amounts, small amounts)? That is, what level of biological benefit (an ISRP review criterion) is at stake? What evidence is there now that adjacent turbines differ in their performance? What literature suggests that in-river mortality may be higher than indicated by the immediate or short-term effects shown by the balloon tag (and by how much)? The relationships of the proposed work to previous or on-going studies are given briefly and very generally (what are the project numbers listed in Part I?). The RPA's from the NMFS BiOp are listed, but neither named nor discussed as justification for this work. No priorities from the mainstem/systemwide province solicitation or program summary are mentioned. There is no mention of the Council's Fish and Wildlife Program, for which the ISRP must determine if the proposal is consistent. The whole project is considered one of "monitoring and evaluation" but the proposal would have benefited from a short discussion of how any operational changes implemented as a result of this study would be monitored and evaluated short of redoing this whole study.

In summary, the proposal falls short of meeting the ISRP review criteria. This is particularly true for the criterion of demonstrating likely biological benefit, which is slight. It might be better justified as a hydropower proposal.

ProjectID: 35034

Fish Behavioral Guidance Through Water Velocity Modification PHASE ONE

Sponsor: Natural Solutions

FY03 Request: \$285,020 **5YR Estimate:** \$1,104,596

Short Description: Field evaluation of a prototype mechanism for guiding juvenile and adult fish through a hydro facility. Test in situ the ability of induced turbulent flow and water velocity to simulate natural migratory cues for guiding fish to safe passage routes.

ISRP Final Comments:

Fundable. Agree with CBFWA's "Recommended Action," but this project could have application beyond the dams that would be relevant to the Fish and Wildlife Program such as at acclimation

ponds to stimulate migration. The response is thorough and shows a serious effort on the part of the sponsor to take advantage of comments received. The effort should be encouraged. This proposal has been improved from the innovative submission with additional input from biologists. The proposal gives a tantalizing view of what might be accomplished.

The potential value of this concept might be in the creation or enhancement of attraction flows at surface collectors or other bypass systems currently under development at dams in the Columbia Basin. Biological information already available ought to make it possible to develop criteria for deciding whether development and application of a large bore eductor would have the desired effects on guiding juvenile salmon. Mortality from effects of shear is a concern that can be tested with non-anadromous fish as proposed.

What is needed is a test with juvenile salmon that are ready to migrate downstream. Perhaps a test site could be found at Cowlitz Falls or at an acclimation pond somewhere in the Columbia Basin. As for demonstrating a full-scale application, reviewers agree with the proponent that this would be premature until the data the sponsor proposes to get are obtained and evaluated.

Data Management

ProjectID: 198810804

StreamNet

Sponsor: PSMFC

FY03 Request: \$4,211,435

5YR Estimate: \$24,027,308

CBFWA Adjusted FY03: \$2,261,033

3YR: \$7,148,077

Short Description: Provides regionally consistent, georeferenced data pertaining to fish and their habitats obtained from the basin's state, tribal and federal fish management agencies via the Internet at www.streamnet.org, and custom data services to FWP participants.

ISRP Final Comments:

Fundable in Part (Qualified). Agree with CBFWA's Core Program ranking, base funding recommendation, and comment to start a regional planning effort to provide guidance (see ISRP comments below). The base program is fundable and serves an important role in the Basin. In addition to the base program, the ISRP finds many of the additional tasks identified by Streamnet to be high priority for the region. We strongly support expanding the tasks and objectives of StreamNet to provide the most utility to the basin. Unfortunately, adequate information is not presented in the proposal to provide scientific review and fully evaluate the methods, budget, personnel, and infrastructure necessary to accomplish the listed tasks.

The Council could consider amending the base budget of StreamNet and partial funding of #35048 (NWFSC Salmon Data Management, Analysis, and Access for Research Monitoring and Evaluation Programs) to allow for prioritization and funding of some of the additional tasks proposed (see below). Obviously, StreamNet and the sponsors of #35048 would have to provide more complete study plans on each high priority task. The plans for capturing additional data could be reviewed by CBFWA staff and the ISRP. If the Council agrees to extend the period for consideration of funding of this and perhaps other monitoring proposals (e.g., new data to be captured by StreamNet and the NMFS Proposal #35048, Tier I monitoring proposed by #35016, and Tier III monitoring proposed by #35020) then the ISRP could review the set at a later time.

Council members should carefully review the roles that their respective States play in providing data to StreamNet. It would be helpful for the Council members to exert what influence they may have on their respective state government agencies to cooperate with and actively provide information to StreamNet using common methods and protocols. Also, much of the Tribal data from the various States are not currently included in the base program of StreamNet.

Much of the data collected by Fish and Wildlife Program projects are not readily available to the public in a timely manner from any source, and in particular, not from StreamNet (e.g., data from the various artificial production studies). We note that this is not a problem with StreamNet but rather with the failure of project sponsors to provide their data and metadata to StreamNet in a timely manner or to provide links from the StreamNet web site to locations of the data and metadata. Requirements should be implemented that all project sponsors provide their data in a timely manner after being provided adequate time to write final reports and manuscripts for the open scientific literature. Coordination of these efforts could be accomplished under the recommended CBFWA proposal #35033.

Of the new tasks (in parentheses) proposed by StreamNet, the ISRP would list 12 as urgent for evaluation of habitat and fish recovery efforts:

1. (#39) Start capture of data on straying and spawning of hatchery fishes and monitoring of spawning by wild populations where hatchery influences exist in Idaho, from the Tribes, and expand efforts in Oregon. The ISRP is curious as to why the State of Washington is not included.
2. (#6) Expand capture of natural spawner abundance data, e.g., anadromous data collected by USFS, BLM, Yakama Nation, and Nez Perce Nation.
3. (#8) Expand capture of hatchery release data, e.g., to Tribal hatcheries.
4. (#10) Expand capture of hatchery return data, e.g., to Tribal hatcheries.
5. (#26) Capture additional data for calculating return rates of hatchery and natural fishes by brood year for all priority basins in Oregon and start the process with the Tribes.
6. (#18) Capture new habitat restoration and improvement information from Idaho and Oregon. The ISRP is curious as to why the State of Washington and the tribes are not included.
7. (#20) Expand capture of information on barriers, e.g., culverts in Oregon and expanded information from Idaho.
8. (#22) Expand capture of information on diversions and screen status in Idaho and Oregon. The ISRP is curious as to why the State of Washington is not included.
9. (#3) under "Support subbasin planning." Capture subbasin planning data being collected and compiled.
10. (#40) Develop a water temperature database.
11. (#5) under "Data related services." Start an analysis function as a specific part of StreamNet.
12. (#30) Capture stream habitat data (currently very low priority in the base program).

Finally, we are concerned that the full function and potential value of StreamNet to the basin's scientific community are being encumbered by its steering committee. The ISRP believes that the scientific value of StreamNet to the region could be enhanced by a reorganization of its administration to provide greater autonomy.

If funded, this project should be coordinated with other monitoring projects to ensure compatibility of objectives, common methods and protocols. This coordination could be accomplished under the favorably reviewed CBFWA proposal #35033.

ProjectID: 199601900

Second-Tier Database Support

Sponsor: UW

FY03 Request: \$275,111 **5YR Estimate:** \$1,379,983

Short Description: Provide single-point, internet-based access to a subset of information to guide and support BPA's independent decisions pertaining to its responsibilities under the Power Act and Endangered Species Act.

ISRP Final Comments:

Fundable. Disagree with CBFWA's recommendation of Do Not Fund. This valuable project provides service to the scientific community in the region at relatively low cost. Specifically, it provides access to and analysis of data from multiple databases. Previous concerns of the ISRP with overlap of responsibilities between database projects have been addressed. In fact, some degree of overlap of services provided by second tier database projects (modeling, projections, analysis, use of multiple first tier (primary) databases) is healthy for the region, because it promotes careful evaluation of assumptions made in analyses of primary data. This project is also on the frontier in providing a prototype reporting and analysis application for access to distributed databases, a need that has previously been identified by the ISRP.

The project history and technical background sections are informative, and the sponsor provided careful and complete responses to the ISRP concerns with objectives, tasks, methods, and monitoring and evaluation. The sponsor understood and responded to the concern that quantitative projects that monitor and analyze data from other projects have an internal component for monitoring and evaluation of themselves. For example, a number of DART's tools report predictions of adult or juvenile passage, water quality and transport. These tools can be evaluated on the correspondence of predictions to observed data. Each year, DART provides an on-line, post-season analysis of the accuracy of these predictions.

Again, the ISRP would like to comment that we were somewhat confused by the Action Agency/NMFS RME Group Comments on this and other proposals. In other cases, e.g., proposal #35048, there is apparently strong support by the RME group for analyses of primary data to be conducted in second tier databases, whereas there is very weak support for similar analyses to be conducted by DART. The ISRP believes there is an inconsistency here.

The next proposal should include an evaluative summary of usage to date that indicates the distribution of use across different types of users, as well as the distribution of use across different products. It should include the details of a plan for how DART assesses demand for current and new products, the type of outreach that is done to assess demand, and methods used to inform and expand the user base.

ProjectID: 35010

An Interactive Biodiversity Information System for the Columbia River Basin

Sponsor: NW Habitat Institute

FY03 Request: \$432,950

5YR Estimate: \$3,079,050

CBFWA Adjusted FY03: \$460,926

3YR: \$1,656,380

Short Description: To complete development of a resident fish and wildlife information system on the Internet to allow users/resource managers to access, query, and retrieve spatial, text, and

ISRP Final Comments:

Fundable in part for the update and maintenance of the wildlife habitat database. Agree (in part) with CBFWA's Core Program ranking. This is a well-written and detailed proposal to provide needed wildlife data for subbasin planning. The approach is to enhance an existing internet site (IBIS) to provide biodiversity databases through an improved database management system. The IBIS site currently exists and is maintained by the Northwest Habitat Institute, but is inadequate and in need of improvement.

The goal is to have a more accessible common data management system of peer-reviewed data on fish and wildlife and their habitats that would provide consistent data throughout the basin. The project would provide information and services relevant to regional planning efforts. The data described would be useful in establishing resident fish and wildlife distributions and the linkages among them for subbasin planning. Objectives are to restructure the existing database on IBIS to allow concurrent use and more complicated data queries. Decision support tools and a manual will be developed. Proposers also intend to monitor the use and effectiveness of IBIS through user feedback.

