Independent Scientific Advisory Board
for the Northwest Power and Conservation Council,
Columbia River Basin Indian Tribes,
and National Marine Fisheries Service
851 SW 6th Avenue, Suite 1100
Portland, Oregon 97204
ISAB@nwcouncil.org

Report Presentation: Review of the 2009 Fish and Wildlife Program

A primary responsibility of the Independent Scientific Advisory Board (ISAB) is to evaluate the Northwest Power and Conservation Council's Columbia River Basin Fish and Wildlife Program (Program) on its scientific merits in time to inform amendments to the Program and before the Council requests recommendations from the region. The soon to be released report will contain the ISAB's scientific evaluation of the 2009 Program and is intended to help guide the region as it develops recommendations and the Council as it frames the amended Program.

ISAB Chair Rich Alldredge, Vice-chair Chris Wood, and member Greg Ruggerone will present findings from the ISAB's report.

The ISAB's report is scheduled for release and posting to the ISAB's web page (www.nwcouncil.org/fw/isab) by March 8, 2013.

ISAB Review of the 2009 Fish and Wildlife Program

March 13, 2013
Portland, OR

Independent Scientific Advisory Board
for the Northwest Power and Conservation Council,
Columbia River Basin Indian Tribes,
and National Marine Fisheries Service
851 SW 6th Avenue, Suite 1100
Portland, Oregon 97204

Acknowledgements

- ISAB Ex Officios

  Michael Ford, Ph.D., Director of the Conservation Biology Program at the Northwest Fisheries Science Center

  Phil Roger, Ph.D., Fisheries Science Manager at the Columbia River Inter-Tribal Fish Commission

  James Ruff, M.S., P.H., Manager, Mainstem Passage and River Operations, Northwest Power and Conservation Council

- Coordinators and Staff

  Erik Merrill, J.D., Independent Science Program Manager, Northwest Power and Conservation Council

  Laura Robinson, Program Implementation and Liaison Specialist, Northwest Power and Conservation Council

- Many Others

Assignment

- Evaluation of the scientific merits of the Fish and Wildlife Program is a primary responsibility of the ISAB.
- The evaluation should occur in time to inform amendments to the Program and before the Council requests recommendations from the region.
- This ISAB report is intended to help guide the region in developing recommendations and the Council in framing the amended Program.

The Review Process

- Past ISAB and ISRP reports informed the 2009 Program. This review was informed by more recent ISAB and ISRP reports.

- Briefings by the NPCC staff, the HSRG, BPA and NOAA fisheries and ISAB attendance at CRITFC's Future of Our Salmon Conference were very useful.

General Comments

- The 2009 Program has been a useful framework for context of complex Columbia River Basin issues.
- Content and approach of this review were shaped by the time available.
- Focus is on scientific concepts, language, and to lesser extent implementation.
- Opportunity to look ahead (are we heading toward success?) and back (what have we learned?)

Sustainability as a Foundation

- Sustainability - *likelihood that system of resource use will persist indefinitely without a decline in the social welfare it delivers*; resilience + adaptability
- Resilience – *the capacity of a system to absorb disturbance and still retain its basic function and structure* (*i.e., not shift into a new state)*
- Adaptability – *the capacity of actors in a system to manage resilience (by avoiding undesirable states, or shifting the system into more desirable states).*

Scientific Principles

1. Abundance, productivity, diversity, and spatial distribution are sustained by complex and adaptive ecosystems.

2. Biological diversity allows ecosystems to persist in the face of environmental variability.

3. Human health and well-being are tied to ecosystem conditions.

Cost of maintaining redundancy and diversity must be weighed against long-term benefits of resilience

Scientific Principles

4. Biological and cultural diversity provide the raw material for adaptability during transitions to new ecosystem regimes.

