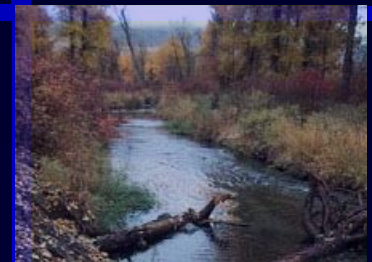


ISRP Retrospective Report: 1997 – 2005

*Dr. Rick Williams
Dr. Nancy Huntly
Dr. Dick Whitney*

*Northwest Planning and
Conservation Council*

*Spokane
September 14, 2005*



ISRP and Peer Review Group (PRG)

- *Independent Scientific Review Panel*

- Peter A. Bisson, Ph.D.
- Charles C. Coutant, Ph.D.
- Daniel Goodman, Ph.D.
- John Epifanio, Ph.D.
- Susan Hanna, Ph.D.
- Nancy Huntly, Ph.D.
- Eric J. Loudenslager, Ph.D.
- William Liss, Ph.D.
- Lyman McDonald, Ph.D.
- Brian Riddell, Ph.D.
- William Smoker, Ph.D.
- Richard R. Whitney, Ph.D.
- Richard Williams, Ph.D.



- *Peer Review Group*

- John D. "Jack" McIntyre, Ph. D.

- *Council Staff*

- Erik Merrill, J.D., NPCC



ISRP Retrospective

- Presents an overview of ISRP activities from 1997 to 2005 and evaluates the cumulative effect of our reviews on program accountability, project effectiveness, and scientific soundness
- Two parts:
 - ISRP review process and results
 - *Lessons from an evolving process*
 - Major programmatic themes
 - *RM&E, mainstem issues, tributary habitat, artificial production, wildlife, ocean and estuary*



Lostine River

Power Act Amendment of 1996

- The 1996 amendment to the 1980 Northwest Power Act:
 - *Formed the Independent Scientific Review Panel (ISRP)*
 - *Formalized peer review in the Fish and Wildlife Program*
- Directs the ISRP to conduct an independent peer review based on a determination that projects:
 - *1. are based on sound science principles;*
 - *2. benefit fish and wildlife;*
 - *3. have a clearly defined objective and outcome*
 - *4. with provisions for monitoring and evaluation of result; and*
 - *5. are consistent with the Council's fish and wildlife program.*

Fish and Wildlife Program Review

- FWP = the “Direct” Program
- Initially, FWP proposals were inadequate for scientific review
 - ISRP, Council, BPA, and CBFWA refined the proposal format and review process
 - Iteratively educational
 - Review Process is
 - *Transparent, and effective*
 - *Provides feedback to Council and to project sponsors*
- Excellent approach to instill scientific review in management decisions
- Could be used as a model in other settings where science and policy intersect



Future FWP Review Processes

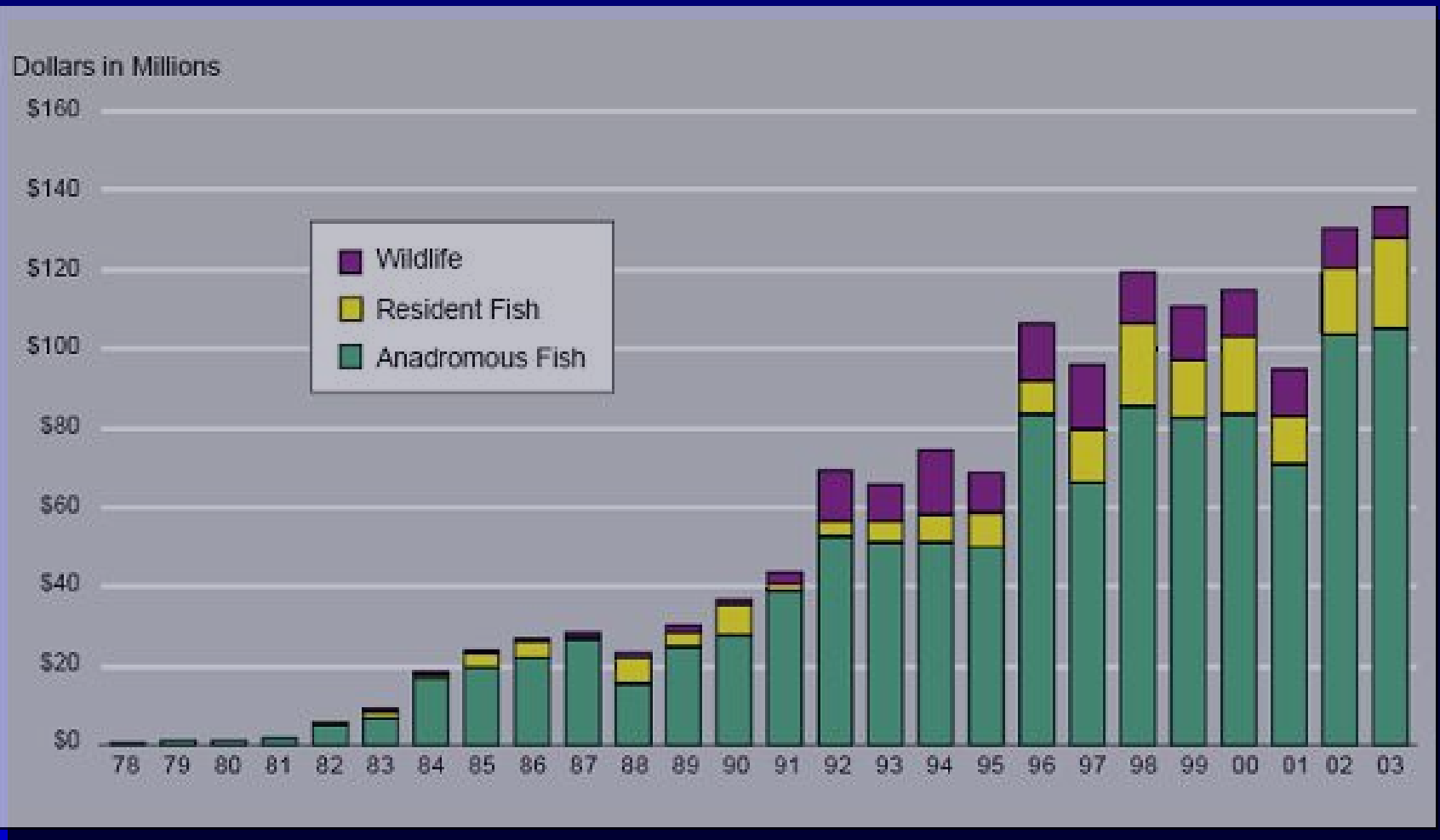
- The ISRP recommends that future processes be modeled after the sequential multi-year provincial reviews, with potential alterations to more efficiently address program needs through topical and targeted reviews
- Benefits of the 2001-2003 provincial review process were manifold
 - *ISRP gained an unprecedented level of understanding of individual projects*
 - *Project sponsors were supportive of the process, which they saw as fair and equitable*