The thorough response addressed the ISRP concerns. It indicates extensive regional agency involvement in the development of IBIS to date, with reasonable expectation of that involvement continuing. With regard to the resident and anadromous fish habitat data they recommend collecting, the ISRP believes that these data should be available to the region, but are unsure as to the utility of adding another database; e.g. with EDT and other concentrations on anadromous freshwater habitat.

Detail on the amount and type of usage is provided. IBIS data will be provided free of charge. A registration gateway to the site will generate data for monitoring use. Quality control mechanisms sound sufficient, and the on-line peer review process is described in more detail.

ProjectID: 35048

NWFSC Salmon Data Management, Analysis, and Access for Research Monitoring and Evaluation Programs

Sponsor: NMFS-NWFSC

FY03 Request: \$763,150

5YR Estimate: \$3,463,150

Short Description: Assess and consolidate all listed salmon related data and metadata sources in the Columbia Basin, develop and deploy Internet-based information repository and related analysis/reporting tools in support of science based research.

ISRP Final Comments:

Not fundable (qualified). Disagree with CBFWA's Recommended Action ranking. The ISRP is very supportive of the basic objectives of this project to capture primary data. However, the proposal is inadequate. It is too vague and general to be recommended for funding as written.

The sponsor proposes to: 1) make available unspecified NMFS data, 2) to capture and make available unspecified data necessary for NMFS to meet its obligations under the ESA, and 3) conduct unspecified analyses necessary for NMFS to meet its obligations under the ESA. The ISRP has no doubt that NMFS has primary data of interest to the region (some examples were given), that certain data are not readily available (some examples were mentioned), and that certain analyses are necessary for NMFS to meet its obligations under the ESA (some were mentioned). The ISRP believes that there is a strong need in the region to not only capture and provide additional primary data to the region, but also to allow the sponsors to analyze and provide “derived data” (with associated metadata and assumptions of the analyses). The ISRP believes that the scientific value of a database is enhanced when the people who administer the database are required to analyze some of it!

The Council could consider partial funding of #35048 and increased base funding of StreamNet (#198810804) to allow for prioritization and capture of necessary monitoring data (see the review of StreamNet and #35033). Obviously, StreamNet and the sponsors of #35048 would have to provide more complete study plans on each high priority task. The plans for capturing additional data could be reviewed by CBFWA staff and the ISRP. If the Council agrees to extend the period for consideration of funding of this and perhaps other monitoring proposals (e.g., new data to be captured by StreamNet and the NMFS Proposal #35048, Tier I monitoring proposed by #35016, and Tier III monitoring proposed by #35020) then the ISRP could review the set at a later time. If funded, this project should be coordinated with other monitoring projects to ensure compatibility of objectives, common methods and protocols. This coordination could be accomplished under the favorably reviewed CBFWA proposal #35033.

This proposal lacks sufficient technical detail for scientific review. Most objectives in the proposal have a Stage II step to identify the team, tasks, costs, etc. For example, the sponsor provided the following generic statement on most tasks “Detailed Project Plan: To be completed within four weeks of acceptance of funding. The plan will identify: the project team; all tasks; the estimated costs of each task including the cost of any necessary software and hardware and a detailed budget; any dependencies between tasks such as which task must finish before another can begin; who will complete each task; identification of a probable user group for the project; other needed consultation and participants; the actual deliverables such as code and documentation; the dates the deliverables are due; project team meeting schedule; project team reporting requirements; the project manager; and, the program manager to whom the project manager reports.”

The section of this proposal to monitor and evaluate the success or failure of itself, the proposed work, is inadequate. The response to the comment about potential overlap with other efforts illustrates an absence of collaboration with other agencies. Activities under this project provide an opportunity to strengthen StreamNet and other regional databases. We encourage NMFS to work more closely with the other State, Tribal, and Federal agencies through CBFWA to establish priorities for capture of additional needed data and to establish a comprehensive collaborative, systemwide monitoring and evaluation program.

Monitoring and Evaluation: Systemwide and Habitat Action Effectiveness

ProjectID: 35033

Collaborative, Systemwide Monitoring and Evaluation Program.

Sponsor: CBFWA

FY03 Request: \$998,763

5YR Estimate: \$2,996,293

CBFWA Adjusted FY03: \$968,800

3YR: \$2,906,404

Short Description: This project proposes an integrated effort of state, tribal and federal fisheries managers to catalogue, make available, critically assess, and improve system-wide monitoring and evaluation for fish and ecosystem status.

ISRP Final Comments:

Fundable. High priority. Agree with CBFWA's Core Program ranking. This proposal addresses one of the major management deficiencies in the basin, namely the lack of a coordinated basinwide monitoring program. Such a program is of critical importance for assessing changes in stock and environmental conditions and the effectiveness of restoration and mitigation actions. Thus, this proposal is of urgent priority for immediate funding.

The sponsors answered all questions and addressed all concerns expressed by the ISRP in our preliminary review including the need for independent oversight and outside peer review. This project provides an urgently needed umbrella framework to 1) collaboratively develop systemwide M&E protocols and 2) coordinate data collection activities, protocols, and standards. The basic objective of the Collaborative System wide Monitoring and Evaluation Program (CSMEP) project is a coordinating mechanism for individual M&E projects rather than assuming all M&E activities into itself.

It appears to the ISRP that this proposal is in direct competition with the planned activities of the Action Agency/NMFS RME Group. Competition between the RME Group, currently funded by BPA, and this project CSMEP (#35033), proposed by CBFWA and recommended by the ISRP, is a problem to be resolved in the political arena. We emphasize that resolution of this competition and development of a coordinated Columbia Basin wide monitoring program is critical for collection of the best quantity, quality, and utility of scientific data to evaluate the efforts of the region to recover fish and wildlife habitat and populations.

Several ongoing monitoring and database projects are already under the general direction of the CBFWA or advisor committees made up of mostly CBFWA members, including parts of or all of projects #198810804 (StreamNet), #198712700 (Smolt Monitoring), #199008000 (PTAGIS), #199403300 (FPC), and #199602000 (CSS). If #35033 is funded then the functional melding of #35033 with these projects is likely assured. CBFWA as the project sponsors do not propose to formally bring other existing M&E projects under this project in the foreseeable future, but rather to coordinate activities with these other projects, and collaboratively improve the systemwide information to aid decision-making. As proposed by CBFWA, project #35033 does not propose to incorporate administration and implementation of these projects, or to dictate individual project M&E actions and protocols for existing M&E projects. However, project #35033 does propose to integrate relevant Tier 1, 2 and 3 data from component programs into a systemwide M&E program, and make recommendations for filling critical information gaps related to key management questions facing the region.

It was refreshing to see in the NMFS Proposal #35019 (Develop and Implement a Pilot Status and Trend Monitoring Program for Salmonids and their Habitat in the Wenatchee and Grande Ronde River Basins) that one of the Action Agencies agrees with the ISRP that the CBFWA proposal #35033 contains the necessary collaborative components to implement a comprehensive monitoring program basinwide. We note that NMFS is also an active member of the CBFWA. Proposals #35033 and #35019 (and by extension, parts of the other NMFS proposals #35016, #35020 and #35048) could be combined with other ongoing projects to provide a systemwide monitoring and evaluation project. The ISRP could not agree more with the statement in the NMFS proposal #35019 that “The absolutely essential elements of 35033 that the other projects lack is the basinwide perspective, both in the collaborative representation of nearly all fisheries management agencies, as well as the inclusion of fishes other than anadromous salmonids. Ultimately, the most efficient manner for the Columbia River basin to approach a comprehensive monitoring program would be in the form of integrated aquatic ecosystem health assessment. Components of the above 5 projects, plus many ongoing monitoring programs, if coordinated within a single purpose, design, and data management and evaluation framework, could produce the ideal monitoring program for the basin’s aquatic natural resources.” Unfortunately, there are some technical deficiencies or incomplete methods in the NMFS proposals #35016, #35020 and #35048 and the ISRP cannot give unqualified support to these proposals at this time.

The proposed Project #35033 is broader, both in scope and participation, than other M&E projects proposed in the systemwide province and, therefore, has a higher probability of success and should receive priority for immediate funding. The CSMEP project provides an environment for developing and coordinating common data collection protocols and standards. Several logistical and institutional issues remain to be resolved, but the ISRP believes that this proposal has the best potential to significantly improve the quantity, quality, and utility of scientific data for evaluation of fish and wildlife recovery efforts in the Basin.

ProjectID: 35016

A Pilot Study to Test Links Between Land Use / Land Cover Tier 1 Monitoring Data and Tier 2 and 3 Monitoring Data

Sponsor: NWFSC

FY03 Request: \$436,000 **5YR Estimate:** \$2,582,000

Short Description: Pilot test use of LU/LC spatial data in Willamette subbasin as Tier 1 monitoring data base, link to Tier 2 fish data in Willamette River floodplain and Tier 3 data for floodplain restoration projects; transfer lessons of same to John Day/Wenatchee

ISRP Final Comments:

Not Fundable. Disagree with CBFWA’s High Priority ranking. The proposal was to apply findings from the use of spatial data in the Willamette River subbasin to other subbasins. The main objective is to link LU/LC data to field data to improve understanding of changes in riparian and aquatic resources. This appears to be a good idea. However, the proposal was inadequate and did not provide enough detail to effectively evaluate its merit or to warrant further response review.

The respondents submitted a completely new proposal that the ISRP hasn’t had an opportunity to evaluate and discuss as a group. If this proposal were to be reviewed at this time it would be without oral presentation, the opportunity to ask questions of the presenter, and a response loop. The ISRP feels that to allow submission of an entirely new proposal after receiving a rating of

“not fundable, no response necessary” as part of the mainstem and systemwide process would be unfair to other sponsors and would set a harmful precedent to the review process.

However, this proposal may provide a critical level of monitoring that should be considered urgent for funding in the Columbia Basin. If the Council agrees to extend the period for consideration of funding of this and perhaps other monitoring proposals (e.g., new data to be captured by StreamNet and the NMFS Proposal #35048, Tier I monitoring proposed by #35016, and Tier III monitoring proposed by #35020) then the ISRP could review the set at a later time.