5. Ecosystem management is adaptive and experimental.

6. Socioeconomic engagement is needed to make management actions sustainable.

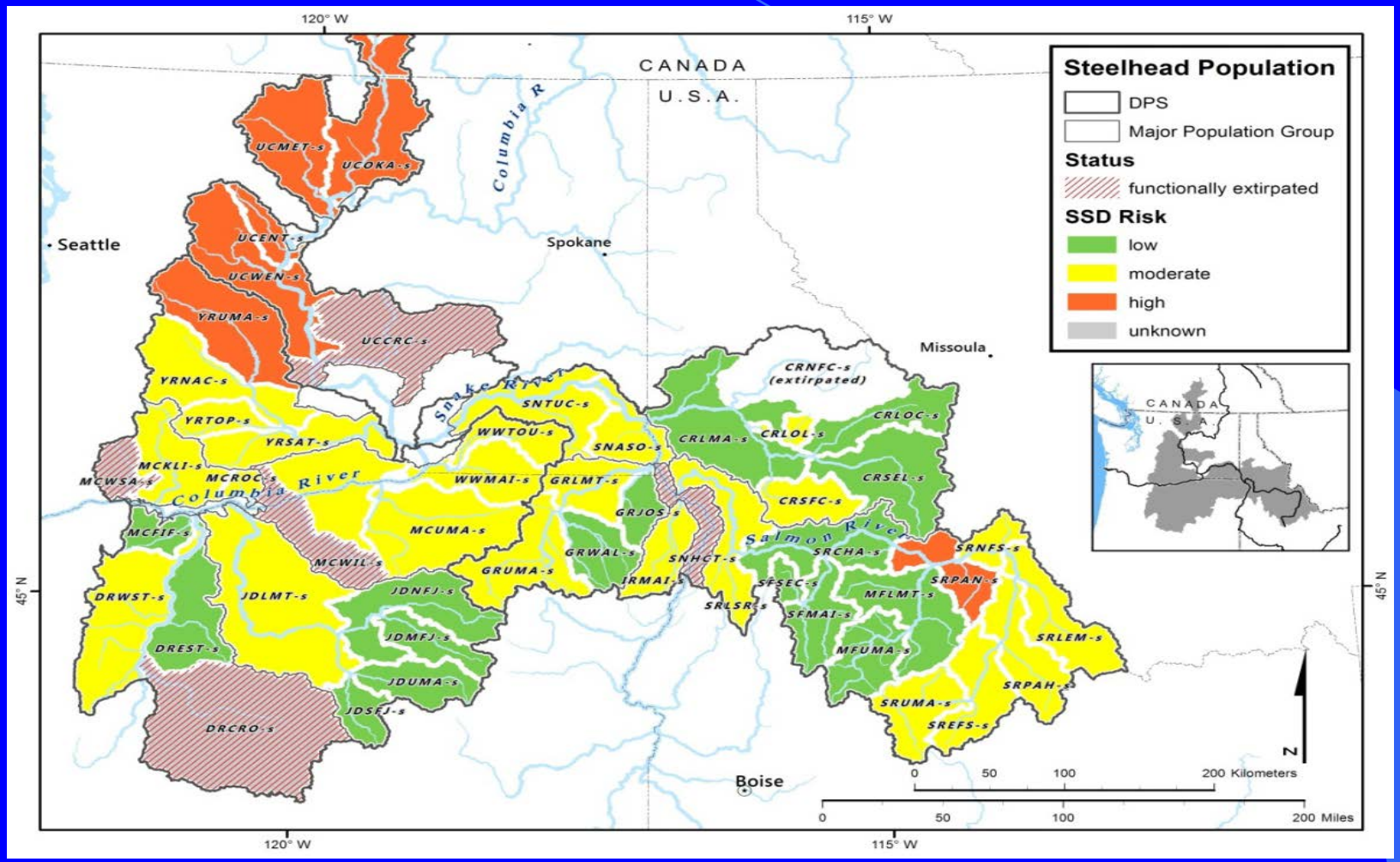
General Recommendations

- Loss of biological diversity
- Climate change
- Chemicals and contaminants
- Non-native species
- Uncertainty about carrying capacity
- Artificial production
- Harvest

Recommendations: Biological Diversity

- Develop High Level Indicators for population diversity across recovery units.
- Implement a program to monitor biological diversity at the scale of the entire basin.

Spatial Structure/Diversity Example



Recommendations: Climate Change

- Examine management options such as flood control and hydropower operations to enhance sustainability under climate change.
- Require project proposals and management plans to consider the impact of climate change on outcomes.

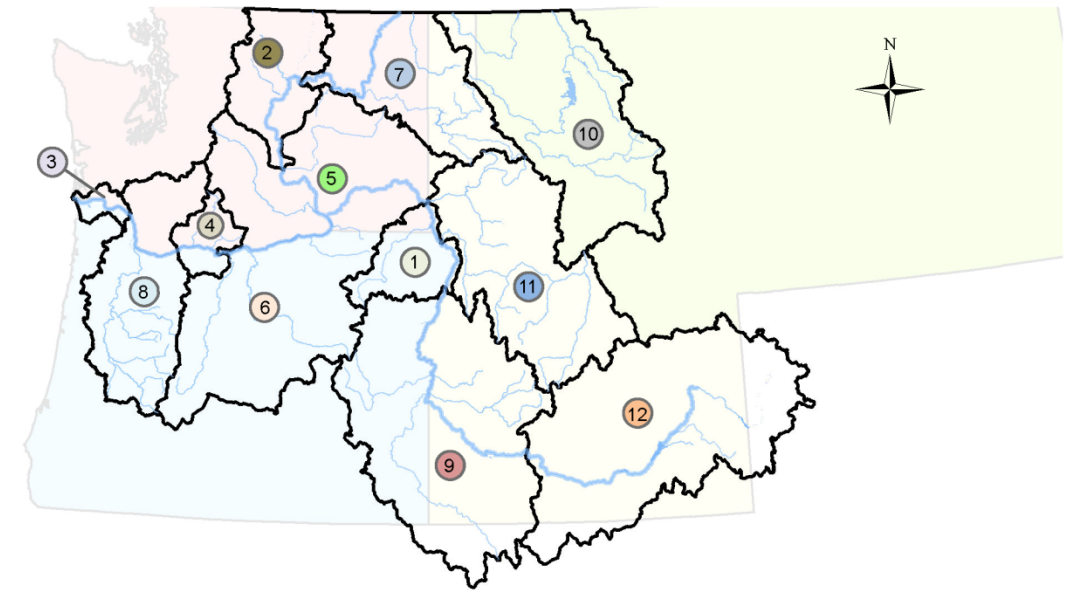
Recommendations: Chemicals and Contaminants

- Investigate the impact of chemicals on restoration activities.
- Work with regional agencies on the interagency Columbia River Basin Toxics Reduction Action Plan.

Recommendations: Non-native Species and Predators

- Develop well-reasoned policies including a process to prevent introductions and monitoring of non-native species status.
- Promote research on changes in predation due to non-native species and conditions created by the hydrosystem.
- Develop methods for addressing public views of non-native species and predators.