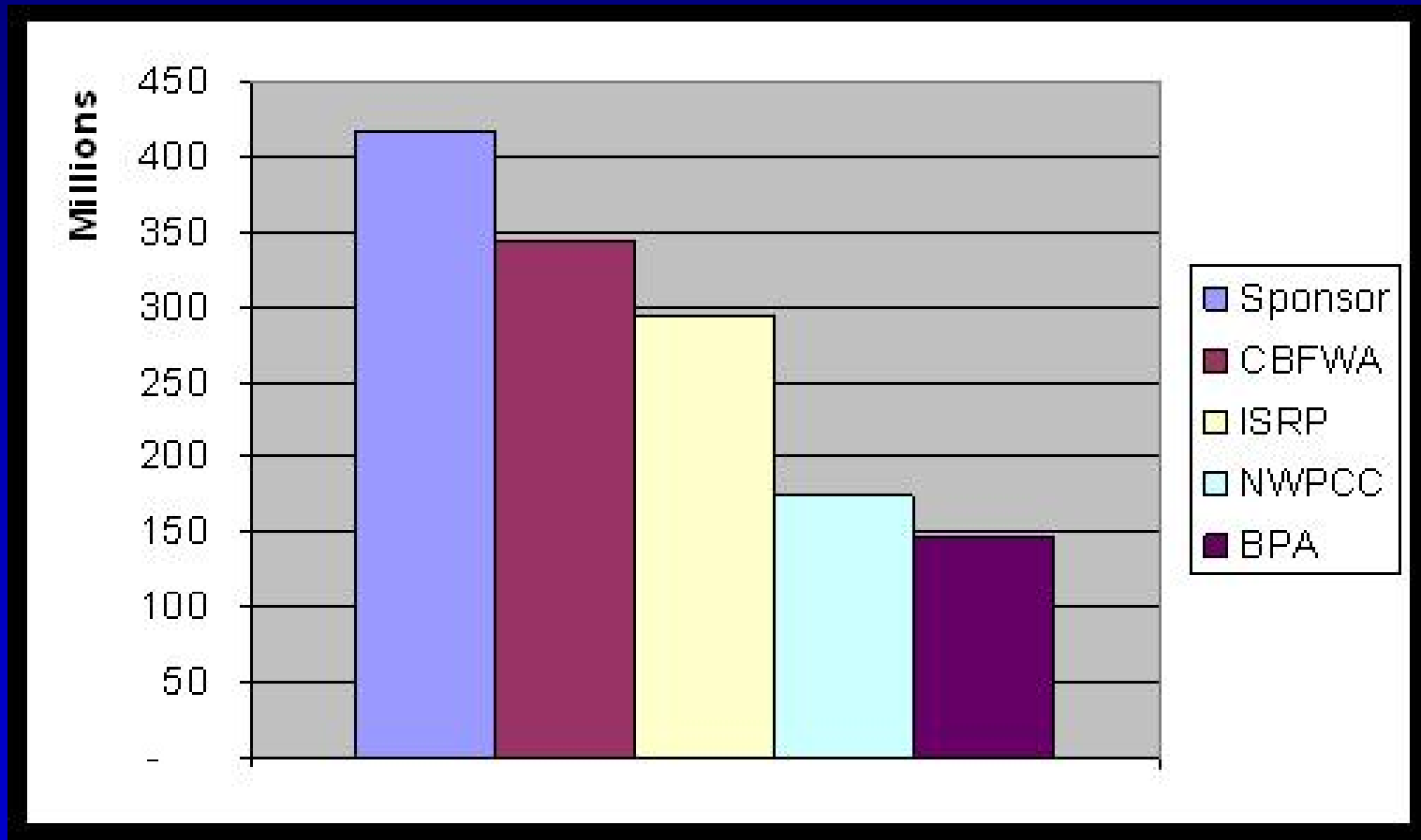
BPA Proposal Review and Contracting

- The proposal review process within BPA is less transparent
- It is unclear to what extent BPA funding decisions remain consistent with the scientific guidance obtained through the Council and ISRP's peer review process
- **Recommendation:** The ISRP recommends that the consistency of BPA funding decisions and contractual Statements of Work with the technical aspects of ISRP-approved proposals be assessed.
 - *PISCES, the new BPA project tracking database, may provide the vehicle to track projects recommended by Council through the contracting and Statement of Work phases.*

BPA Fish and Wildlife Obligations 1978-2003



Funding implications to projects as they move from sponsors request, to CBFWA, Council, and ISRP recommendations and finally to BPA's funding decision.

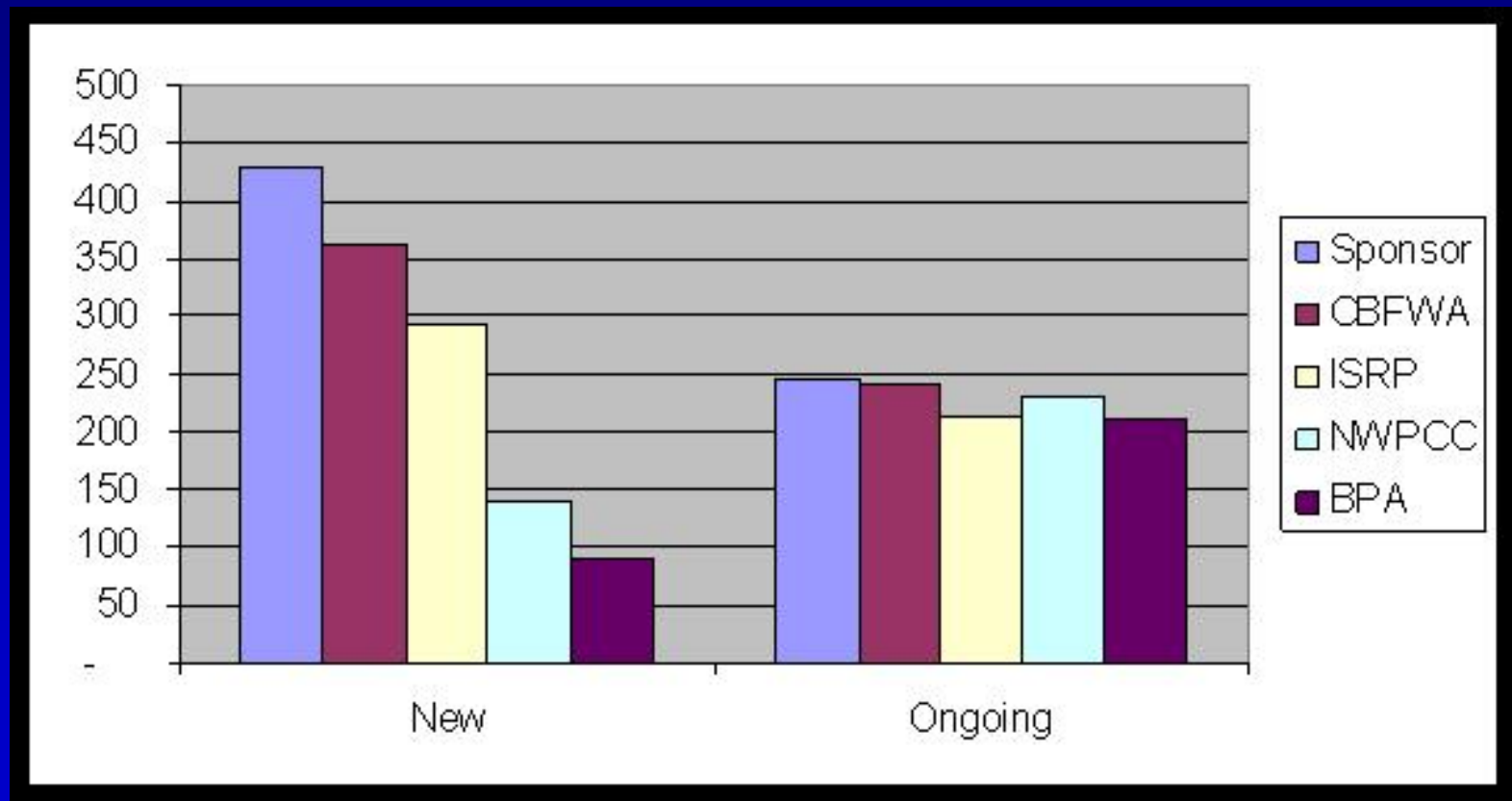


Protecting Investments vs. New Opportunities:

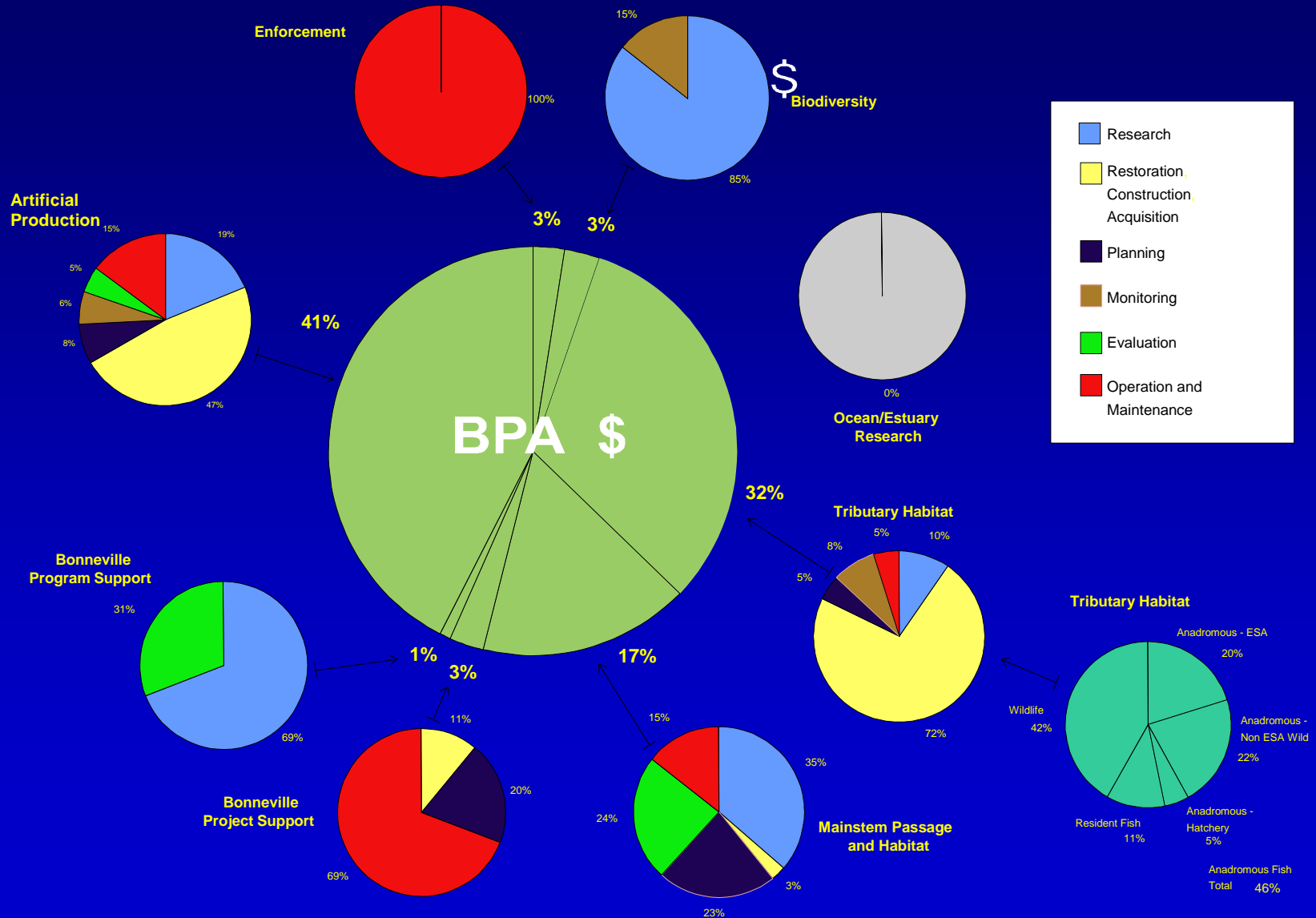
The tension between ongoing and new projects

- New projects compete directly with ongoing projects
 - *Continuing projects (with O&M) dominate FWP*
 - *New projects face a higher hurdle for funding*
- **Recommendation:** The ISRP recommends that alternative review paths be investigated for continuing and new projects
- New projects
 - **Targeted competitive solicitations (RFPs)**
 - *RFPs could (and have) address critical uncertainties in the basin*
 - *ISRP can assist in developing the RFP and reviewing Statement of Qualifications*
 - **Competitive innovative projects**
 - *Important - R & D for basin*
 - *Previous RFPs and Innovative projects have made important contributions*

Tracking the number of new and ongoing provincial review proposals (2001-2003). The graph shows the stability of the ongoing work through the process.



Distribution of funds in the FWP



Reporting of Past Results

- The ISRP recommends that future projects and BPA's tracking database be linked to emphasize reporting of data, biological results, and task completion.
- In addition, projects should be required to report results at specific milestones as a condition for continued funding.



*Fish counting weir on Lake Creek,
Salmon River tributary, Idaho*

Reimbursable Program

Two major components in “reimbursable” program

1) Lower Snake River Compensation Program (LSRCP),
US Fish and Wildlife

- Hatchery mitigation program for salmon and steelhead

2) Anadromous Fish Evaluation Program (AFEP),
US Army Corps of Engineers

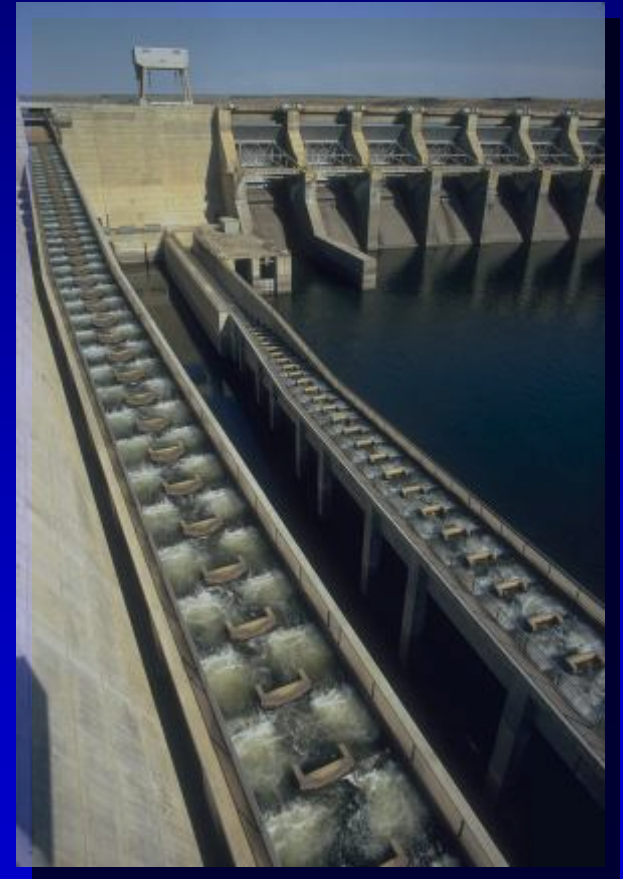
- Program for adult and juvenile passage at mainstem hydroelectric projects, including research, operations, and maintenance

ISRP review of the US Fish and Wildlife's Lower Snake River Compensation Plan was successfully incorporated into the provincial reviews from 2001 - 2003.

US Army Corps of Engineers

Anadromous Fish Evaluation Program

- For the Anadromous Fish Evaluation Program (AFEP) review (US Army Corps of Engineers), the ISRP found the program's current internal process of proposal development did not lend itself to an independent proposal review process.
- **Recommendation:** Before the ISRP conducts another review of AFEP proposals, the ISRP recommends that the Council, Corps, and ISRP identify a clear place for ISRP input into the proposal development process.



Ice Harbor Dam Fish Ladder

US Army Corps of Engineers

Anadromous Fish Evaluation Program

- Presently, the AFE program suffers from a:
 - *Tendency toward “over-engineering”*
 - *Reactionary in nature*
 - *Tendency toward improvisation based on prior year's results*
 - *Fluid and dynamic proposal development process that lacks clear junctures where technical review by ISRP could occur*
- **Recommendation:** The ISRP recommends that the Council and the Corps coordinate project development and funding decisions regarding mainstem issues, wherever possible.
- **Recommendation:** The AFEP would benefit from long-range strategic planning that included design for studies to reveal general principles.