If funded, this project should be coordinated with other monitoring projects to ensure compatibility of objectives, common methods and protocols. This coordination could be accomplished under the CBFWA proposal #35033.

ProjectID: 35019

Develop and Implement a Pilot Status and Trend Monitoring Program for Salmonids and their Habitat in the Wenatchee and Grande Ronde River Basins

Sponsor: NMFS-NWFSC

FY03 Request: \$270,000

5YR Estimate: \$2,350,000

CBFWA Adjusted FY03: \$250,000

3YR: \$1,250,000

Short Description: This proposal seeks to develop, as subbasin scale pilot programs, status and trend monitoring efforts for anadromous salmonids and their habitat in the upper Wenatchee and Grande Ronde River basins.

ISRP Final Comments:

Fundable (qualified). Agree with CBFWA’s Urgent ranking. The sponsors adequately and carefully addressed the ISRP’s concerns relative to potential overlap with other proposed monitoring and evaluation programs. In addition, the responses to the ISRP’s concerns on individual technical issues were thoughtful, complete, and persuasive.

The response to our concerns indicated a refreshing willingness to cooperate in the difficult task of development of a comprehensive monitoring and evaluation program for the Columbia Basin and Subbasins. The ISRP recommends that this project be funded if the sponsors follow through with their commitment to cooperate under CBFWA’s umbrella proposal #35033. The sponsor agreed with the ISRP preliminary review comment that the CBFWA proposal #35033 contains the necessary collaborative components to implement a comprehensive monitoring program in the subbasins and the entire Columbia basin.

The ISRP agrees that proposals #35033 and #35019 (and by extension, parts of the other NMFS proposals #35016, #35020 and #35048) be somehow combined to provide a systemwide monitoring and evaluation project together with the many ongoing M&E efforts (e.g., StreamNet, coded wire tagging program, smolt monitoring by the FPC, the Idaho Production Studies, DART, ongoing M&E in the John Day Subbasin, etc., etc.). The ISRP could not agree more with the statement that “The absolutely essential elements of 35033 that the other projects lack is the basinwide perspective, both in the collaborative representation of nearly all fisheries management agencies, as well as the inclusion of fishes other than anadromous salmonids. Ultimately, the most efficient manner for the Columbia River basin to approach a comprehensive monitoring program would be in the form of integrated aquatic ecosystem health assessment. Components of the above 5 projects, plus many ongoing monitoring programs, if coordinated within a single purpose, design, and data management and evaluation framework, could produce the ideal monitoring program for the basin’s aquatic natural resources.” We see no advantage to

fragmentation of the regions efforts to monitor and evaluate recovery efforts for anadromous and resident fishes.

ProjectID: 35020

Regional Project Effectiveness Monitoring Program for Columbia River Basin Listed Anadromous Salmonids.

Sponsor: NMFS-NWFSC

FY03 Request: \$475,000 **5YR Estimate:** \$2,010,000

Short Description: This proposal seeks to coordinate the design and implementation of experimental monitoring projects aimed at determining the impact of specific habitat actions. As part of this effort, it will coordinate and implement 2-3 pilot projects.

ISRP Final Comments:

Not fundable. Disagree with CBFWA's Urgent ranking. The proposal lacks sufficient technical detail to allow scientific review and evaluation. This is a proposal to develop a proposal, rather than a proposal describing specific projects. The objectives of this project are worthwhile, but the proposal and the response lack sufficient technical detail to permit scientific evaluation. The need for the project, alone, does not justify funding. The proposal should contain specific objectives for each pilot project, detailed experimental designs, methods of data analysis and specific empirical methodologies for obtaining the data.

We note the overlap of the overall objectives of this proposal with those submitted by ESSA in their "innovative project proposal." The approach proposed by ESSA is that of an observational study leading to comparison of watersheds or stream reaches by standard statistical methods, e.g., regression modeling techniques and other empirical methods. The ESSA approach leads to standard, acceptable scientific inferences, however we grant that the approach does not lead to the same level of "cause and effect" relationships as true treatment-control experiments.

Even though it is important to include controls and create a true experimental design, we caution the sponsor on the difficulty of designing adequate paired or BACI (treatment-control) experiments on the scale indicated. It is difficult to find and maintain the number of replicates of treatment and control stream reaches necessary to carry out the design and analysis. Also, the presence of confounding factors introduces extreme variation in measured variables (e.g., in evaluation of the effects of additional large wood in streams, some of the streams may have livestock fenced out and others may not). The ISRP's experience with projects like the Idaho Supplementation Study (ISS) lead us to believe that the fundamental elements of the design of the proposed pilot projects may not be feasible. In the ISS, study sponsors had extreme difficulty obtaining and maintaining treatment and control streams that can be captured in a rigorous experimental design. Similar logistical problems in the proposed pilot projects will likely limit conclusions that can be drawn.

The sponsors propose to work with other ongoing project managers to implement their pilot monitoring projects. This will require extensive regional buy-in and therefore to be successful, this project should be coordinated with other monitoring projects to ensure compatibility of objectives, common methods and protocols. This coordination could be accomplished under the CBFWA proposal #35033.

There are severe deficiencies with the present proposal to develop a proposal. However, the ISRP grants that if the objectives could be met, such a project would provide critical monitoring of habitat recovery efforts in the Columbia Basin. If the Council agrees to extend the period for

consideration of funding of this and perhaps other monitoring proposals (e.g., new data to be captured by StreamNet and the NMFS Proposal #35048, Tier I monitoring proposed by #35016, and Tier III monitoring proposed by #35020) then the ISRP could review the set at a later time.

ProjectID: 35017

Inventory and Synthesis of Physical Process Models and Methods to Supplement Habitat Conditions Analysis and Subbasin Planning

Sponsor: KWA and Golder

FY03 Request: \$769,609 **5YR Estimate:** \$1,730,082

Short Description: Engage earth scientists, civil/systems engineers, geomorphologists, hydrogeologists and others familiar with the science of physical processes. Conduct a synthesis inventory of tools and develop a Landform Library, database, web based app. and model.

ISRP Final Comments:

Not Fundable. Disagree with CBFWA's Recommended Action. The proposal is inadequate and a response was not requested. This long rambling proposal did not provide adequate detail in the critical Section f. Proposal objectives, tasks and methods to allow review of methods (methods are too brief). In future proposals the proponents might consider reducing the level of effort and propose to produce a directory of and synthesis report containing protocols and recommendations for how and when physical process methods should be used. Proposals must include a monitoring and evaluation section. It is not appropriate for one of the most quantitative proposals to not have a quantitative monitoring and evaluation plan for success of the project.

The proponents propose to link the biological and physical worlds through cause and effect processes and to develop an overarching "model" called the Physical Process Method (PPM) process. The project would provide input to the EDT process of evaluating aquatic habitat and predicting effects of habitat changes on anadromous fish populations. The ISRP is not convinced that a highly sophisticated mathematical approach in combination with EDT is appropriate at this time. The sub-models are available (and some were listed in the proposal) for many of the processes they want to link. Users may be better off to leave them unlinked and use them as needed, based on the combined expertise of several disciplines working together. An overarching Physical Processes Model may gain little not available from individual models for discrete processes. However, part of Phase 1, a directory of and synthesis report containing protocols and recommendations for use of individual physical process models in subbasin planning, may be useful. The ISRP agrees that a useful form for this inventory would be the style of presentation of protocols in the report "Inventory and Monitoring of Salmon Habitat in the Northwest: Directory and Synthesis of Protocols for Management/Research and Volunteers in Washington, Oregon, Idaho, Montana and British Columbia" by Johnson, et al. 2001.

ProjectID: 35022

Habitat Mitigation Tracking System

Sponsor: STEWARD AND ASSOCIATES

FY03 Request: \$462,131 **5YR Estimate:** \$1,372,107

Short Description: Assist BPA in meeting its habitat mitigation obligation and, if appropriate, receiving credit, as specified under RPAs 180 and 183 in the FCRPS Biological Opinion.

ISRP Final Comments:

Fundable (qualified). Disagree with CBFWA's Do Not Fund ranking. This proposal outlines work designed to ensure that mitigation projects make a positive, measurable contribution towards salmon recovery, that BPA receives credit for its efforts, and that additional mitigation opportunities and constraints are identified and communicated to fish and wildlife managers and

the public. The response is complete, adequately addressing ISRP review comments. However, we raise the same concern with this project that we have indicated for the RME program in terms of duplication and fragmentation of effort. An entirely new database system for habitat projects is being proposed. The ISRP agrees with CBFWA that there is extensive overlap with #35033 and that to be successful this project would have to have regional buy-in. The project contains good ideas that would enhance the scientific credibility of the monitoring data. If funded, this project should be coordinated with other monitoring projects to ensure compatibility of objectives, common methods and protocols. This coordination could be accomplished under the favorably reviewed CBFWA project #35033.

ProjectID: 35045

Modeling and Information Management System to Assess Effectiveness of Alternative Actions

Sponsor: PNNL

FY03 Request: \$500,000 **5YR Estimate:** \$1,500,000

ISRP Final Comments:

Do not fund. Disagree with CBFWA's Recommended Action ranking. This proposal is to develop a model and information system (MADIMS) to support the RME program by developing 3 functional capabilities: 1) spatial and temporal scale changes in data, information and models; 2) hypothesis testing; 3) information exploitation. The goal of building a complex model to allow alternative actions to be evaluated without experiments is laudable. The difficulty is in the details of building a model that is realistic enough to be useful, yet tractable for solution. Models may predict cause-effect relationships but to establish such relationships requires links to empirical data.

The ambitious goals of using a system to manage models and data to capture cause-effect relationships in the region seem to be unattainable. The proponents exhibit an expectation that models can establish cause and effect relationships. Furthermore, the proposed framework supports identifying and prioritizing future model developments raising a concern about how models will be selected for inclusion and how competing models be compared?

The response overall, while interesting in its description of the application of neural networks and fuzzy logic in information-poor environments, does not allay earlier concerns that the modeling framework to be developed would have "legs" in the region; i.e. be adopted and used in a way that will enhance understanding and knowledge. The response to questions about the budget fails to provide information as to its components and magnitude. Finally, every research project funded by the Council's Fish and Wildlife Program must have an adequate monitoring and evaluation plan.