Species	Number	Native / Non-native	Agency / Tribe	FWP Funded
BLUE MOUNTAIN (1)				
Rainbow Trout	175,139	N/NN	State	
COLUMBIA CASCADE (2)				
Brook Trout	537,402	NN	State	
Brown Trout	365,230	NN	State	
Cutthroat Trout	367,830	N/NN	State	
Kokanee	38,700	N/NN	State	
Rainbow Trout	1,136,189	N/NN	State	
Tiger Trout	22,500	NN	State	
COLUMBIA ESTUARY (3)				
Rainbow Trout	3,096	N/NN	State	
COLUMBIA GORGE (4)				
Brook Trout	30,756	NN	State	
Brown Trout	13,972	NN	State	
Cutthroat Trout	17,870	N	State	
Rainbow Trout	161,452	N/NN	State	
COLUMBIA PLATEAU - NORTH (5)				
Brook Trout	9,083	NN	State	
Brown Trout	147,677	NN	State	
Cutthroat Trout	273,774	N	State	
Golden Trout	4,512	NN	State	
Kokanee	703,767	NN	State	
Rainbow Trout	2,428,342	N/NN	State	
Tiger Muskie	300	NN	State	
Tiger Trout	26,151	NN	State	
COLUMBIA PLATEAU - SOUTH (6)				
Bluegill	325	NN	State	
Brook Trout	94,747	NN	State	
Brown Trout	39,047	NN	State	
Cutthroat Trout	62,084	N	State	
Kokanee	182,443	N	State	
Largemouth Bass	800	NN	State	
Rainbow Trout	648,673	N/NN	State	
INTERMOUNTAIN (7)				
Arctic Grayling	3,700	NN	State	
Brook Trout	177,833	NN	State/Tribe	Part
Brown Trout	212,050	NN	State	
Channel Catfish	11,552	NN	State	
Cutthroat Trout	428,696	N/NN	State	
Golden Trout	2,100	NN	State	
Kokanee	1,262,684	N	State/Tribe	Part
Rainbow Trout	3,034,217	N/NN	State/Tribe	Part
Tiger Muskie	1,450	NN	State	
Tiger Trout	75,000	NN	State	
Walleye	20,000	NN	State	
White Sturgeon	3,990	N	State	Yes
LOWER COLUMBIA (8)				
Bluegill	100	NN	State	
Brook Trout	89,547	NN	State	
Brown Trout	67,575	NN	State	
Channel Catfish	3,755	NN	State	
Cutthroat Trout	83,356	N	State	
Kokanee	311,743	NN	State	
Largemouth Bass	325	NN	State	
Rainbow Trout	2,259,251	N/NN	State	
Tiger Muskie	3,050	NN	State	

