

Summer Spill Update and Analysis

Presentation to Northwest
Power & Conservation
Council

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Introduction

- **Analysis of Biological and Revenue Impacts**
- **Alternative Mitigation Actions or Offsets**
- **Way Forward**

Alternatives Evaluated

1. Full BiOp Spill July and August
2. BiOp Spill July and August / No Spill at IHR
3. BiOp Spill July - August 15 / No Spill at IHR
4. BiOp Spill in July / No Spill in August
5. BiOp Spill in July Except Test 50 kcfs v. BiOp at BON / No Spill in August / No Spill at IHR
6. BiOp Spill in July Except Test 0 kcfs v. BiOp at BON / No Spill in August / No Spill at IHR No Spill July-Aug
7. No Spill in July or August

Approach to Biological Analysis

- Starting populations or fish numbers for each stock
- Passage timing or distribution of migration in July and August
- SIMPAS model to analyze survival rates under each scenario

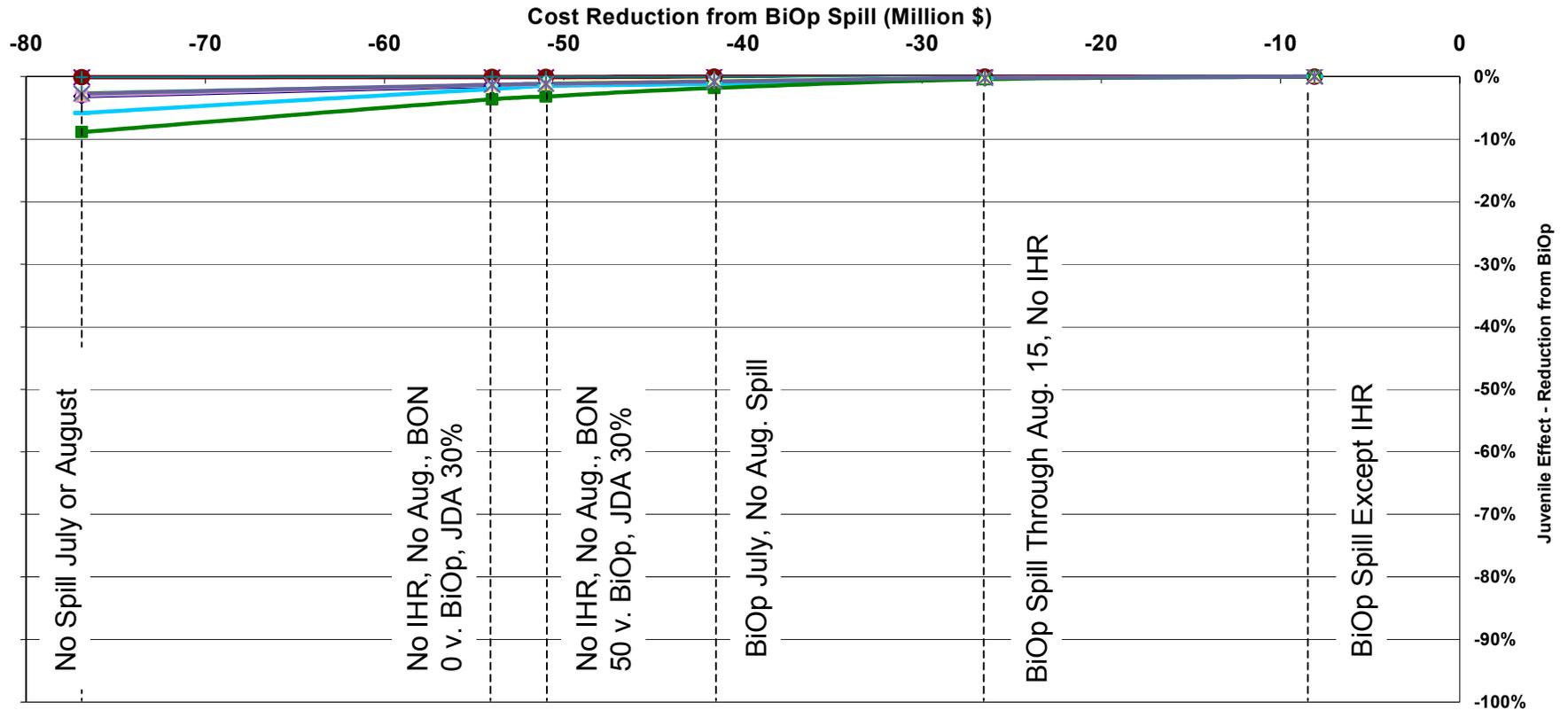
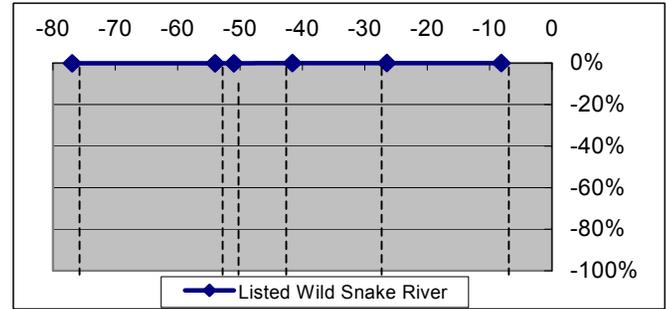
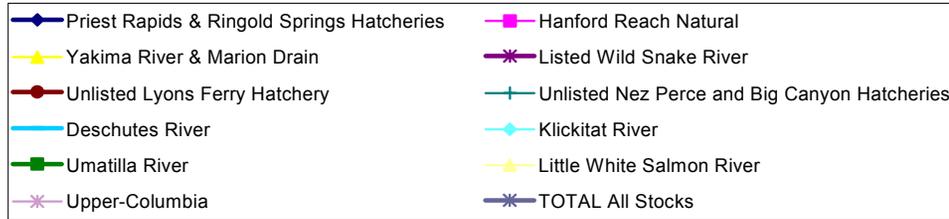
Adult Impacts