ProjectID: 35050

UW Offsite Habitat and Fish Survival Effectiveness Monitoring

Sponsor: UW

FY03 Request: \$177,048 **5YR Estimate:** \$1,074,065

ISRP Final Comments:

Do Not Fund; agree with CBFWA. The proposal is inadequate. The proposal is not clearly written, is not well-coordinated with action agencies and other proposed and ongoing monitoring programs within the basin, and it does not have enough methodological detail to provide a clear understanding of how the work will be done and what the products will be like. It isn't clear from the regional perspective why this project should be the one to do the activities described or that the activities described are even appropriate or possible.

Harvest

ProjectID: 200100700

Evaluate live capture selective harvest methods for commercial fisheries on the Columbia River 2001-007-00.

Sponsor: ODFW and WDFW

FY03 Request: \$579,039

5YR Estimate: \$3,199,548

Combined Budget/CBFWA Adjusted FY03: \$923,551

3YR: \$2,680,653

Short Description: Evaluate the use of live capture commercial fishing gears and methods to capture hatchery-produced spring chinook and minimize catch of, and impact to, bycatch including ESA listed species.

Combined with:

ProjectID: 35018

Evaluate recreational and commercial mark-selective fisheries.

Sponsor: WDFW; UI

FY03 Request: \$797,420

5YR Estimate: \$2,292,260

Short Description: Estimate post-release survival of steelhead bycatch in tangle net fishery. Evaluate post-release spawning success of spring chinook and steelhead. Measure hooking mortality in recreational salmon fisheries.

ISRP Final Comments:

Given the extensive comments initially provided on these proposals, and the anticipated concern with the ISRP final recommendations, the detailed preliminary ISRP comments on both proposals have been left in this final ISRP discussion.

ISRP Preliminary Comments 200100700:

The development of selective fishing methods for commercial fishermen was supported by the ISRP in the FY2001 Innovative proposals and again by BPA in 2002. This proposal is a continuation of work begun under those proposals. The statement objectives of this proposal were (target species is spring Chinook and bi-catch issue is winter steelhead):

“Objective 1. - Determine effects of varying net mesh size on species-specific catch rates, condition at capture profiles, immediate-, short-, and moderate-term survival rates.

Objective 2. - Investigate the feasibility of using live capture fishing methods and gear in a full fleet commercial fishery.”

However, while this proposal is now substantially more expensive than previous version, it is not clear what, if anything, new would be gained by this research. One reviewer summarized the proposal as more socially motivated than scientifically driven. There are significant issues with the current proposal:

a) While the general background and broad results are summarized from past work, there are no actual data or analyses presented, nor are there any experimental designs presented for the proposed research. The way that past research results are presented is confusing and limits the understanding about what is known, what is unknown, and the quantitative results. There is also no sense of an integrating experimental design to this project.

- b) The results of the 2002 study of a commercial fishery are initially used as the basis for suggesting more research in 2003 since the bi-catch of winter steelhead was so large and inadequate data on mesh size were collected. However, in task 2, these same 2002 data are to be used in establishing the 2003 regulations but in the absence of any results from the 2002 research. How then does the 2003 commercial fishery “experiment” build on new information and how would the steelhead bi-catch issue be addressed? For example, what mesh size is proposed for the 2003 fishery?
- c) Given (b), what is new that would allow improved protection of steelhead in the commercial fishery? What allowable mortality of steelhead and unmarked spring Chinook is provided for the experimental commercial fishery and how will it be incorporated in the regulations and monitored? If the fishery is limited to 1-2% of the winter steelhead return, how would you know when such a limit was met?
- d) A commercial fishery introduces an additional mortality that small test sampling does not involve, i.e., the potential for multiple encounters and cumulative mortality of the released fish. This issue was asked at the presentation but there did not seem to be a plan to address this in the proposed monitoring.
- e) While the committee could infer the definitions of immediate, short-term, and moderate-term mortality; clearly, such fundamental terms should be defined in the proposal. Further, the ISRP has previously asked how delayed mortalities would be measured.

This proposal is driven by a need to find ways to increase gear selectivity in order to be able to continue in-river commercial fishing on hatchery fish while continuing to protect co-distributed weak stocks. The strategy is to find more selective harvest methods and effective live-release techniques. Although the proposal says it is to evaluate aspects of live capture commercial fishing gears and methods, the project is limited primarily to a single gear (tangle nets) methods of using and configuring that gear (drift length, mesh size, the use of recovery boxes for fish to be released) and the degree it can be used successfully by gillnet fishermen.

Reference is made to data from previous experiments not being adequate to address certain questions, but it is not clear whether the proposers have a plan to ensure that the proposed work does deliver data adequate to answer the questions. The structure of the experimental design does not seem to have been clearly thought about. What statistical analysis is proposed to determine significance of differences? What are the data requirements of this analysis? What sample design follows from the data requirements? How does the beach seine function as a control? It is not clear from the proposal the extent to which the proposed work is new versus a repetition of previously conducted experiments. Objective 2: Continue to investigate feasibility...creates the impression of an ongoing project that will never end.

Reference is made to enforcement and compliance – how does this fit with the full observer coverage on vessels? Is enforcement a post-project issue? Further, enforcement and compliance are fishermen behavior issues that the fishery should pay, or at least, contribute to. The development of these fishing techniques clearly are to the benefit of those fishers, have they been approached to monitor their fishery.

Why does this need to be a five-year project? A strong justification would be needed for 5 years!

The ISRP clearly sees the merit in developing new fishing techniques given the number of factors limiting fisheries in the Columbia River. However, the provision for these fisheries must stand-up to technical review and compliance with ESA limits on protected stocks. Based on the material presented in this proposal we cannot make that assessment and cannot, at this time, conclude that this new proposal would provide a sound scientific basis for such an assessment.

NOTE: Objective 1 of this study is very similar to the study proposed by WDFW (#35018), both use radio tagging of fish captured and released from experimental fishing but differ in the methods proposed to capture fish for control treatments. Objective 2 is specific to this proposal. It should not be necessary for the Council to consider two essentially identical research projects on this issue. The proponents should reconcile these two proposals before any further funding is provided, including their respective definitions of soak times.

ISRP Preliminary Comments 35018:

This proposal is similar to proposal #200100700 (ODFW) and addresses incidental mortalities associated with mass-mark selective fisheries in the Columbia River. Fishery managers have implemented mark-selective fisheries in both the commercial and recreational sectors to preserve declining and listed salmonid populations while providing harvest on healthier stocks. In these fisheries, the marked fish (hatchery-origin) may be retained while the unmarked portion (which would include listed wild stocks) must be released. The assumption is that the survival of the released fish is high enough that they will contribute to rebuilding weak populations. The ODFW proposal considered mesh-size to use in tangle nets and evaluation of a “full fleet” commercial fishery on spring Chinook.

The objectives of this WDFW proposal are:

- 1) to estimate the survival of steelhead captured and released from a tangle net that would be suitable for harvesting spring chinook salmon;
- 2) to estimate the effect of capture and release from a tangle net on the condition and spawning success of spring chinook salmon and steelhead in the Kalama and Cowlitz river systems; and
- 3) to estimate the survival of spring chinook, coho and fall chinook captured and released in a mark selective recreational fishery conducted below Bonneville Dam.

The proposal would estimate these survival rates using a series of mark-recapture experiments over the next three years.

Objective 1 is very similar to the study proposed by ODFW (radio tagging of fish captured and released from experimental fishing) except for differences in the methods proposed to capture fish for control treatments. Objective 2 and 3 are specific to this proposal. It should not be necessary for the Council to consider two essentially identical research projects on this issue. The proponents should reconcile these two proposals before any further funding is provided, including the respective definitions of soak times.

This proposal provides more background on past studies and presents some analyses. The reviewers particularly noted the difference between comparisons of short term survival estimates by gear type and the results of the long-term survival studies. Short term survival rates of released spring Chinook were quite comparable between three treatments but long-term survival of fish released from the conventional gillnet were only 50% of the control compared to 91% for the tangle nets (section 9b). Consequently, Objective 2 seems a logical extension of these longer-term studies and merits support. We also agree with the author’s comments concerning the variability in catch-and-release mortalities in recreational fisheries and would support the Objective 3, following consideration of our comments on the use of controls (below).

In Objective 1 and 3, the ISRP had concerns about the source of the control fish and whether they are comparable to the treatment fish. Objective 1 involves radio-tagging released fish caught in tangle nets fished downstream from Bonneville Dam. The proposed controls would be captured in the Bonneville fishway, radio-tagged, and released back to the fishway. While the authors

acknowledge concern about this comparison they do not offer a solution. We recommend this be considered further and offer the following suggestion:

To improve the control, consider taking half the experimental fish up to the Bonneville Ladder and release half at the net site or half of the control fish downstream to be released. The Null hypothesis is no difference in survival of the two groups. If there is significant loss between the two groups, the assumption would be violated and the control procedure compromised.

Similarly, Objective 3 involves capture of control fish in the fishway but the tags proposed in this study are colored jaw tags, not radio-tags. This situation is more difficult to assess since any loss of tags released downstream from the fishery could be due to emigration from the study area, tag loss, or mortality. A response is required on both control issues.

There are two other specific points for consideration:

a) Task 1a states that for each steelhead captured, they will note the net type (mesh size) it was captured in and estimate the depth from the top of the net at which it was captured. Unless this depth definition is very general, quantification of this is variable and slow when handling a gillnet. A more direct means to investigate the depth of steelhead encounters would be to use variable depth “weed” lines, as conducted by CDFO, or to apply depth monitoring tags (the former is much cheaper). Weed lines allow the gillnet to be set at varying depths below the surface to investigate changes in the encounter rates with steelhead. Were these other methods considered and/or how will depth of capture in the gillnets be measured?

b) Hypothesis 1, Objective 2 appears to establish an acceptable difference in egg-to-fry survival of winter steelhead and spring chinook salmon released from tangle nets. What is the basis for “will not be greater than 10% different than that of fish not captured”. Is 10% based on other studies, measures of variation, etc.?