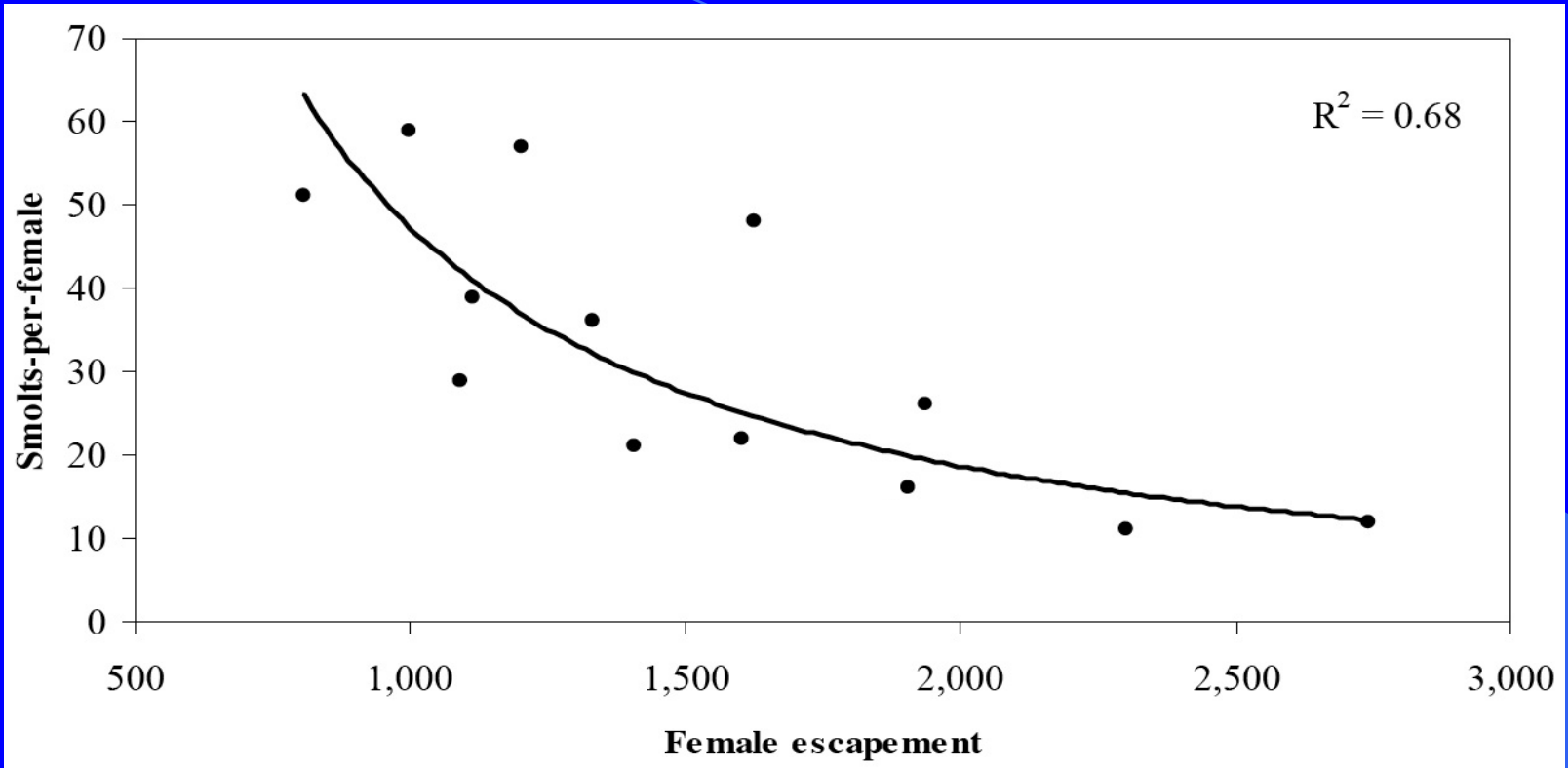


Species	Number	Native / Non-native	Agency / Tribe	FWP Funded
MIDDLE SNAKE (9)				
Arctic Grayling	11,471	NN	State	
Black Crappie	51	NN	State	
Bluegill	2,951	NN	State	
Brown Trout	52,425	NN	State	
Channel Catfish	12,460	NN	State	
Cutthroat Trout	91,891	N/NN	State	
Golden Trout	21,979	NN	State	
Kokanee	838,023	NN	State	
Largemouth Bass	655	NN	State	
Rainbow Trout	2,499,402	N/NN	State	
Smallmouth Bass	849	NN	State	
Tiger Trout	1,600	NN	State	
MOUNTAIN COLUMBIA (10)				
Arctic Grayling	135,000	N	State	
Brook Trout	58,643	NN	State	
Brown Trout	5,002	NN	State	
Channel Catfish	8,663	NN	State	
Golden Trout	1,800	NN	State	
Kokanee	11,856,694	NN	State	
Largemouth Bass	95,700	NN	State	
Rainbow Trout	939,058	N/NN	State/Federal	Part
Rainbow Trout x Westslope	36,000	NN	State	
Smallmouth Bass	31,500	NN	State	
Westslope Cutthroat Trout	355,353	N	State/Federal	Part
White Sturgeon	14,000	N	Tribe	Yes

Species	Number	Native / Non-native	Agency / Tribe	FWP Funded
MOUNTAIN SNAKE (11)				
Arctic Grayling	4,544	NN	State	
Channel Catfish	4,177	NN	State	
Cutthroat Trout	135,318	N/NN	State	
Golden Trout	11,420	NN	State	
Rainbow Trout	651,318	N/NN	Tribe	Yes
UPPER SNAKE (12)				
Arctic Grayling	7003	NN	State	
Brook Trout	100,007	NN	State	
Brown Trout	40,793	NN	State	
Channel Catfish	42,993	NN	State	
Cutthroat Trout	1,353,659	N/NN	State	
Golden Trout	1,507	NN	State	
Kokanee	224,387	NN	State	
Rainbow Trout	2,946,302	N/NN	State	
RainbowTrout x Cutthroat Trout	221,419	NN	State	
Walleye	1,050,000	NN	State	

Data source and graphic: Neil Ward and Binh Quan, Columbia Basin Fish and Wildlife Foundation

Recommendations: Carrying Capacity



1. Address carrying capacity for juvenile salmonids when integrating and prioritizing plans for artificial propagation and habitat restoration, e.g. Umatilla steelhead.

2. Conduct empirical investigations and develop bioenergetic models to estimate trophic demands on food supplies by native and non-native competitors of juvenile salmonids, e.g., 166 mt consumed by yearling Chinook passing Lower Granite Dam