Research, Monitoring, and Evaluation

- ISRP charged to examine whether projects have provisions for monitoring of results, including
 - *Monitoring of task completion*
 - *Monitoring of benefits to fish and wildlife*
- ISRP has written extensively on M&E
- FWP relies on adaptive management for advances in management
 - *Adaptive management requires RM&E*



Stream restoration, Asotin Creek

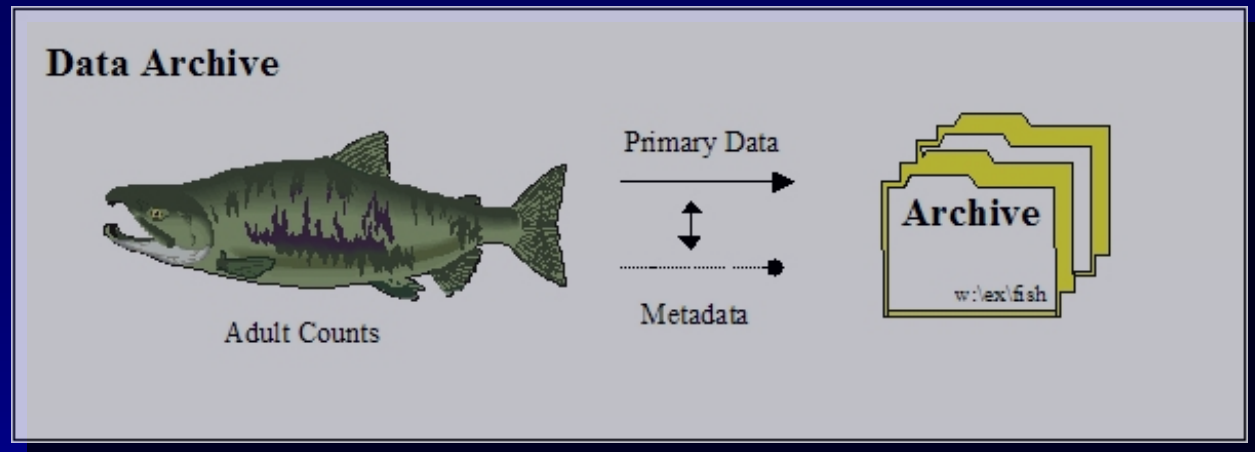
Research, Monitoring, and Evaluation



Steelhead and Chinook trap, Imnaha River, Oregon

- ISRP has worked with projects sponsors since 1997 to provide guidance on M&E needs
 - *Blue Mountain Provincial Report (ISRP 2001-12A)*
 - *Retrospective Report (2005- 14)*
- ISRP has worked from 2003 to present with Action Agencies, CBFWA, and Council staff on developing a coordinated regional RM&E plan

Data Reporting and Archiving



- A recurring concern of the ISRP is the failure of many projects to report
 - *Progress toward project goals*
 - *Primary data and metadata to regional databases*
- ISRP has worked with Action Agencies on developing a coordinated regional RM&E plan
 - *PNAMP – Pacific Northwest Aquatic Monitoring Partnership*
 - *CSMEP – Collaborative Systemwide Monitoring and Evaluation Project*

Tagging Programs



Processing adult fish at Roza Dam, Yakima River. Orange circle for tag detection.

- The ISRP recommends that the Smolt Monitoring, PIT Tag, Radio Telemetry Technology, Coded Wire Tag, and Sonic Tag projects should be subjected to a comprehensive programmatic review that gives special consideration to the complex interactions between the projects.
 - *ISRP has thoroughly reviewed these projects, most recently during the provincial review process.*
- This review is critical because regulations requiring mass marking of hatchery fish and selective fisheries has significant impacts on the results of the projects.

Mainstem Issues



Ice Harbor Dam

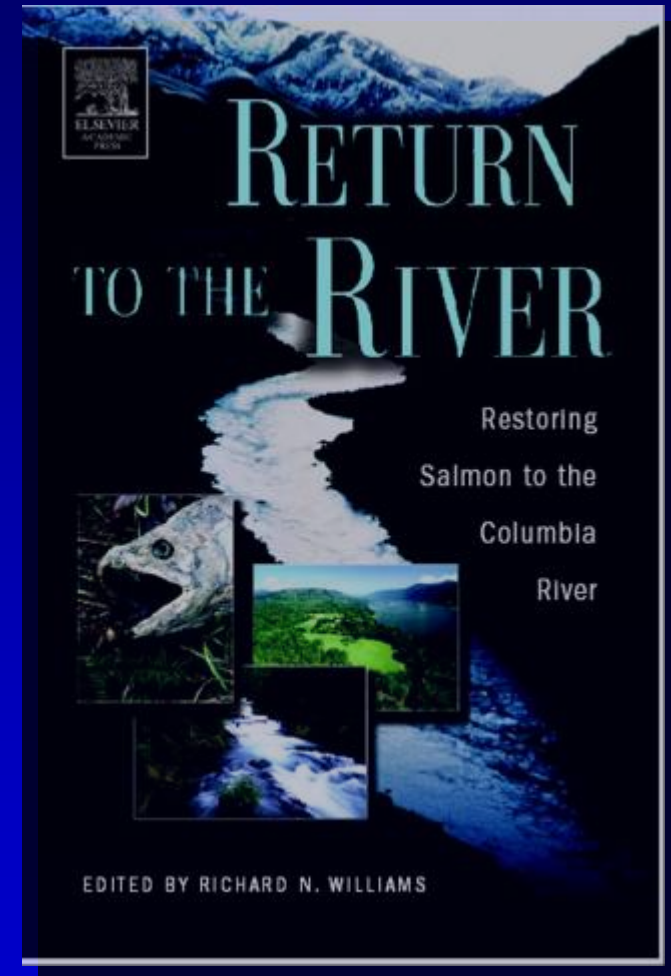
- From the outset of fisheries mitigation research in the basin by the Corps of Engineers in the 1930s and the Northwest Power and Conservation Act's mandated (BPA-funded) Fish and Wildlife Program since 1982, mainstem issues on the Columbia and Snake rivers have held center stage.

Columbia River Basin



Mainstem as Habitat

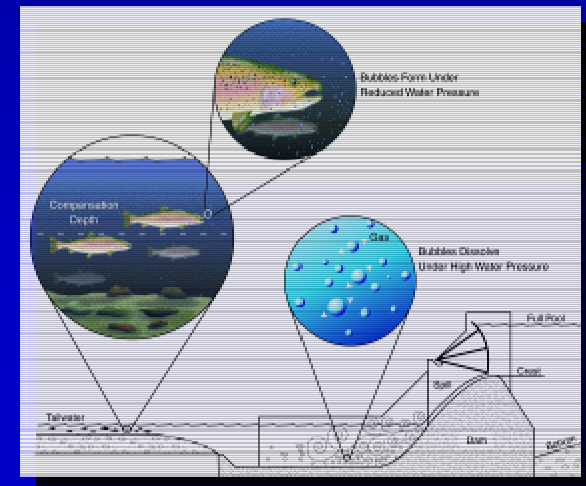
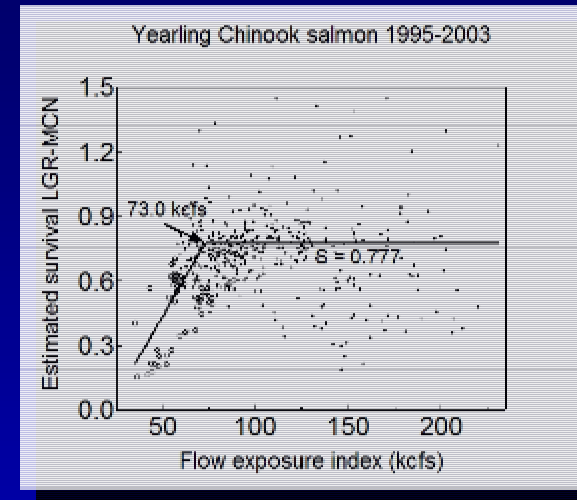
- *Return to the River* (1996, 2005) described the importance of the mainstem as habitat for life history functions, rather than merely as a migration corridor
- Mainstem subbasin plans failed to consider this and concentrated almost exclusively on tributary streams within mainstem section.
- **Recommendation:** Comprehensive mainstem subbasin plans need to be developed.