Two budget concerns are notable. First, Task 2c. Compare spawning success of tagged and untagged spring chinook salmon in Kalama River is contingent upon funding of proposal #35041. Secondly, the budget presented in section 8 should include more justification/explanation for the 14 FTE and fringe rate applied, the very large travel budget (\$163k per year), and the equipment to be purchased with the capital is very generally mentioned in section 9g but should be more explicitly stated.

ISRP Final Recommendations on the combined proposal:

Fundable in part, Objectives 1-3 moderate to high priority. During the response cycle, Project #200100700 and #35018 were combined under #200100700. The objectives combined from the WDFW 35018 are fundable (objectives 1 to 3 in the current). However, for the two objectives originally under 200100700, the research components of objective 4 are fundable, but objective 5 is not fundable. Disagree with CBFWA’s Urgent recommendation and disagree with the funding reduction proposed by the sponsor.

The combination of the two proposals recognized the ISRP comments, and the WDFW researchers reconsidered a number of their proposals in light of those comments (e.g., the controls). Reviewers are not, however, as positive about the responses from ODFW. The two ODFW studies to be included were the studies of mesh size and net structure on immediate and short-term mortality (objective 4); and then the feasibility test of a mass-mark selective commercial fishery (objective 5). The latter was the focus of an extensive response received from Washington Trout, Oregon Trout, and the Native Fish Society (Gayeski response) that was considered by the ISRP during their review. While the ISRP still had a number of small comments on the WDFW proposals, the sponsors adequately replied to our questions.

The ISRP was not so certain for the ODFW responses, particularly about our concern for multiple encounters in the commercial fishery, or who should fund the enforcement of that fishery. Further, given the extensive comments in the Gayeski response (and presented to the Columbia River Compact meeting, July 25, 2002), the ISRP is strongly inclined to recommend proceeding with the research components of objective 4 only but defer any support for a commercial fishery trials (objective 5) until the requirements under the ESA are established, appropriate mesh sizes and associated mortality rates are determined, and all users agree on the fishery. It is clearly not the position of the ISRP to make recommendations about fisheries, but we can advise when the technical assumptions and analyses do not seem to support such an expansion of this research program.

Numerous analytical questions remained concerning the 35018 response. That response did provide some preliminary analysis of the 2002, but not the data from 2000 and 2001 that were used in decisions to continue and expand the commercial trials. For 2002 data, marked and unmarked Chinook and steelhead are aggregated. Were there differences between marked and unmarked fish in condition at capture or in levels of delayed mortality? How was the sample size -- number and proportion to examine -- determined? (.7% Chinook total catch sampled for condition at capture; 3.7% steelhead). What were the proportions of marked and unmarked fish in the samples? How informative are the pooled data collected under different protocols? The focus in 2003 would be on 3.5" and 4.5" mesh. If mesh size and gear configuration are changed from the past fishery, how useful are the regressions estimated only on mesh size? How will the multivariate data for mesh size, hanging ration, etc be analyzed? What sample design does the project have to support the analysis? Mention is made of ANOVA techniques, but the question about sample design to support the ANOVA is not answered. Sample size for the monitoring program is also not addressed.

The response describes the process for choosing mesh size for the 2003 fishery: this will not be based entirely on data from the project but will be decided by the two state fish and wildlife commissions. Decisions about ESA protected steelhead will be made to keep "impacts" within 2%. Impacts to wild steelhead would be estimated using data from the project, but are wild and hatchery steelhead analyzed separately? Is the sampling rate of wild steelhead sufficient to calculate impacts? "Impact" isn't defined, but presumably assumptions about post-release survival will influence their determination. Immediate and short-term mortality are defined; moderate term mortality is not.

Overall, the response concerning #35018 does not provide confidence that the work will be conducted according to scientific standards. This ISRP was particularly surprised that comments were not submitted from the proponents of 35018 concerning the analyses presented in the Gayeski response and to the Columbia River Compact prior to the ISRP's preliminary report.

ProjectID: 35004

Harvest Model Development

Sponsor: UW**FY03 Request:** \$278,398 **5YR Estimate:** \$794,416**ISRP Final Comments:**

Do Not Fund; agree with CBFWA. There is not clear Regional support or need for developing these new management models. In the absence of strong user-group agreement on a management model, investment in this work is very likely to be ineffective and potentially controversial. The ISRP does not necessarily disagree with duplication of models as new ideas/methods and verification of results could be important results. However, without clear regional support, the potential development of competing models is not a wise investment.

This proposal initially caused some confusion. The PI began his presentation by suggesting that the proposal should not be funded. His statement related to differences of opinion between the PI and the model users, i.e., the salmon management agencies and the Chinook Technical Committee (CTC) of the Pacific Salmon Commission. The proposal would not be effective if not supported by these key users. The proposal, however, looks generally acceptable and the development of new models to reflect new management needs for selective fisheries as expressed in the BiOp RPAs appears to be a reasonable suggestion. The proposal makes an effective argument for the benefit of models that will provide managers with information they need to minimize catch of protected stocks. The proposal explains how existing data will be used to model the new questions about harvest management.

The ISRP review questioned the rationale for producing two basically similar models, whom requested these new models when existing models are being used, clarification of the PI's comments about the need for managers to be conversant in model codes, and whether the data existed to develop these new models (e.g., data on gear selectivity, incidental catch, and incidental catch mortality)?

The ISRP also stated that they were uncertain of the necessity for this proposal since the CTC is proceeding with modifications of their model and the basis of the request for a BiOp model is not presented. The ISRP noted a potential problem of alternative models and would not be supportive of this proposal unless the proponent can clearly demonstrate support of the user community for this proposal and whether a model for assessment of harvest alternatives would be useful in the Basin as an effective recovery tool.

The ISRP also provided a programmatic note: some connection to enforcement goals of the region should be coordinated with harvest management tools. Previous M&E (Peters et al., 1997) have shown enforcement is most effective when harvest rules are simple and easy to enforce.

The response was thorough to the questions raised by the reviewers, but we conclude that it confirms the PI's comment that the proposal is not fundable due to lack of support from the user groups. If there is not clear support or need for developing new management models, then fundamentally the ISRP cannot support this proposal. The ISRP has again clarified that the CTC has already proceeded to further develop their model, that their work is supported by all management agencies involved, and that NMFS has begun work on a BiOp-oriented model.

As a program note, however, the ISRP was not particularly concerned about a duplication of models if the work had regional support. The idea that two models are undesirable has two sides:

one is the cost efficiency and potential for conflicting answers, but the other is the role of independent development and verification. Ironically, the CTC model noted in this proposal has already been through the latter process during the development of the Coast model. As for the BiOp model, the author makes a valid point that one coast-wide model may not have the terminal fishery detail desired. There is a valid concern in this comment but the specification of the model and regional support must be clarified. Any terminal run model will, however, have to be associated with the CTC model since terminal returns are contingent on what occurs in the ocean fisheries addressed through the Pacific Salmon Commission and the CTC.

ProjectID: 35040

Determination of post-release survival of spring chinook salmon in a mark-selective sport fishery

Sponsor: PNNL

FY03 Request: \$268,745 **5YR Estimate:** \$844,795

Short Description: Determine the effects of capture and release by angling on the post-release survival of spring chinook salmon and steelhead. Different groups (one control, one treatment) will be radio-tagged and tracked through spawning.

ISRP Final Comments:

Not fundable. Disagree with CBFWA's Recommended Action ranking. Although interesting and relevant, the study is not fundable due primarily to inadequate statistical design considerations to answer the questions or test the hypotheses as presented. No statistical treatment to demonstrate that even the primary hypothesis was likely to have sufficient sample size was delivered after this question was raised. Sub-hypotheses about the population structure appear even less likely to be adequately sampled. The proposed methods also did not address the potential that "real-world" catch and release impacts from average sportfishers could be very different from those impacts imposed by experimental "sportfishers".

Other concerns were:

- The proposal did not address whether mortality might vary by timing of the run. It assumes that mortality will be constant over time.
- Agencies impose unique gear requirements at different locations throughout the basin making it difficult if not impossible to extrapolate local results more broadly.
- Water temperature is a key component of stress mortality and will be different from the beginning to the end of the experiment and may vary from year to year. No experimental control for temperature and stress from angling were included in the design.

ProjectID: 35053

Biological Feasibility of Reintroducing Fishwheels in the Columbia River

Sponsor: STEWARD AND ASSOCIATES

FY03 Request: \$236,260 **5YR Estimate:** \$292,770

Short Description: This project will determine whether a fishwheel can be successfully constructed and operated as selective harvest and sampling gear.

ISRP Final Comments:

Not Fundable. Disagree with CBFWA's Recommended Action ranking. As indicated in the preliminary comments and innovative review, the ISRP supports a test of fish wheel feasibility as a selective fishing tool. However, the response was technically inadequate and too many issues remain unresolved for this project to be funded. The literature review would add little to this project's outputs and should instead be part of proposal preparation. The methods response is

inadequate. The limited research design compares sites and day/night fishing, but does not compare fishwheels to other gears. There is no comment on estimating long-term survival of fish intercepted by the wheels. The catchability of the wheels could be estimated by using paired wheels, as conducted by LGL Ltd, but the response contains no comment on this option. The sponsors now recognize but will not address the issues of cooperative gear use and whether acceptable allocation mechanisms for fish wheel harvests can be developed.

Coded Wire Tag Monitoring Program

ProjectID: 198201301

Coded-Wire Tag Recovery Program

Sponsor: PSMFC

FY03 Request: \$2,989,812

5YR Estimate: \$16,132,108

CBFWA Adjusted FY03: \$2,672,053

3YR: \$8,327,359

Short Description: Recovery of CWTs and PIT Tags from salmonids sampled in the commercial/sport fisheries (Col. R and Oregon ocean), spawning grounds and hatcheries. Provides critical stock identification information required to evaluate the status of Columbia Basin stocks.

ISRP Final Comments:

Fundable. Agree with CBFWA's Core Program recommendation, but strongly disagree with reducing the budget by eliminating funding for a statistical position. This position would not be redundant with what is provided by the oversight committees. This position could provide the appropriate focus for a statistical program of this magnitude and could result in cost savings.