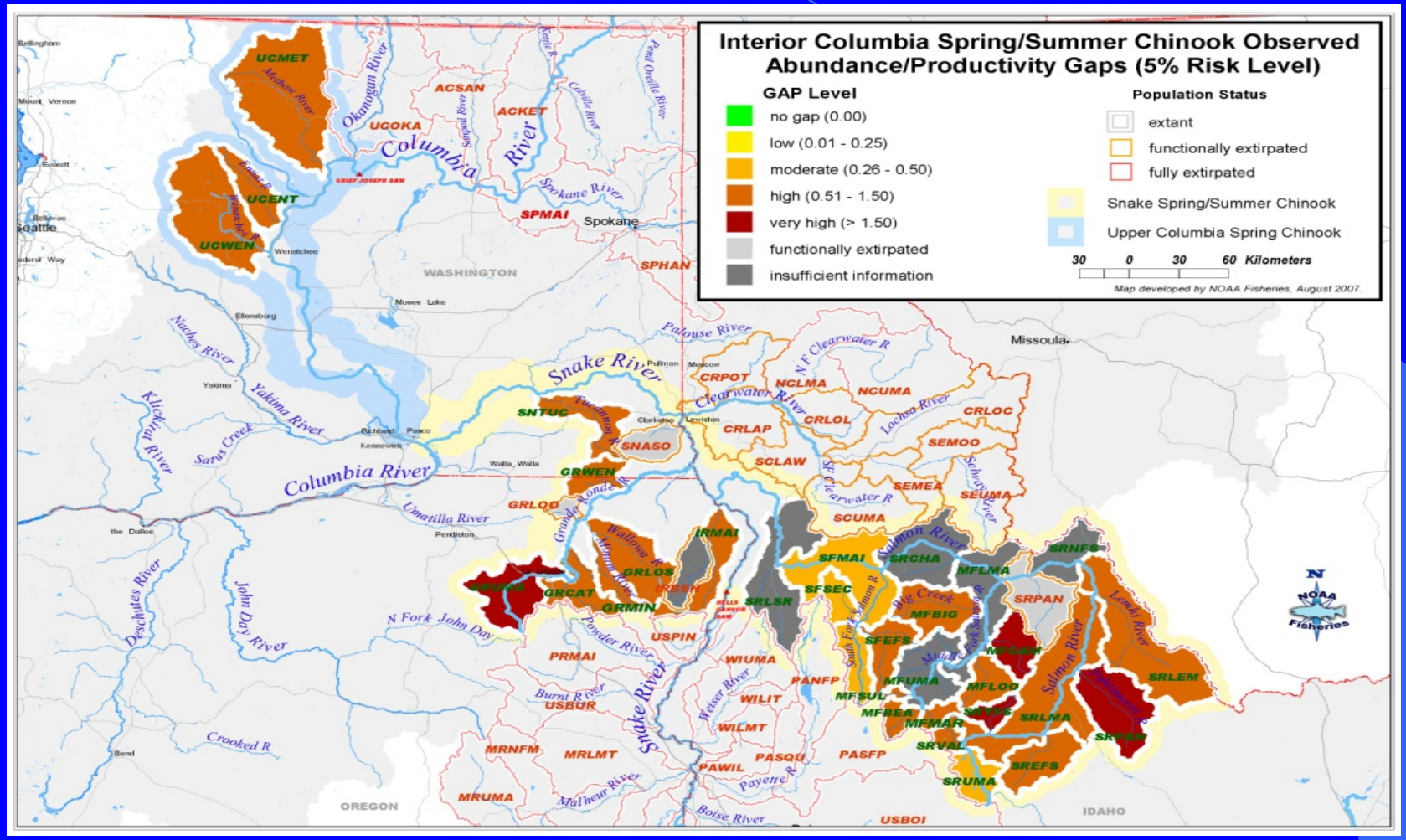
Recommendations: Artificial Production

- Can recovering ESA-listed species, establishing healthy natural populations, and mitigating harvest using artificial production be reconciled?
- Develop quantitative objectives for each artificial production program, e.g., harvest targets.
- Treat integrated supplementation and harvest as distinct programs.

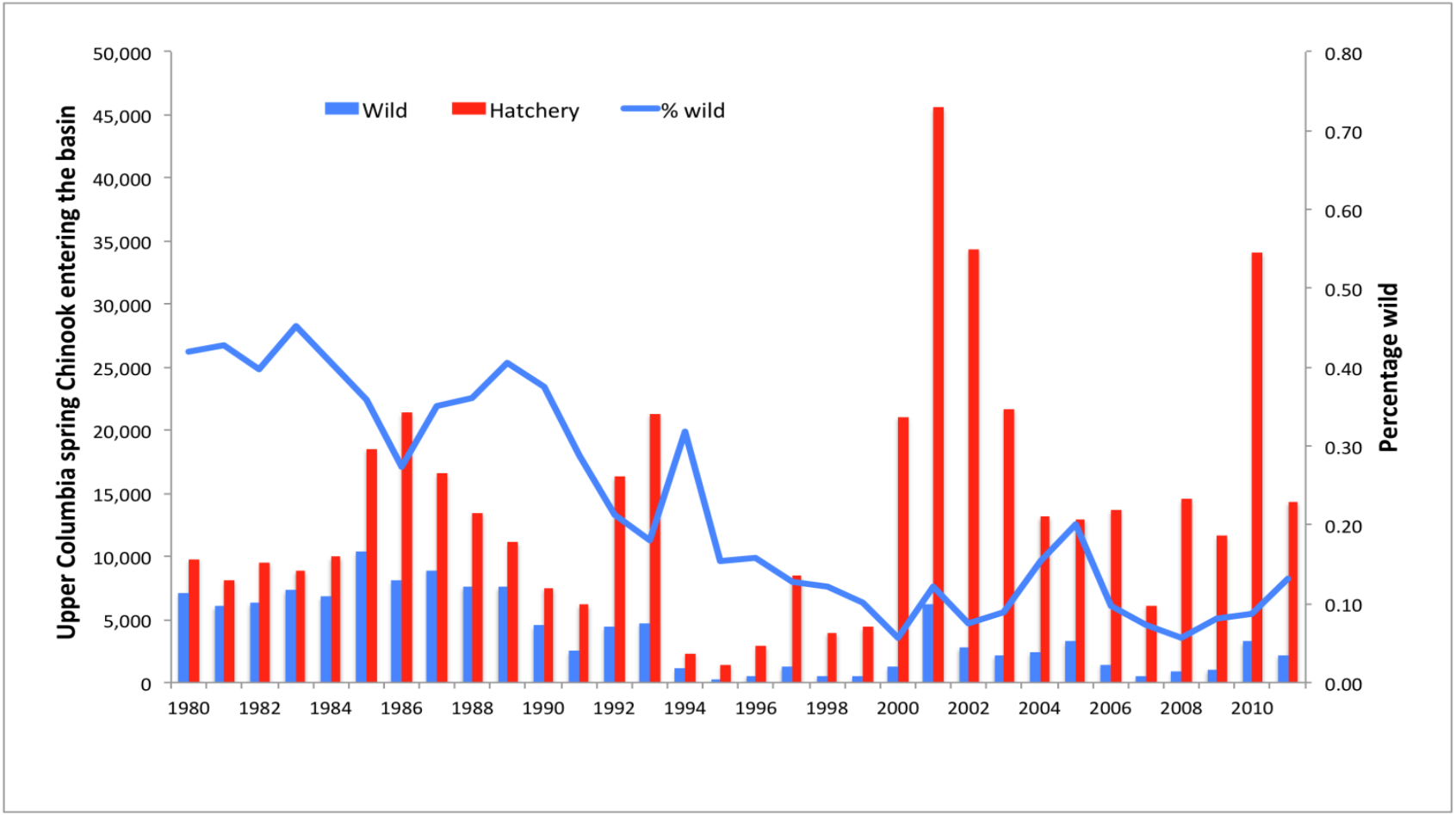
Recommendations: Harvest

- Assess the extent to which harvest slows recovery of naturally-reproducing populations.
- Address ecosystem-scale effects of harvest and potential fisheries-induced evolution.
- Improve the monitoring of hatchery and natural-origin fish in harvest and on spawning grounds.