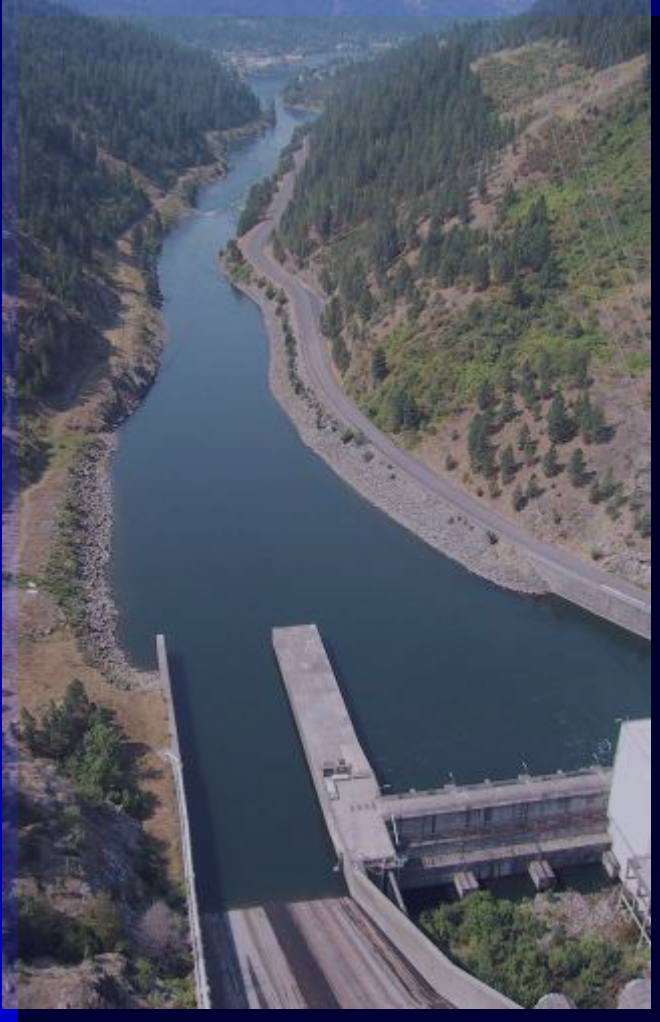
*Release date:
Mid-November 2005*

Persistent Mainstem Issues

- Flow - survival estimates
 - *Relationship between smolt survival and flow levels*
- Smolt survival models
- Gas Bubble Disease
 - *Flip Lips, Gas Cap, and monitoring of gas saturation*
- Mainstem Amendments



Flow Management in the Mainstem



Dworshak Spillway, North Fork Clearwater

An ideal flow regime that gives equal consideration to fish and hydropower has not been established.

- possible exception of flow stabilization measures implemented in the Hanford Reach.

The operation of upstream storage reservoirs and their role in limited flow "augmentation" for fish remain unresolved.

The importance of reservoir hydrodynamics with regard to smolt passage and survival has yet to be fully recognized.

NEED: to study the results of flow management alternatives in a changing climate.

Surface Bypass Technologies

Surface bypass, such as the Removable Spillway Weir, offer increased effectiveness in passing juvenile salmonids with less water than standard spillways.

- Experimental research to evaluate these technologies in laboratory facilities are likely to provide answers much faster and at less cost than in-river trial and error with fully implemented prototypes, a procedure which has dominated recent history.



Rocky Reach Surface Collector being transported prior to installation

Non-salmonids in the Mainstem

- Lamprey
 - *Difficulty using fish ladders*
- Sturgeon
 - *Do not use fish ladders*
 - *Downstream migration of juveniles, but no adult upstream migration*
- Northern Pikeminnow
 - *Appears to be a well-run program that effectively controls predation on juvenile smolts*



*ISRP member Dr. John Epifanio
with sturgeon below Bonneville Dam*

Non-native (Exotic) Species

- Shad
 - *Annual runs of 2-4 million;*
 - *~60% of adult fish returns to basin*
- *Predatory exotics*
 - *Walleye*
 - *Smallmouth Bass*
 - *Largemouth Bass*
- **Recommendation:**
 - *no new exotic freshwater species of any kind should be deliberately introduced anywhere in the basin*
 - *efforts should be initiated to halt expansion of these populations*



Smallmouth Bass - Salmon River, Idaho

Mainstem:

Conclusion and Recommendations

- The ISRP is gratified that most of its recommendations regarding projects in the mainstem have been adopted.
 - *Interchanges among the ISRP, the ISAB, the Council and the Council staff have been very positive.*
 - *A scientifically sound mainstem program is developing that benefits fish, has defined objectives and intended outcomes.*
- Remaining Issues:
 - *Mainstem programs of the Corps (AFEP) and the Council require improved interchange and coordination*
 - *Climate change offers both opportunity and challenge for the mainstem for both fish and other uses*

Tributary Habitat

- Tributary habitat degradation is a major cause of the demise of both resident and anadromous fishes
- Major long-term intervention will be required to restore habitat diversity and connectivity
- Habitat rehabilitation will require action on both public and private lands



Wind River Canyon, Washington

Habitat Rehabilitation



*Middle Fork Salmon, Idaho.
Home to indigenous Chinook, steelhead,
bull trout, and westslope cutthroat trout*

No artificial production in drainage

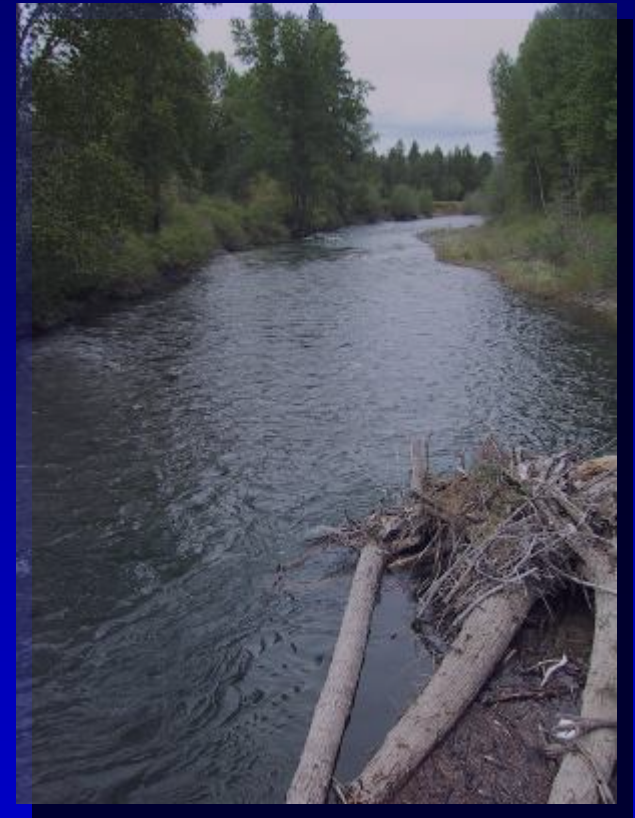
Core or reserve areas that currently contain high quality conditions and maintain strong populations of salmon and trout are of particular ecological importance and should be identified and protected.

Restoration should focus on ecosystem characteristics and processes including watershed features and processes

The role of periodic natural disturbances such as wildfires and floods in maintaining healthy watersheds also should be acknowledged and their benefits protected.