The Coded-wire Tag Program is a huge program that annually conducts a large number of activities that are essential to the Basin, and the data provided has been widely utilized over many years. The current proposal requests \$2.99 million from BPA (48.8% of total budget) based on inclusion of the new proposed activities. Matching funds for specific activities in the total program are received from 11 other sources (involving 26 activities)! Given the use and value of the CWT data to regional assessment and monitoring, it is appropriate that BPA funds make a significant contribution to the program. There are a lot of aspects of the CWT program that are of great interest to coastwide harvest management agencies including commitments in the Pacific Salmon Treaty (PST); researchers in fisheries, oceanography, and climate; and for monitoring of hatchery production, stock status and salmon recovery.

In their response to the ISRP, the proponents made a very significant effort to address each of the ISRP's comments. The response clarified the various sources of funding and corrected some values in their presentation. The response recognized the need for integration with project #35033 and stated a commitment to cooperate. Concerning the lack of progress on past recommendations, the program managers explained that they had not proceeded with staffing the statistical position or its technical review due to budget constraints (recent funding guidelines stated "no new tasks and funding increases limited to 3.4% cost of living"). Funding for a statistical position is included in the current proposal. Further, a flow chart to depict the program and costs was included in the response and a detailed table was provided that identified each task and funding source.

Concerning the array of tasks included in the proposal, a regional mark committee determined the rationale for existing tagging and recovery rates, and the tasks currently included in this proposal

were assigned following a NWPPC review (Sept. 1998). Concerning the technical review of the program previously requested by the ISRP, a regional response to RPA 174 has led to a “Comprehensive Marking Strategy Group” and a contract for technical evaluation of the CWT system (funded by BPA according to the response). This work is ongoing but should address many of the previous comments for the ISRP. Associated with any technical work were questions concerning the implementation of mass-marking of hatchery fish and the use of electronic detection of coded-wire tags in these fish. This issue is likely to become an increasingly important aspect of the CWT program and merits more careful evaluation.

Probably the least informative response concerned whether there were “critical bottlenecks or consistent problems in these other programs that limit the success of this program and utility of the data?” The ISRP suggests that the technical review that is currently being undertaken consider the need to establish a timetable of sampling and data needs to ensure that agencies meet these and/or a budget process is established that has flexibility to deal with variations in annual sampling or work needs. Issue of timely catch data is a common concern along the coast.

The remaining questions addressed smaller budget issues. These were adequately explained with the exception of the \$20,000 for sampling SAFE fisheries in the lower Columbia River. The response noted that the predecessor fisheries were sampled at MRP expense and that there is some cooperative nature to the current sampling (note that WDFW and ODFW do pay for this differently). However, the ISRP question concerning whether these fisheries should pay for this sampling did not seem to stimulate a response.

The ISRP wishes to acknowledge the detailed response received. The committee will be interested in the results of the technical review and recommends that following completion a briefing be provided to the ISRP. The latter would ensure that the ISRP is aware of recommended actions or issues to be addressed, etc. If funded, this project should be coordinated with other monitoring projects to ensure compatibility of objectives, common methods and protocols. This coordination could be accomplished under the favorably reviewed CBFWA project #35033.

ProjectID: 198201302

Annual Stock Assessment - Coded Wire Tag Program (ODFW)

Sponsor: ODFW

FY03 Request: \$218,132

5YR Estimate: \$1,157,132

CBFWA Adjusted FY03: \$217,881

3YR: \$673,881

Short Description: Apply coded-wire tags to production releases of coho and chinook salmon at ODFW Columbia Basin hatcheries for stock assessment of hatchery and wild salmon populations. Evaluate survival, contribution and stray rates of hatchery-reared salmon.

ProjectID: 198201304

Annual Stock Assessment - Coded Wire Tag Program (WDFW)

Sponsor: WDFW

FY03 Request: \$334,412

5YR Estimate: \$1,793,273

CBFWA Adjusted FY03: \$319,137

3YR: \$991,312

Short Description: Apply coded-wire tags to production of coho and chinook salmon at WDFW Columbia Basin hatcheries for stock assessment of hatchery and wild populations. Evaluate survival, contribution and stray rates of hatchery reared fish and compare to wild fish.

ProjectID: 198906500

Annual Stock Assessment - CWT (USFWS)

Sponsor: USFWS

FY03 Request: \$119,268

5YR Estimate: \$672,288

Short Description: Apply coded-wire tags to production groups of salmon at federal hatcheries not tagged by other programs. Prepare report on survival trends and distribution of anadromous stocks from 11 federal hatcheries for basin-wide stock assessment.

ISRP Final Comments on CWT Tagging projects 198906500, 198201302, and 198201304:

Fundable for the three proposals (198201302, 198201304, 198906500). Agree with CBFWA (Core Program).

These proposals are tagging components of the Columbia Basin coded-wire tag program (proposal #198201301) submitted by USFWS, WDFW, and ODFW respectively. The program goal for these three proposals is to tag enough coho and chinook salmon from each hatchery to estimate survival and distribution in the ocean, in freshwater fisheries and escapement areas. The proposals would provide continuation of a consistent time series of survival and distribution data to estimate abundance trends of selected hatchery stocks. In addition, the tagged hatchery stocks will be used to provide data relevant to the management of natural stocks, including many that are listed as threatened and endangered under the ESA.

The proposals are intended to create a comprehensive post-release monitoring program for Columbia Basin salmon hatcheries. The projects were initiated to address the problem of incomplete basinwide stock assessment that lacked representative tagging of hatchery production groups. The projects were also established to monitor and evaluate hatchery production in terms of adult returns. Each proposal provides an extensive description of the tagging program and how they related to regional programs and individual projects. The brief history of project performance focuses primarily on funding levels and numbers of fish tagged by each of these agency projects. Objectives and tasks are limited to tagging fish and the recovery of those tags.

The description of tagging methods appears to be adequate, but there is very little to be reviewed from a scientific basis.

Any assessment of the stocks to be tagged should be considered within an overall Basin context and priorities set based on ESU information needs or other specified agency objectives. These tagging programs should be considered with the CBFWA M&E proposal (35033) and overall use of CWT within the Columbia Basin. There may not, however, be any need to change the tagging of the stocks included in these proposals since the overall costs are relatively minor. These costs though could increase substantially if mass-mark selective fisheries impact these stocks. If the stocks that are currently being tagged under these proposals are subject to any mass-mark selective fishery, then there is a need to implement double-index tagging (doubles tagged allocated) as recommended by the Selective Fishery Evaluation Committee of the Pacific Salmon Treaty (See: Selective Fisheries Evaluation Committee. 2002. Investigation of methods to estimate mortalities of unmarked salmon in mark-selective fisheries through the use of double index tag groups. TCSFEC(02)-1. Pacific Salmon Commission, Vancouver, BC., available at www.psc.org/Pubs/sfec02-1.pgf). If these stocks are not included in the double-index tagging, then they must be associated with another DIT stock so that the difference between marked and unmarked mortality can be accounted for.

There are also small issues of differences in budgets that contract managers should review, but the only points for response to the ISRP were:

- 1) Are these tagging programs integrated with Regional tagging plans and how were these stocks selected for inclusion in these proposals?
- 2) Since double-index tagging is not included in these proposals, how is the additional mortality in mass-mark selective fisheries being accounted for?
- 3) An issue not addressed in any proposal is how tagging quality is assessed, and how consistently application standards are being met? For example, how long are tagged groups held to evaluate tag loss before release? Is any effort made to inspect tagging quality (placement of the CWT, quality of fin clip, etc.)?

The two responses reviewed were adequate and specifically addressed each of these three points. The content in the responses was very similar between proposals but each indicated that double-index tagging was included for each indicator stock, and that quality control measures were implemented in each tagging program. The responses could have been strengthened if the frequency of compliance with the quality control measures were reported. The issue of allocation of tags between stocks is addressed by a regional committee and will be re-considered by the Comprehensive Marking Strategy Group.

ProjectID: 35021

Purchase And Evaluation of Automated Marking and Tagging Systems (MATS)

Sponsor: ODFW

FY03 Request: \$843,396 **5YR Estimate:** \$2,564,454

Short Description: ODFW proposes to purchase and further evaluate equipment designed to mass mark hatchery reared juvenile fish. The technology for automated fin marking and/or Coded Wire Tagging has recently been advanced and new equipment is available.

ISRP Final Comments:

Not Fundable, disagree with CBFWA's "Recommended Action" This proposal is technically inadequate. The Oregon Department of Fish and Wildlife (ODFW) proposes to purchase and

further evaluate automated systems for mass marking hatchery reared juvenile salmon and steelhead. The proposal would purchase 3 systems over the next 3 years at an annual cost of nearly \$900,000.

However, the proposal provides no technical background to the mass-marking proposals or past evaluations of mass-marking, not even a description of what it is! There were essentially no methods presented only a short list of tasks. The presentation of this proposal contained much of the material that could have been incorporated into the proposal. For example, the oral presentation made clear that evaluation of the equipment has been adequate to justify incorporating the automated systems into current operations. Fundamentally, this proposal requests BPA to purchase 3 trailer marking systems that would save the State substantial funds each year. Unless there is an error in this simplistic logic, the State should purchase these systems and recover their costs over time.

Conservation Enforcement

ISRP Final Comments on Conservation Enforcement Proposals: 35051, 35052, 200005500, 20005600, and 195505500:

This group of responses addresses the review comments adequately. Responses include justifications of core staff and acknowledgement of how the size of a “core” changes as legal restrictions influence the demand for enforcement and funding changes affect the supply of enforcement. The responses provide thoughtful discussions of the interaction of enforcement and education as well as issues surrounding measuring the effectiveness of each. The enforcement proposals as a group and the responses provided to address ISRP review comments give a good impression of an evaluative approach to the performance of both enforcement and education. There is overlap in the responses of the individual proposals that derives from their coordination. The coordination among these proposals and responses is a positive factor that is likely to lead to collection of integrated data that will be useful for systemwide analysis of enforcement effectiveness.

ProjectID: 200005600

Protect Anadromous Salmonids in the Mainstem Corridor

Sponsor: CRITFE

FY03 Request: \$455,787

5YR Estimate: \$2,518,411

CBFWA Adjusted FY03: \$435,787

3YR: \$1,416,816

Short Description: Protect anadromous salmonids from illegal take throughout the Columbia Basin -- with emphasis on conservation of depleted stocks. CRITFE will concentrate protection in the Zone 6 migration corridor (Bonneville to McNary dams) and focus on adult spawners.