Low and variable Chinook productivity- Harvest & Hatchery Implications

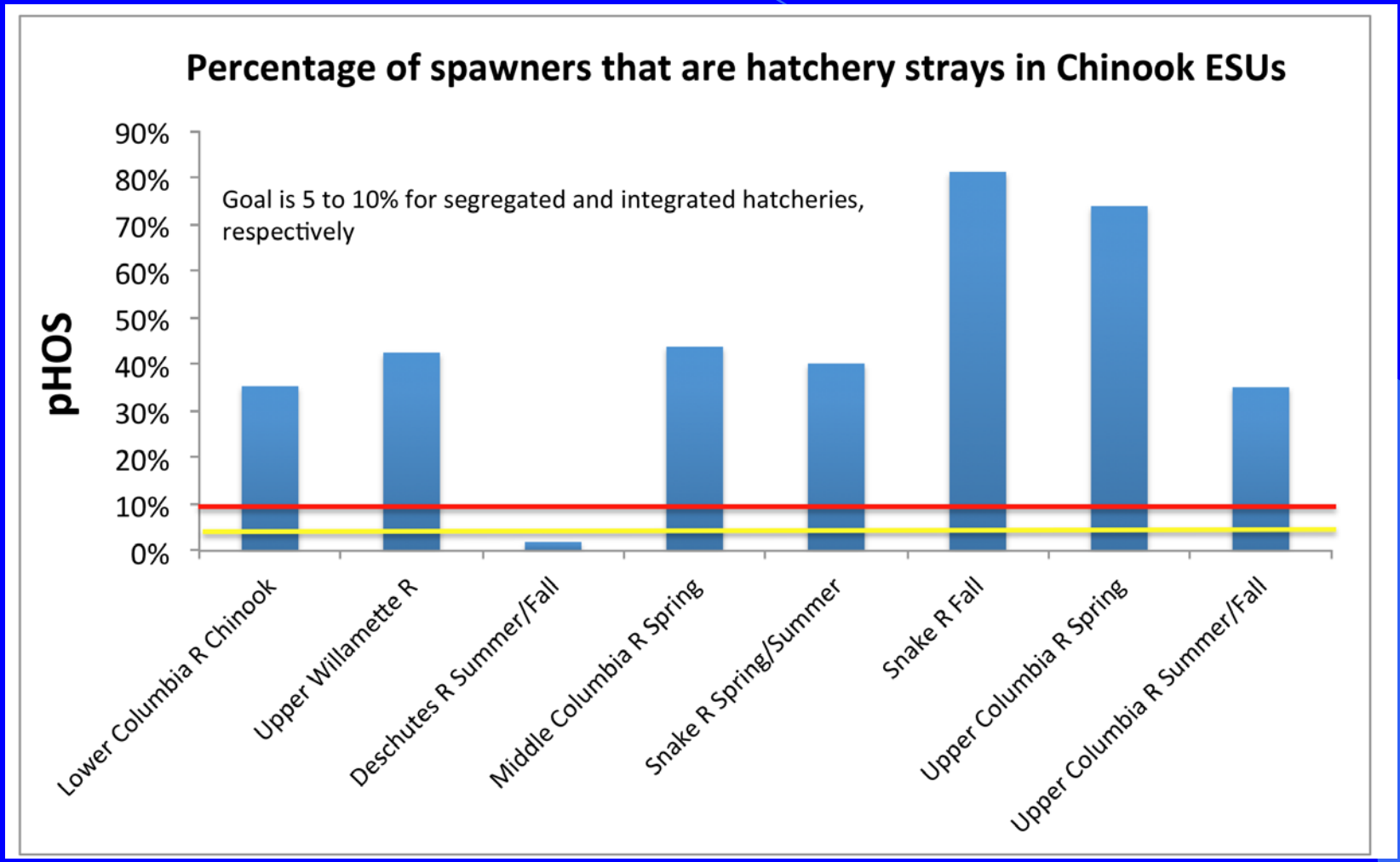


Wild and Hatchery Chinook



Joint Columbia River Management Staff 2012, Table 8.