Affected Stock	Number of Juveniles Migrating	Percent Migrating in July and August	Number Migrating in July and August	Adult Conversions Based on a 2% SAR (Converted from Juveniles Surviving to below BON in July and August)						
				Variations of Option 2						
				No Spill July-Aug	No IHR, No Aug, BON 0 v. BiOp, JDA 30% (Option B)	No IHR, No Aug, BON 50 v. BiOp, JDA 30% (Option C)	BiOp Spill in July, No August Spill	BiOp Spill thru Aug 15, No IHR Spill	BiOp Spill Except IHR	BiOp Spill Jul-Aug
FALL CHINOOK										
Upriver Bright										
Priest Rapids & Ringold Springs Hatcheries	10,200,000	66%	6,763,000	79,600	81,800	82,000	82,600	83,600	83,800	83,800
Hanford Reach Natural	25,000,000	66%	16,575,000	195,200	200,600	201,000	202,400	204,600	205,600	205,600
Yakima River & Marion Drain	1,020,000	46%	468,000	5,600	5,600	5,600	5,800	5,800	5,800	5,800
Snake River Bright										
Listed Wild Snake River	1,052,000	90%	944,000	2,396	2,408	2,408	2,414	2,416	2,418	2,420
Unlisted Lyons Ferry Hatchery	3,300,000	90%	2,963,000	7,600	7,600	7,600	7,600	7,600	7,600	7,600
Unlisted Nez Perce and Big Canyon Hatcheries	2,050,000	90%	1,841,000	4,600	4,600	4,600	4,800	4,800	4,800	4,800
Mid-Columbia Bright										
Deschutes River	1,474,000	41%	599,000	7,600	8,200	8,200	8,200	8,400	8,400	8,400
Klickitat River	4,000,000	41%	1,626,000	26,400	26,600	26,800	27,000	27,000	27,200	27,200
Umatilla River	1,080,000	41%	439,000	3,400	3,800	3,800	4,000	4,200	4,200	4,200
Little White Salmon River	2,000,000	41%	813,000	13,200	13,400	13,400	13,400	13,600	13,600	13,600
SUMMER CHINOOK										
Upper-Columbia	2,574,000	66%	1,706,000	20,000	20,600	20,600	20,800	21,000	21,200	21,200
TOTAL	53,750,000	65%	34,737,000	365,400	375,400	376,200	378,800	382,800	384,400	384,400
			Difference from BiOp spill	(19,000)	(9,000)	(8,000)	(6,000)	(2,000)	-	-
			Cost savings from BiOp (in millions)	\$77	\$54	\$51	\$42	\$26	\$8	\$0
			Cost savings range (in millions)	\$55 - \$92	\$32 - \$64	\$30 - \$61	\$25 - \$50	\$15 - \$32	\$5 - \$11	\$0