ISRP Final Comments:

Fundable, agree with CBFWA that its fundable - CBFWA “urgent”. This is a well-written proposal to increase the level and effectiveness of enforcement in Zone 6 tribal fishery and tributaries. Its relation to the Fish and Wildlife Program is clear. Objectives, tasks and methods are clearly defined. The proposal takes an evaluative approach to the components of enforcement.

Last year the ISRP recommended that out-year funding be contingent on the provision of more complete information on the magnitude of the illegal harvest problem and the expected benefits to

fish and wildlife from enhanced enforcement. The ISRP also asked for more detail on how efficiency and compliance will be improved and cross-zone enforcement coordinated through this project.

Statistics are provided on the increase in patrol effort enabled by the funding of last year's project. The number of contacts and violations reported both increased. Seizures of illegal gear and fish increased. More detail is also provided on the effectiveness of the enforcement activities in terms of inputs, outputs, and outcomes. Patrol hours, enforcement contacts and arrests all increased between 1999 and 2000. The inclusion of specific monitoring criteria in tasks is very positive.

Law enforcement is an effective tool and component part of the region's effort toward recovery of endangered species, and this proposal seems to demonstrate a potentially successful enforcement program. The incidence of violations appears very low with the current effort. Compliance rate for harvest in Zone 6 appears high, which is laudable.

The response to ISRP concerns was thorough. A good discussion of the various possible definitions of "core" and "effective" is given, although despite the cited difficulty in deriving a single definition the response does in fact present one in the course of the discussion: to maximize the cost-effectiveness of BPA funded projects. A complete staffing analysis is provided. The responses provided more detail on the justification of budgets, indicating that BPA funding is not so much augmenting historic levels as replacing loss.

The ISRP agrees that the conservation enforcement data center has the potential to enhance the system-wide effectiveness and coordination of enforcement as well as to be a public education tool.

The graphs of trends in performance measures are useful. However, some questions about determining optimal levels of enforcement remain: (1) how can we determine how much additional funding is needed, if any, when compliance is already near 100%; (2) what metrics can be used to show cause and effect results; (3) Loss of fall chinook via unaccounted losses over dams has not been resolved because experiments had not been designed to account for all potential sources of mortality (dam loss, harvest, tributary turn off, other sources of mortality).

ProjectID: 200005500

Enhanced Conservation Enforcement for Fish & Wildlife, Watersheds of the Nez Perce

Sponsor: NPT-CE

FY03 Request: \$511,210 **5YR Estimate:** \$2,824,759

Short Description: Increase conservation law enforcement (CE) protection of fish, wildlife, critical habitats and other natural resources within watersheds managed by the Nez Perce Tribe. The CE program will be coordinated with all of the NPT resource enhancement projects.

ISRP Final Comments:

Fundable, agree with CBFWA that its fundable - CBFWA "urgent". This well written proposal is similar to those submitted by the Colville and Umatilla Tribes for increased and enhanced enforcement presence and education to protect threatened and endangered stocks and their habitat. It also takes an evaluative approach to the enforcement problem and builds in continual monitoring, evaluation, and adjustment. Project activities are evaluated in terms of inputs, outputs, and outcomes.

Last year the ISRP asked for a more complete background on the magnitude of the illegal harvest problem. This is provided in the form of identification of species of concern, trends in calls to enforcement and numbers of trespass. Pre and post funding of enhanced enforcement activities are compared in term of numbers of contacts and reports of violations, but with specific note that linking the changes in enforcement effort to biological outcomes will require more evaluation, to be done in subsequent years of the project.

Some of the responses overlap with those of 2000-056-00. For those specific to the Nez Perce proposal: the justification of core staff is adequate. The response acknowledges that public education and outreach plans have fallen victim to budget cuts and subsequent decisions to concentrate resources in enforcement presence, but it does provide an adequate plan for conducting public outreach and monitoring its effectiveness. The response does a good job outlining performance criteria and their associated metrics.

ProjectID: 195505500

Umatilla Tribal Fish & Wildlife Enforcement

Sponsor: CTUIR

FY03 Request: \$178,073 (108,320)

5YR Estimate: \$983,829

CBFWA Adjusted FY03: \$108,320

3YR: \$324,960

Short Description: Increase law enforcement (LE) protection to fish, wildlife, their critical habitats and other essential natural resources within watersheds managed by CTUIR. The program will be coordinated with all other resource enhancement projects of the tribe.

ISRP Final Comments:

Fundable, agree with CBFWA that its fundable - CBFWA “urgent”, but recommend funding 2 FTEs. This response has overlap with other responses. The need for new enforcement officers seems especially acute for the CTUIR, where only .5 FTE is now dedicated for conservation enforcement. In its response, the project sponsor offered to reduce the FTE request from 2 to 1 FTE. However, the ISRP concludes that because a Umatilla conservation enforcement presence is clearly needed the minimum request should be for 2 FTEs. The ISRP recommends against reducing the budget to fund only 1 FTE. Umatilla enforcement will use same performance criteria and metrics as the Nez Perce.

ProjectID: 35052

Conservation Enforcement to Enhance and Restore Fish & Wildlife Resources of the Upper Columbia River under Jurisdiction of the Colville Tribes

Sponsor: CCT

FY03 Request: \$245,636

5YR Estimate: \$1,357,294

CBFWA Adjusted FY03: \$241,221

3YR: \$728,961

Short Description: Protect anadromous salmonids from illegal take throughout the Columbia Basin - with emphasis on conservation of depleted stocks. We will focus fish & critical habitat protection - Chief Joe tailrace, Wells Pool and Okanogan R. fisheries/water diversions.

ISRP Final Comments:

Fundable, agree with CBFWA that its fundable - CBFWA “urgent”. This is a well-written proposal to add enforcement personnel to the Natural Resources Law Enforcement Division of the Colville Tribes. The additional enforcement presence would be directed toward protection of ESA listed stocks and their habitat through training, fishing compliance monitoring, water regulation enforcement, inter-agency coordination and public education. The proposal states that

the project aims not only to increase the level of enforcement in the 3 million acre jurisdiction but also to increase the efficiency of the enforcement through interagency coordination and to increase compliance through greater public awareness of threats to listed stocks.

The potential benefits to fish and wildlife seem high, and the cost reasonable. A strength of the proposal is that it emphasizes expected outcomes throughout all tasks.

An extensive technical background is provided, including a complete description of present and historical Colville Tribal fisheries that includes detail on the nature of the issues facing each fishery and a history of the development of the Tribes' legal authority. Protection needs of critical habitat and water withdrawals are also detailed. The nature of the present enforcement effort is also described in detail.

The description of monitoring as a component of the existing enforcement program is thoughtful and evaluative enough to inspire confidence that an appropriate M&E plan will be developed for the enhanced enforcement program in its first year, as the proposal indicates. The quarterly schedule for producing monitoring and evaluation reports will ensure continual assessment of effectiveness and allow scope for in-season changes.

The rationale and significance to regional programs is clear. Objectives, tasks, and methods are adequately described. The proposed project had strong relationships with other enforcement and recovery projects that are implicit throughout but could be made more explicit in the "relationships to other projects" section.

The response is adequate. The response provides a good justification of enforcement needs, accompanied by maps of the very large enforcement jurisdiction of the Colville Tribes. There is a lot of overlap with the other conservation responses. An enforcement plan is provided.

ProjectID: 35051

Evaluate Feasibility of a System-wide Multi-Agency Fish, Wildlife & Habitat Conservation Enforcement Web-Based Data Center

Sponsor: Steven Vigg & Company

FY03 Request: \$41,347 **5YR Estimate:** \$41,347

Short Description: Develop a Columbia Basin web-based data center - within a GIS framework - to facilitate conservation law enforcement data compilation & analysis and information sharing for enforcement programs, resource managers, and public information & education.

ISRP Final Comments:

Fundable, agree with CBFWA that it is fundable - CBFWA "recommended action." The existence of the web-based data center would probably increase the efficiency of interagency enforcement coordination and would most certainly improve the monitoring and evaluation within and across enforcement programs. The communication link could be valuable and could include an email alerting system. The response does a good job outlining the additional services that would be provided by the Conservation Enforcement Data Center. The description of the data to be collected is adequate. Typical law enforcement data will be enhanced by GPS coordinates, which should greatly increase their utility to monitoring and evaluation. The database could be layered with "at risk" habitat sites.

Hypotheses are presented to test the effectiveness of enforcement activities in reducing illegal take. The project will include in its feasibility assessment an evaluation of alternative approaches

to populate the database once established. The feasibility assessment done by this project has the potential to lead to value-added to systemwide enforcement.

The ISRP suggests that the data center explicitly consider in its feasibility assessment the limitations of the data to be collected, the use of the University of Idaho data to better partition mortality, and mechanisms to provide continuing motivation for enforcement interests to participate in the data center.

Fish and Wildlife Program Coordination, Analysis, and Communication

ProjectID: 199800401

Electronic Fish and Wildlife Newsletter

Sponsor: Intermountain Communications

FY03 Request: \$179,800 **5YR Estimate:** \$993,511

Short Description: Delivers by e-mail (and posted on the web) to policymakers, Basin stakeholders, and general public a weekly electronic newsletter containing objective, timely, summary information about Columbia Basin fish and wildlife issues.

ISRP Final Comments:

Fundable. A comparison with CBFWA is not applicable. CBFWA recommends funding through the Council's budget rather than the FWP. Last year the ISRP noted that although the Columbia Basin Bulletin is widely distributed and respected as a quality product, the proposal to fund the effort was inadequate. This year the proposal corrects those weaknesses by establishing the programmatic need for information to enhance public involvement, coordination of recovery programs, and adaptive management. The proposal presents some summary statistics representing various components of CBB use, as an indicator of demand. Mechanisms of data collection are described, but details about quality control are lacking, as is M&E methodology to assess the impact of CBB. The oral presentation was very informative about quality control, and some of this information should be included in the proposal.