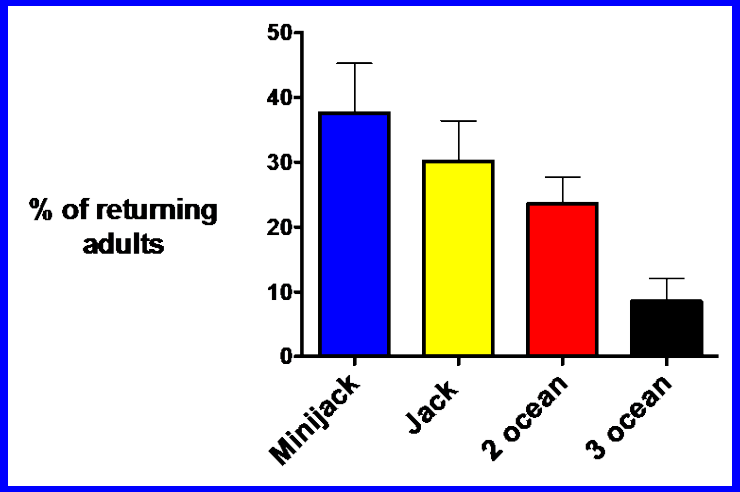
Reduced Harvests & High Straying



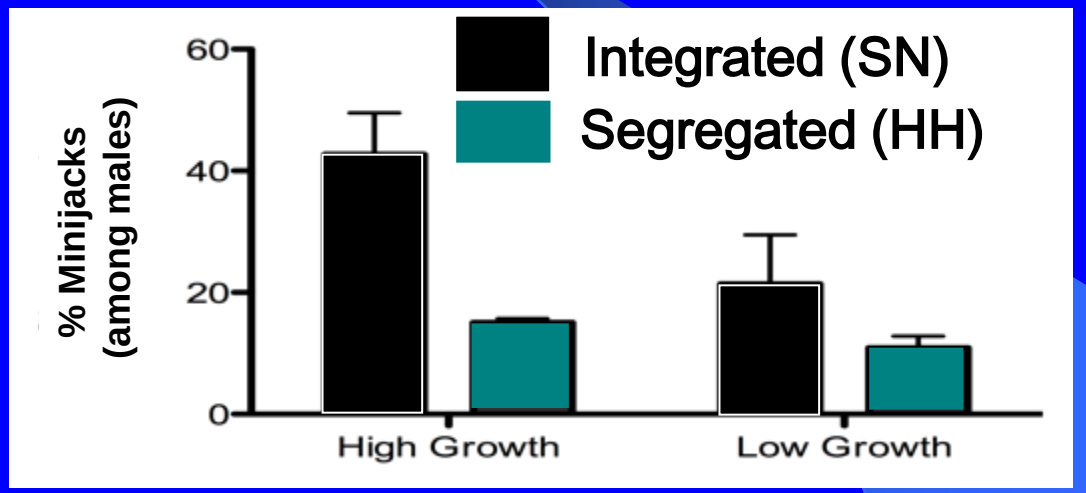
Data: 2009 HSRG AHA analysis

Integrated Hatchery: genetics vs. mini-jacks
HSRG recommendations

68% of yearling fall Chinook are mini-jack & jacks, 2002-2009



Mini-jack rates consistently higher in the Integrated (SH) line (Cle Elum)



SAR:

2.5% if all mature PIT-fish included

0.53% if only "adult" Chinook

Source: Don Larsen, NOAA Fisheries

Knowledge Gaps

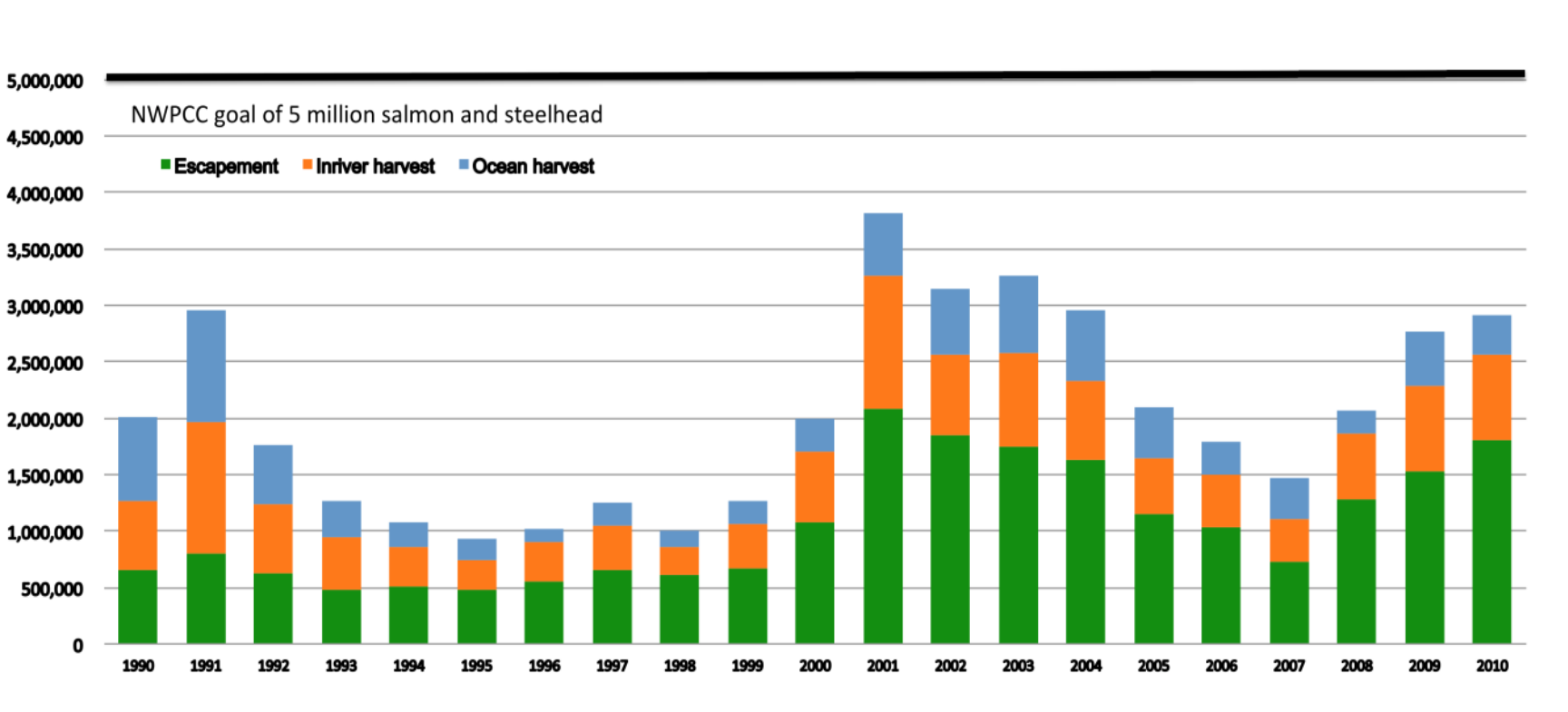
1. Hydrosystem Impacts
2. Freshwater Habitat Restoration Requirements
3. Terrestrial Wildlife Restoration Strategies
4. Estuary Strategies
5. Impact of Ocean Conditions