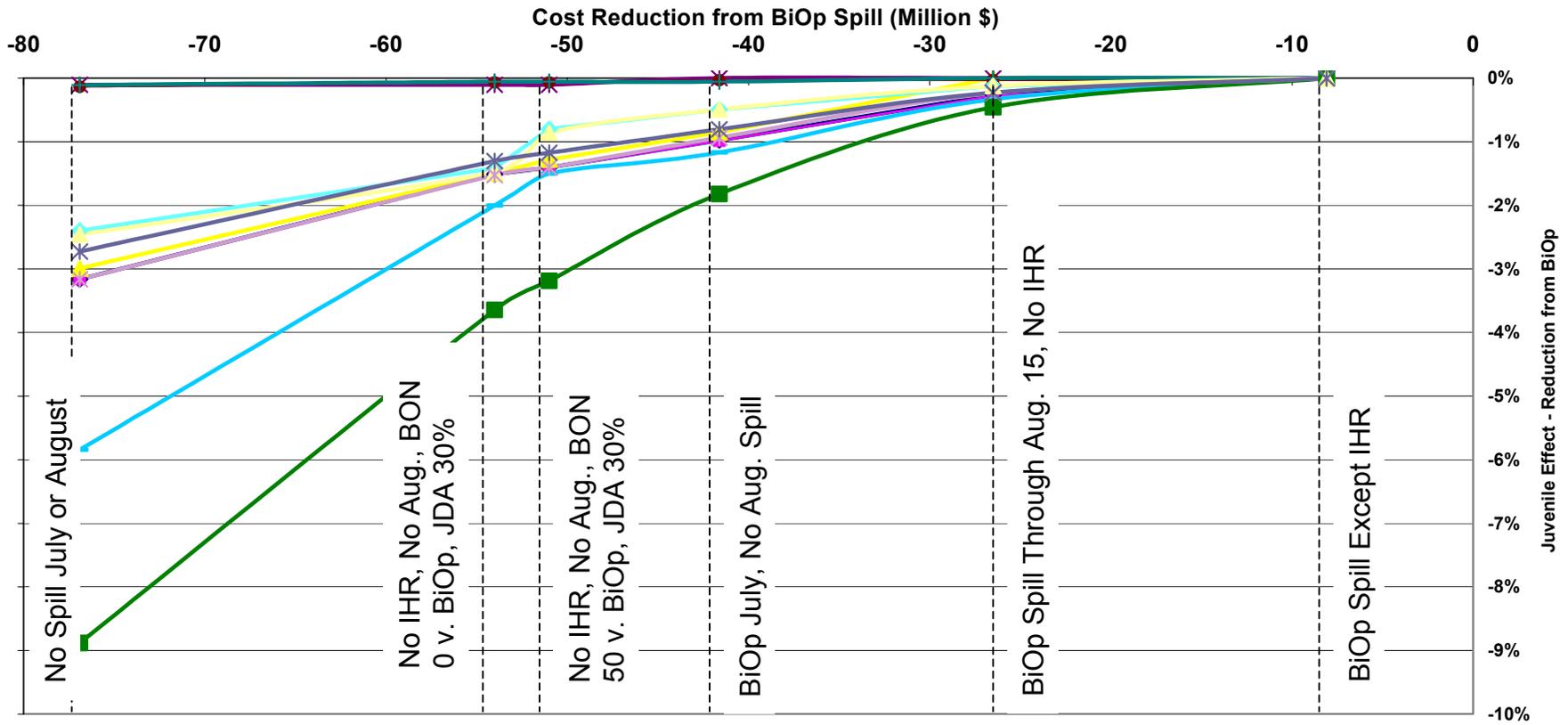
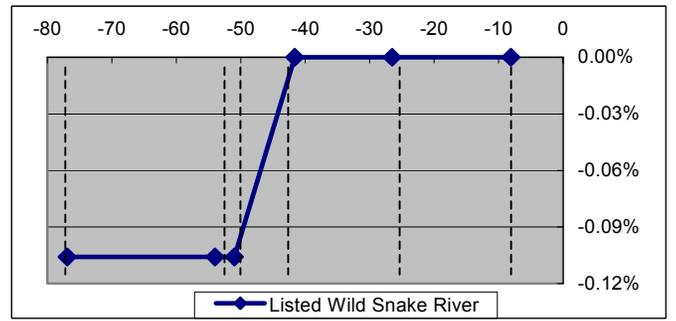
Option B	July 1-20	July 21-31	August 1-31
Bonneville	0kcfs vs BiOp		no spill
The Dalles	40% 24-hr		no spill
John Day	30% 24-hr	30% 12-hr	no spill
Ice Harbor	no spill		no spill

Option C	July 1-20	July 21-31	August 1-31
Bonneville	BiOp vs 50kcfs		no spill
The Dalles	40% 24-hr		no spill
John Day	30% 24-hr	30% 12-hr	no spill
Ice Harbor	no spill		no spill