ProjectID: 35026

On-line Subbasin Planning/Watershed Newsletter

Sponsor: Intermountain Communications

FY03 Request: \$115,200 **5YR Estimate:** \$635,903

Short Description: Delivers on-line news, information about Columbia Basin subbasin planning and other locally based fish and wildlife restoration efforts to public and private stakeholders and interested parties.

ISRP Final Comments:

Fundable. Disagree with CBFWA's Recommended Action ranking, should be higher priority. The services to be provided by this newsletter go beyond public outreach activities. This proposal is to extend the approach used in the Columbia Basin Bulletin to subbasin watershed planning. The project will provide an on-line subbasin planning newsletter for the use of agencies, watershed councils, and the public in the 52 subbasins. It will build on the experience of the Columbia Basin Bulletin and share staff and equipment with the Bulletin.

The proposed newsletter, as an information clearinghouse, is clearly relevant to regional programs, and, based on the performance of the Bulletin, is likely to provide a timely, useful communication product that will enhance information transfer and education within and among subbasins. The budget is extremely modest for an effort of this magnitude. By sharing facilities and personnel with the CBB the newsletter would be able to be a cost-effective way to add value to the subbasin planning process.

The oral presentation was informative about methods to be used to monitor and evaluate performance of the newsletter. The proposal would be strengthened by adding a description of these methods.

Suggestions for the newsletter:

- include a calendar of upcoming events or be linked to the NPPC or other regional coordinating calendar
- develop an appendix to the newsletter listing new publications (popular, gray literature and professional publications) on topics that are of interest to subbasin planning.

ProjectID: 199800800

Regional Forum Facilitation Services

Sponsor: NMFS

FY03 Request: \$153,300

5YR Estimate: \$766,500

CBFWA Adjusted FY03: \$101,000

3YR: \$303,000

Short Description: Provide professional facilitation services to enhance communication, assist in conflict resolution, and improve decision-making capabilities among participants in the NMFS Regional Forum Process, which addresses hydropower operations for salmon.

ISRP Final Comments:

Fundable (qualified). Disagree with CBFWA's Core Program ranking. The proposal is to continue to provide facilitation to the Regional Forum and all its teams. As with last year's proposal, the proposal does not establish why such extensive facilitation services are needed, nor does it provide any evaluation of success from past facilitations. The ISRP has made similar review comments for the past three years.

The ISRP did not ask for a response in its preliminary report and, because of the primarily administrative nature of the project, stated an ISRP recommendation was not applicable despite the concerns expressed in the paragraph above. After further discussion the ISRP emphasizes that this proposal continues to be presented without justification or evaluation. The Council should carefully evaluate the performance of this program and investigate the budget to determine whether this activity should not belong under the CBFWA budget. If funded, the sponsor should develop a monitoring and evaluation program during the project selection process. The proposal purports to be building human capital in negotiation skills and meeting skills: how well are they doing?

ProjectID: 199803100

Implement Wy-Kan-Ush-Mi Wa-Kish-Wit Watershed Assessment and Restoration Plan Now

Sponsor: CRITFC

FY03 Request: \$314,093 **5YR Estimate:** \$1,735,562

Short Description: Provide effective and efficient watershed restoration through coordination and support of tribal restoration planning and project implementation consistent with the Wy-Kan-Ush-Mi Wa-Kish-Wit and the NPPC Fish & Wildlife Program.

ISRP Final Comments:

Fundable (qualified); an evaluation plan is needed. Agree with CBFWA's Core Program ranking administratively. This proposal submitted for mid-term review is to continue the coordination of tribal watershed activities. A brief technical background is presented. The project is relevant to several regional programs and tied to other projects. A summary of project achievements to date is presented. Detail is presented on the types of activities conducted by the CRITFC Watershed Department. However, many of the earlier review comments made by the ISRP still apply.

The previous review asked that more detail be provided on activities to be conducted by subcontractors. The response provides more detail on activities and outputs under this project, but is still missing the substantive point of ISRP comments. There are clearly many coordination activities being conducted under this project, but the project still lacks evaluative content. How do the project sponsors decide where activities should be focused, what is most important to do, what outcomes have resulted from the various activities, and which activities are making the greatest difference?

Even with the BPA and NWPPC indirectly establishing required activities through frameworks such as the subbasin process – within which this project operates – limits on time and resources mean that priorities for activities must be set within the project. The project would be improved by taking a more targeted evaluative approach to coordination. New activities should be prioritized to reflect what has been learned about watershed restoration. A plan to monitor and evaluate project effectiveness is needed. How does the project determine whether coordination processes are effective?

One of the project objectives should be to evaluate the effectiveness of the overall program portfolio. The project should set up formal evaluation processes to establish how it is making a difference and if it is achieving its objectives of enhancing the quality of CRITFC input and participation in regional processes. For example, instead of saying “informal feedback indicates readers have found the handbook a valuable resource ...” do a formal follow-up evaluation.

More detail is provided on the budget, but it is hard to determine the appropriateness of line amounts. If funded, a COTR should take a look at it.

The Council should consider whether adequate technical support service for subbasin planning is provided to all 13 tribes in the Basin. In addition to the tribes represented in CRITFC, there are nine other tribes that would benefit from such technical services.

ProjectID: 35056

Develop Human Resources Necessary to Exercise Co-Management Responsibilities

Sponsor: CRITFC

FY03 Request: \$405,024

5YR Estimate: \$2,217,111

Short Description: This proposal will assist the tribes to develop human resources necessary to exercise their co-management responsibilities, effectively manage production facilities and implement ecologically sound artificial production programs.

ISRP Final Comments:

Not fundable, disagree with CBFWA's Recommended Action ranking. This proposal is to coordinate and implement artificial production training programs for members of the Warm Springs, Umatilla, and Nez Perce tribes. The Yakama Nation is submitting a separate proposal for training programs. Training includes community college courses, university courses, short courses and workshops.

The basic tasks of this project are to establish goals and objectives for a training program and to see that students are recruited and the program is implemented. The proposal is brief and does not provide detail as to how these tasks will be accomplished. While the ISRP supports the idea of providing educational opportunities in artificial production to tribal members, we question whether it is necessary to develop custom programs rather than using existing educational programs followed by internships at tribal hatcheries.

The budget is large and does not include explanation of its various components. The project is very heavy with administration costs. For example, the training coordinator is budgeted at more than \$100k. What is the reason for this large a budget? The responsibilities of this person are to be a liaison between tribal education programs, colleges and universities, and CRITFC.

ProjectID: 198906201

Fish and Wildlife Program Implementation

Sponsor: CBFWA

FY03 Request: \$2,217,415

5YR Estimate: \$11,744,354

Short Description: Coordinate fish and wildlife participation in regional mitigation activities in implementation of the FWP, annual project and funding recommendations, rolling provincial review, subbasin planning, program amendment recommendations, etc.

ISRP Final Comments:

Not applicable, not amenable to scientific review.

ProjectID: 35054

Engaging the Public in Watershed Planning; A Tool Box for Cultural Shift

Sponsor: CBFWA

FY03 Request: \$278,391 **5YR Estimate:** \$941,612

Short Description: WATERSHED LEGACY will demonstrate the principles of participatory planning in partnership with Walla Walla and Tualatin communities in developing a set of face-to-face and web-based tools and processes for citizen engagement in watershed planning.

ISRP Final Comments:

Not fundable, disagree with CBFWA's Recommended Action ranking. This proposal seeks funds to develop strategies to increase public participation in watershed planning. It proposes to test the Watershed Legacy approach that it asserts has proven effective in Walla Walla. We agree with the proponent that the subbasin planning process, as it currently stands, is fragile.

While the watershed legacy approach might be successful in facilitating grassroots support required by subbasin planning and to help gain local acceptance of solutions to the decline in fish and wildlife resources, the likelihood of success cannot be determined from the information presented in the proposal. The proposal is inadequate for scientific review. It takes the approach of selling the success of Watershed Legacy rather than evaluating its effectiveness. No explanation is provided about the measures of effectiveness or why further tests are necessary in a different subbasin. Methods to be used to accomplish the tasks are absent. E.g. how is a "needs analysis" done? What does it contain? How are the elements measured?

The claim is made that lack of efficient tools and processes embedded in local organizational and communications infrastructure is the primary problem in watershed planning. However, the tasks and method to develop the tools and databases and to monitor and evaluate the project are underdeveloped. It is not clear that this group has a high probability of success in designing and implementing web-enhanced analytic and communication tools. Success probably depends on the enthusiasm and direct work of the proponent more than the tools they describe. The "bottom-up" collection of disparate datasets is problematic in terms of generating data useful for analysis.

No analysis of present problems or past success is provided. Observation of "control groups" is supposed to provide a test of the strategy's effectiveness, but no details on observational variables or metrics is provided. How is the participatory planning modeled? What are the ecological, economic, and social indicators?

The response did not instill any additional confidence that this project would be beneficial.

ProjectID: 35005

Independent Economic Analysis Board

Sponsor: NPPC

FY03 Request: \$170,000 **5YR Estimate:** \$870,000

Short Description: Analyze the cost effectiveness of fish and wildlife projects as requested by the Northwest Power Planning Council. Help fulfill NW Power Act requirements for cost effectiveness determination of Fish and Wildlife Program and projects

ISRP Final Comments:

The proposal is a reasonable description of the background and context of the IEAB. The IEABs reviews have been of high quality and provide information useful to NPPC decisionmaking.

ProjectID: 199600500

Independent Scientific Advisory Board

Sponsor: CBFWF

FY03 Request: \$681,876 **5YR Estimate:** \$3,649,876

Sponsor Adjusted FY03: \$550,277

Short Description: Provide independent scientific advice and recommendations on issues related to regional fish and wildlife recovery programs under the Northwest Power Act, the Endangered Species Act, and tribal treaties.

ISRP Final Comments:

Not applicable, conflict of interest.

ProjectID: 198907201

Independent Scientific Advisory Board Support

Sponsor: DOE/ORNL

FY03 Request: \$100,027 **5YR Estimate:** \$300,027

Short Description: Provide support through contract with DOE for Dr. Charles Coutant for the Independent Scientific Advisory Board (ISAB), for scientific advice to the NWPPC's FWP, NMFS's ESA program, and the Columbia River Basin Indian Tribes fish and wildlife programs.

ISRP Final Comments:

Not applicable, conflict of interest.

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