Moving Forward: Biological Objectives

1. Develop quantitative biological objectives that can be monitored to determine if the Program is in need of change.

2. Develop quantitative objectives for the ecosystem characteristics needed to achieve biological objectives for population performance.

Quantitative Salmon Objectives



- Species
- Wild versus Hatchery
- Harvest: good, moderate, bad ocean
- Subbasins
- Escapement goals

Moving Forward: Social Engagement at Larger Scales

1. Engage the public, landowners, county planners, and other stakeholders in the planning process.

2. Strengthen outreach to citizens, landowners, and other groups in the implementation.

3. Measure the effectiveness of social engagement as part of Program success.

4. Create incentives for the public to engage**.** Support organizations that provide productive partnerships.

Moving Forward: Landscape Scale Planning

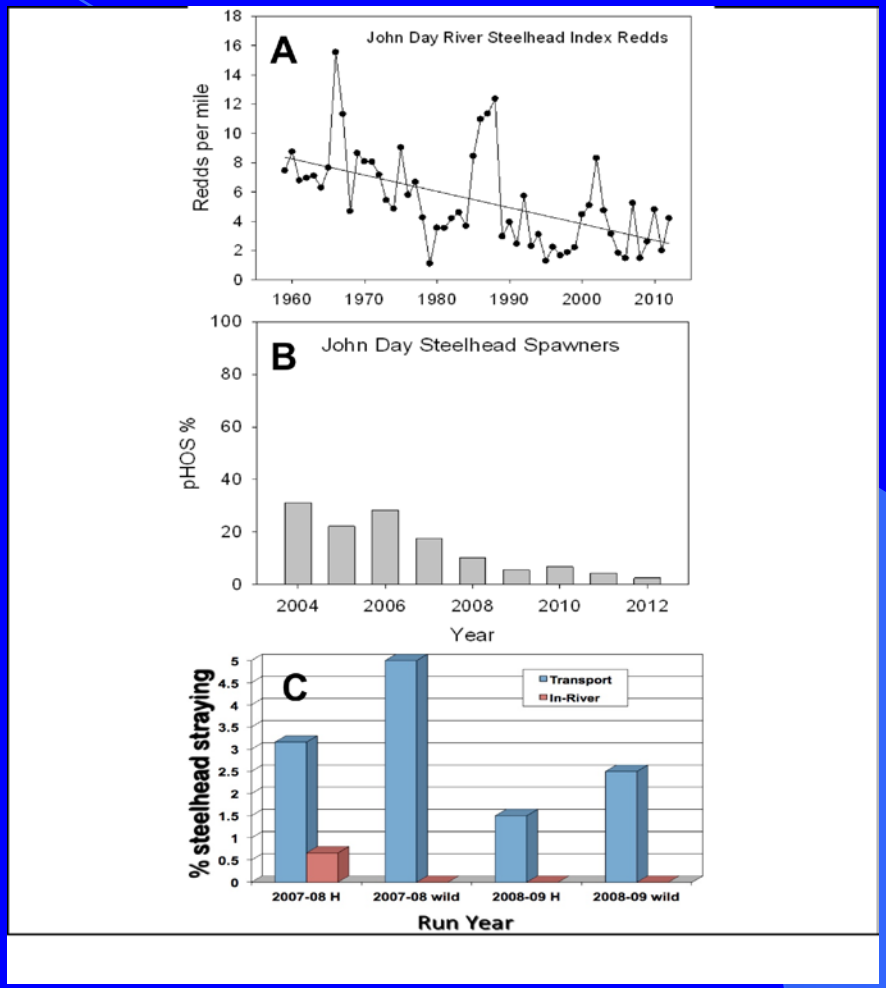
1. Support a planning process that provides for a more complete landscape approach.

2. Publicize effective approaches in planning and implementation of landscape scale restoration.

3. Require proposed projects to demonstrate relevance in the context of mid-scale social and ecological conditions.

Moving Forward: Landscape Scale Planning (cont.)

4. Evaluate mid-scale planning efforts for artificial and natural production and integrate supplementation and habitat restoration efforts.



Concluding Remarks

- Is the Fish and Wildlife Program on a trajectory to be successful?

  What is “success”? Is there a social aspect?

  Will success be sustainable? What about threats to sustainability?

  Knowledge gaps imply uncertainty about hydrosystem impacts, habitat restoration, estuary and ocean effects …

Concluding Remarks (Cont.)

- Is artificial propagation a foundation for restoration?

  What is meant by “restoration”? Is there a social aspect?

  Will restoration be sustainable?

  Knowledge gaps imply uncertainty about habitat restoration, estuary and ocean effects, adequacy of monitoring …

Concluding Remarks (Cont.)

- Implementation of adaptive management has not been effective. The reasons are varied and complex, both scientific and social.
- Structured Decision Making may help by augmenting the adaptive management cycle with a decision process that addresses uncertainty and engages stakeholders, scientists, and decision-makers in an iterative manner.


Thank you!