Tributary Habitat and Subbasin Planning

- **Recommendation:** It is the ISRP's understanding and expectation that selection of habitat proposals in the future will be determined in part by their conformity with Subbasin Plans.
 - *This follows logically on the Subbasin Planning effort and will validate the work conducted by hundreds of individuals throughout the Columbia River basin.*
 - *This requisite should make reviews by the ISRP more manageable and transparent, and reward efforts that tie projects to the Subbasin Plans.*



*Teaway Creek,
Yakima Subbasin*

Wildlife

- The Wildlife Program is smaller than the Fisheries Program, has focused on habitat acquisition to replace habitat losses from development of the federal hydrosystem.
- The ISRP has urged the Wildlife program away from a sole emphasis on Habitat Evaluation Procedure (HEP) evaluation and toward more accountability (M&E) for actual wildlife populations.



*Bighorn Sheep,
Middle Fork Salmon, Idaho*

Wildlife Projects in the FWP



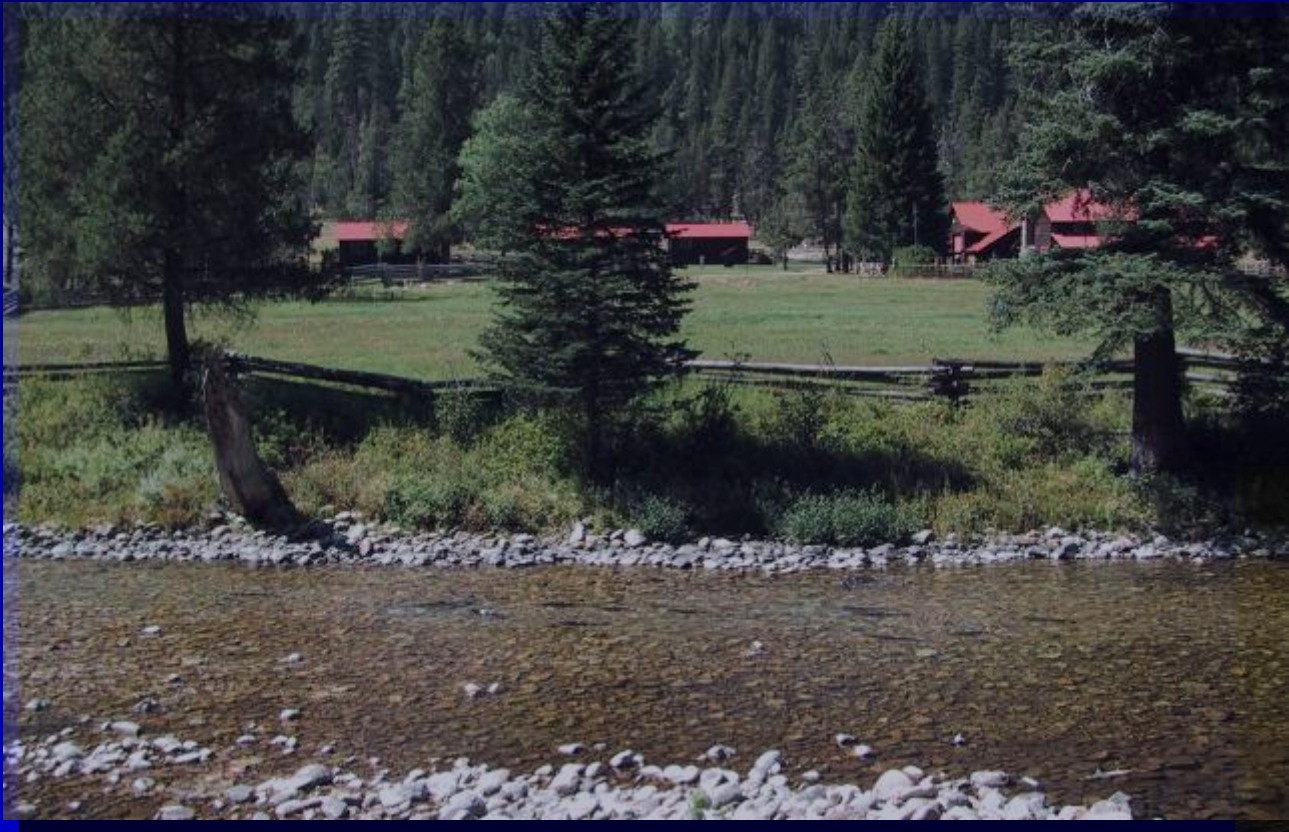
*Beaver cutting,
Pend Oreille Subbasin, Idaho*

- ISRP was critical of the monitoring and evaluation of results in ongoing wildlife projects and of the lack of clear and well-described plans for future monitoring and evaluation
- Many proposals continued to lack clear descriptions of sampling design or of procedures and criteria for assessing the outcomes of management plans

Wildlife and Subbasin Plans

- The Management Plans portion of subbasin plans tended to pay far less attention to wildlife than to fish and often did not include much consideration of landscapes, ecosystems, and overall biodiversity.
- **Recommendation:** There is a critical need to evaluate (and demonstrate, if possible) where and when habitat restoration efforts increase or sustain fish and wildlife populations and at the same time maintain or increase biodiversity.

Artificial Production



*Johnson Creek
Supplementation Project
South Fork Salmon, Idaho*

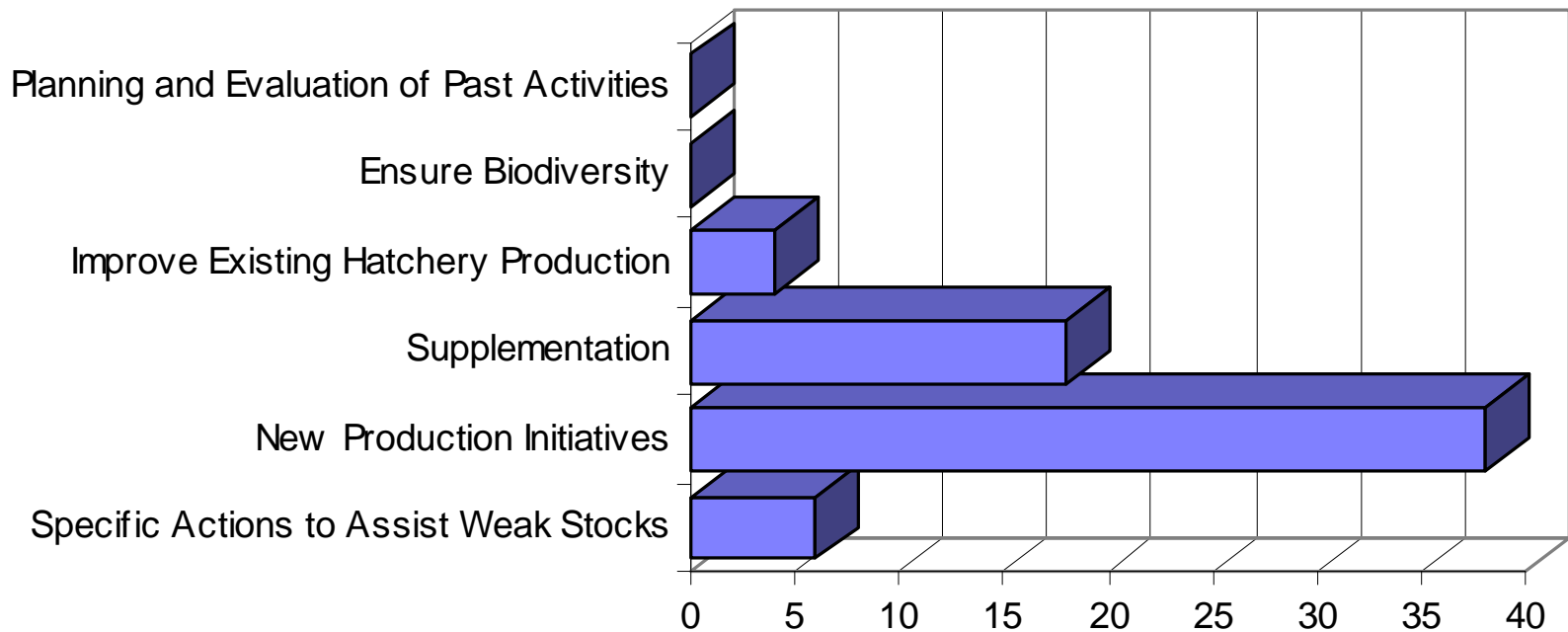
Artificial Production



*Egg incubation trays
US Army Corp file photo*

- Past artificial production activities have contributed to the decline of anadromous salmonids
- Many of the ISRP's recommendations regarding artificial production projects have been implemented
- Reform is underway through the Council's Artificial Production Review and Evaluation (APRE) initiative
- There remain, however, enormous challenges

Distribution of funding projects among the major artificial production measures in the 1994 Fish and Wildlife Program



ISRP Review of Artificial Production Projects

- Over the near decade period of review (1996 to present), the ISRP examined each BPA-funded artificial production project – often multiple times through various review processes – and extensively reviewed the larger, more complex artificial production programs in the basin, such as those in the Yakima, Hood, Klickitat, Grande Ronde, Clearwater, and Salmon river systems.



*Artificial Stream,
Nez Perce Tribal Hatchery,
Clearwater River, Idaho*

Three-Step Process

- In 1997, the ISRP called for a moratorium on funding new artificial production projects, unless project sponsors included adequate risk planning
- Council developed the Three-Step Review process for the design, review, approval, and implementation of new production initiatives.
- The ISRP has produced over 20 Three-Step Reviews resulting in significant changes for several projects.
- **Recommendation:** The ISRP believes the Three-Step Review process has been a successful in-depth project-specific review process which could be applied to other complex core FWP programs.

Artificial Production Recommendations

- Four major recommendations emerge over the ISRP's review history on artificial production.
 - Approach artificial production and supplementation as an experiment that includes defined treatment and appropriate experimental controls, as well as rigorous implementation monitoring and effectiveness evaluation
 - Manage artificial production within a subbasin and habitat context, such as matching releases to subbasin and estuary-marine carrying capacities

Artificial Production Recommendations



*Parkdale Hatchery,
Hood River, Oregon*

- Integrate and coordinate natural and artificial production at various hierarchical levels including the drainage, subbasin, province, and if possible, entire river basin levels
- Recognize the Fish and Wildlife Program's priority on native populations in native habitats, including the need to establishment a system of core natural populations within a framework of healthy habitats

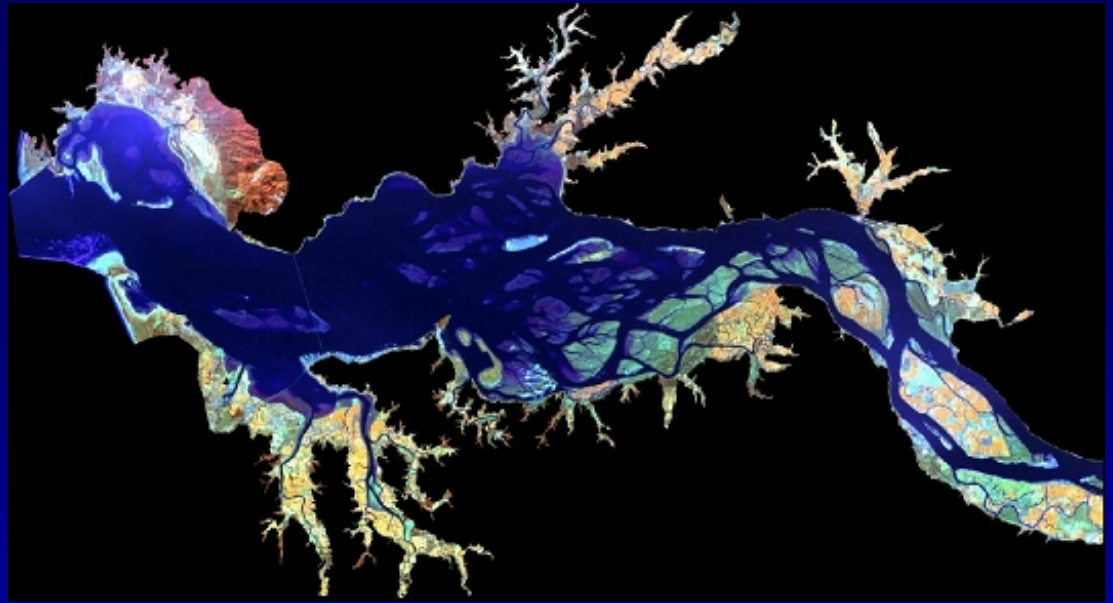
Subbasin Plans and Production

- Almost without exception, the subbasin plans failed to adequately describe artificial and natural production elements within a subbasin and provide a production plan that integrated production with the subbasin's limiting factors
- **Recommendation:** The ISRP recommends that a defensible overall production plan be developed for each subbasin that integrates natural and artificial production elements and explicitly links them to prioritized habitat limiting factors and proposed habitat actions identified in the Subbasin Plan.



*Sorting coho salmon for spawning.
Chiwawa Hatchery,
Wenatchee River, Washington*

Ocean and Estuary



- The region has become more aware of the extent that anadromous fish are affected by changes in the estuary, nearshore, and ocean conditions and the potential negative effects of operation of the hydropower system on those areas.
- The ISRP, ISAB, and other advisory groups have recommended funding of projects to understand the impacts of ocean, estuary, and nearshore conditions on anadromous fish populations and the interaction of human management actions with those environments
- Council has supported funding of these projects

Estuary Recommendations

- **Recommendation:** The ISRP and Council should encourage innovative ecosystem-based research and monitoring in the estuary, with emphasis on the effects of the hydrosystem (altered flows, primarily) on all components of the ecosystem.
- **Recommendation:** A more thorough assessment and increased attention in regional research, monitoring, and evaluation (RME) plans are needed for the mainstem Columbia River between Puget Island (upper estuary) and Bonneville Dam.

Subbasin Planning

- Subbasin Plans (SBP)

- *2-year process*
- *Stakeholder driven*
- *58 Subbasin Plans*
- *~\$10 million*

- 2004 Review of Subbasin Plans

- *11 weeks*
- *26 reviewers*
- *45 plans (30,000+ pages?!)*
- *Countless meetings, hotel rooms, restaurant meals, flights, etc. . .*



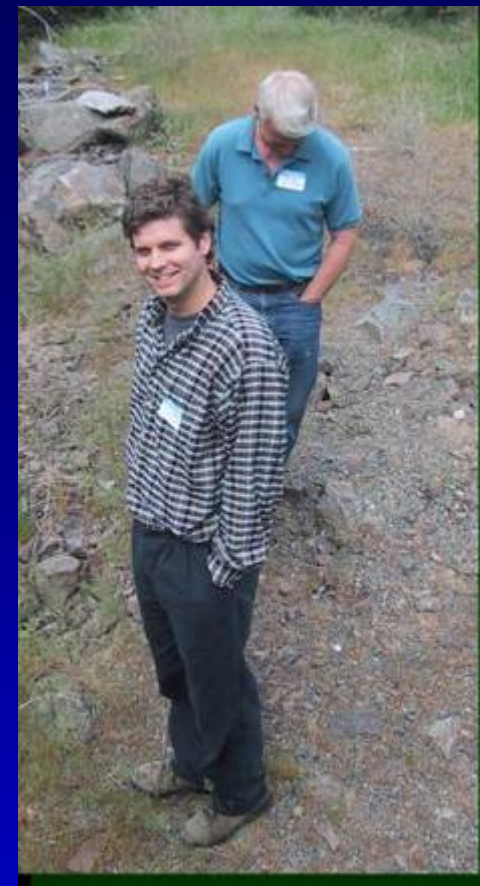
*ISRP listening to subbasin presentations,
Intermountain Province*

Columbia River Basin Subbasins

Print in landscape (sideways) orientation

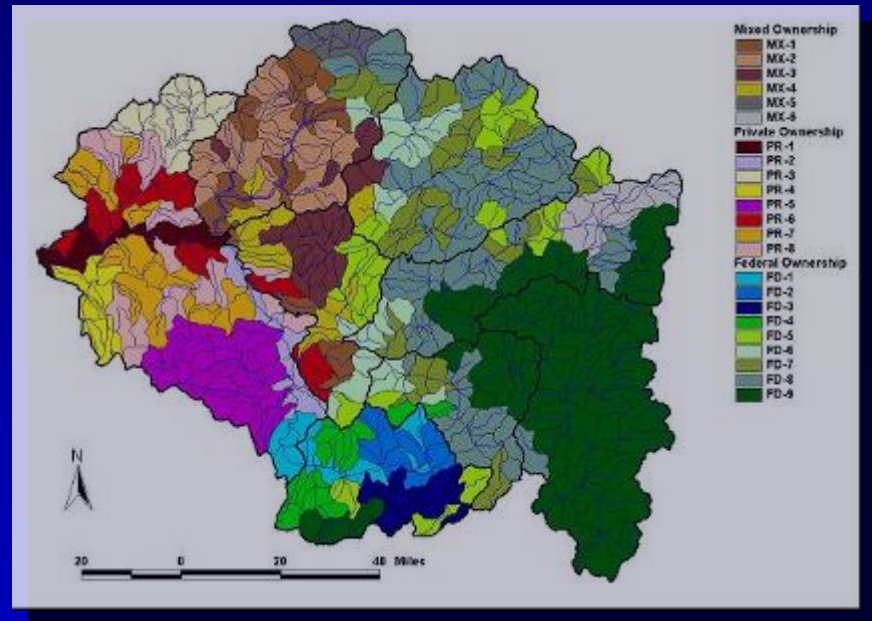


- | | |
|-----------------------|------------------------|
| 1 Astin | 32 Lake Chelan |
| 2 Big White Salmon | 33 Lewis |
| 3 Blackfoot | 34 Little White Salmon |
| 4 Blackfoot | 35 Malheur |
| 5 Boise | 36 Methow |
| 6 Bruneau | 37 Okanogan |
| 7 Bunt | 38 Owyhee |
| 8 Clark Fork | 39 Palouse |
| 9 Clearwater | 40 Payette |
| 10 Coeur D'Alene | 41 Pend Oreille |
| 11 Columbia Estuary | 42 Powder |
| 12 Columbia Gorge | 43 Salmon |
| 13 Columbia Lower | 44 Sandy |
| 14 Columbia Lower Mid | 45 Snpool |
| 15 Columbia Upper | 46 Snake Headwaters |
| 16 Columbia Upper Mid | 47 Snake Helix Canyon |
| 17 Cowitz | 48 Snake Lower |
| 18 Crab | 49 Snake Lower Middle |
| 19 Deschutes | 50 Snake Upper |
| 20 Elchoman | 51 Snake Upper Closed |
| 21 Ermat | 52 Snake Upper Middle |
| 22 Finnerole | 53 Spokane |
| 23 Fliphead | 54 Tucannon |
| 24 Grande Ronde | 55 Umatilla |
| 25 Grays | 56 Walla Walla |
| 26 Hood | 57 Washougal |
| 27 Innaha | 58 Weiser |
| 28 John Day | 59 Waiilatpe |
| 29 Kalama | 60 Willamette |
| 30 Klickitat | 61 Wind |
| 31 Kootenai | 62 Yakima |



Subbasin Plans

- Subbasin Plans are strategic planning documents that plan for near-term, mid-term, and long-term fish and wildlife goals for a subbasin.
- Plans are based on a desired future vision, an assessment of fish, wildlife, and habitat conditions and limiting factors, an inventory of existing work, and a management plan that outlines prioritized strategies to achieve the subbasin's goals and vision.



*Potential Management Units (PMUs)
delineated throughout the Clearwater
subbasin*

- Clearwater Subbasin Assessment

Strengths / Weaknesses of the Plans

The Assessment was the strongest part of most subbasin plans. Many were quite thorough, providing information well beyond that contained in earlier subbasin plans and summaries.

- *Substantial information about the subbasin's physical environment and biological resources was described.*

Thoroughness of the Assessment set the stage – through the limiting factors analyses – to prioritize proposed implementation objectives and strategies in the Management Plan, i.e., the ultimate goal of the process.

- *However, a significant portion of the subbasin plans failed identify a set of prioritized actions linked explicitly to limiting factors identified in the Assessment.*

Management and Fisheries Goals

- The ISRP notes (p. 58, Retro)
 - *“Management will need to find a way to take into account the spawning escapement and fishing goals specified in [some of] the subbasin plans.”*
- If such an accommodation does not take place, the subbasin plans will be meaningless. Even disregarding whether the salmon numbers are specified or not, habitat improvement will not be effective unless fisheries managers regulate the fisheries to assure that adequate numbers of spawners reach the habitat.

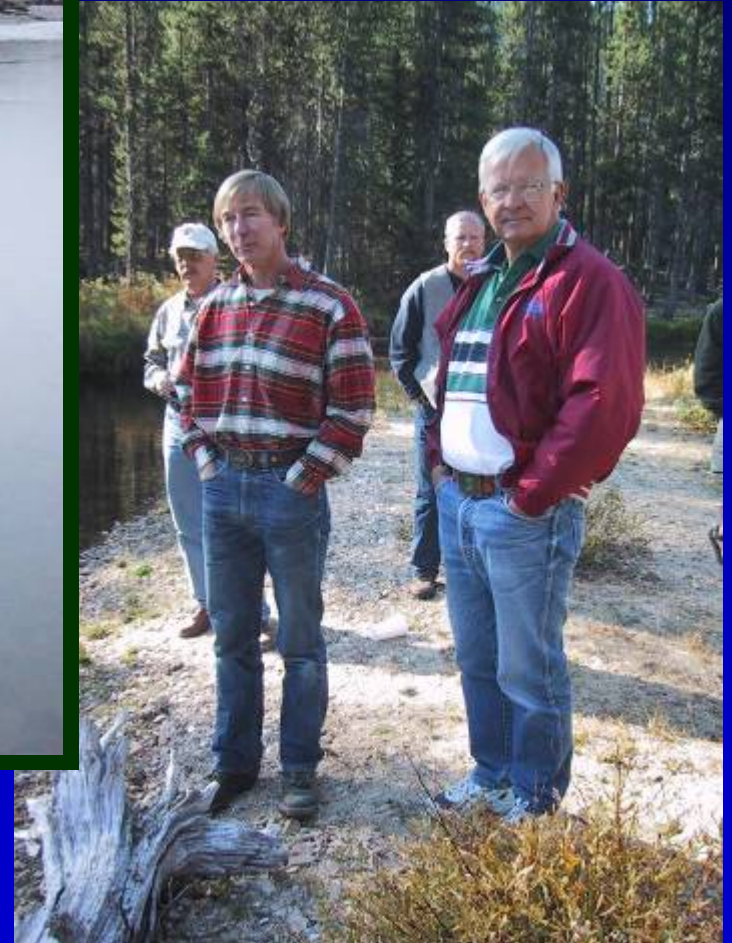


*Angler with wild spring Chinook,
South Fork Salmon, Idaho*

The ISRP Legacy: Building from the Past into the Future



*Dr. Jack McIntyre, PRG member
Middle Fork Salmon Site Visit*



*Dr. Eric Loudenslager, Chair, ISAB
Wenatchee Subbasin Tour*