Percent Juvenile Survival Change of Summer Spill Reduction Alternatives (Scaled to 100%)



Percent Juvenile Survival Change of Summer Spill Reduction Alternatives (Reduced Scale)



Revenue Impacts of Summer Spill Alternatives

Spill Option	Savings Compared to BiOp in Millions (50-Year Average)	Savings Range Compared to BiOp in Millions (Low - High)
Full BiOp Spill Jul-Aug	\$0	
BiOp Spill Except IHR	\$8	\$5 - \$11
BiOp Spill thru Aug 15, No IHR Spill	\$26	\$15 - \$32
BiOp Spill in July, No August Spill	\$42	\$25 - \$50
No IHR, No Aug, BON 50 v. BiOp	\$51	\$30 - \$61
No IHR, No Aug, BON 0 v. BiOp	\$54	\$32 - \$64
No Spill July-Aug	\$77	\$55 - \$92

Offsets

Summary of Potential Biological Offsets for Summer Spill Reduction

Action	Affected Species or Life Stage	Benefit	Cost	Timeline (critical path)
Northern Pikeminnow Management – increase annual exploitation rate of northern pikeminnow by ~1-2% to further reduce predation losses (i.e., modify sport-reward structure to increase catch).	Primarily fall chinook outmigrating during summer proportional to individual stock abundance; also benefits spring migrants	200,000-400,000 smolts during first year (1,000-16,000 adults), equilibrating at 1.4 - 2.8 million annually in approximately year 8 (7,000-56,000 adults)	\$0.5-\$1 million annually	Implement with annual NPMP contract modification effective April, 2004
Smallmouth Bass Management – site specific removal of bass at known “problem” locations to achieve within year survival improvement (e.g., TDA tailrace, JDA forebay, LGR reservoir)	Primarily fall chinook outmigrating during summer; also benefits spring migrants	a) 20 adults (retain current catch); additional 30 adults with additional Agency electrofishing. b) 5 SR adults (retain current catch); additional 15 SR adults with additional Agency electrofishing c) 50 adults/derby	a) \$10,000 annually b) \$8,000 annually c) \$30,000/derby	a) and b) Implement with annual NPMP contract modification effective April, 2004 (bass removal during NPMP evaluation) c) Implement in coordination w/ States and contracted “derby coordinator”
Pile Dike Removal – Remove unneeded pile dikes used by avian and piscene predators	All juveniles migrating through the lower Columbia River	Action would reduce opportunities for cormorant perching and associated foraging for juvenile salmonids	Scalable at \$69 per piling. With approximately 18,000 pilings it would cost about \$1.4 million	90 days for preparation of an EA and contract award. Could remove 4500 pilings before July 2004

Offsets Continued

Action	Affected Species or Life Stage	Benefit	Cost	Timeline (critical path)
<p>Commercial Harvest Reductions – purchase easements on portions of allowable harvest in selected fisheries</p>	<p>Adult fall chinook; benefit to individual stocks proportional to their abundance and distribution in fisheries.</p>	<p>Scalable. E.g., if modifications to fisheries are designed to limit the impact to no more than 5% of the total catch, then the benefit to Columbia River fall chinook escapement would range between approximately 1,000 and 6,000 adults.</p>	<p>Approximate estimated economic value (market value * 2x multiplier) of \$125,000 to \$275,000</p>	<p>Implementation in 2005, 2006, or 2007 would provide in-kind survival benefit relative to impact of spill reduction.</p>
<p>Hanford Reach Rearing Protection – limit flow fluctuations to protect juveniles against stranding (i.e., deliver energy to Grant PUD to mitigate head losses attributable to operation of federal projects upstream).</p>	<p>Hanford Reach fall chinook</p>	<p>30 million fry in 2004, which equates to greater than 50,000 more returning adults.</p>	<p>\$100,000 annual average</p>	<p>Incorporate into operations planning effective Spring, 2004 (beginning in approximately May)</p>
<p>Avian Predation Research – Continue research to support EIS needed to evaluate alternatives actions to address tern and cormorant predation</p>	<p>Sub-yearling salmon stocks</p>	<p>No direct benefit to out-migration. Implementation of selected alternatives could begin in '05 or '06. Ultimate reduction in loss of 350k to 500k sub-yearlings</p>	<p>\$300,000 in 2004</p>	<p>Research initiated in spring of 2004.</p>
<p>Habitat Improvements – targeted riparian habitat protection and water transactions to benefit fall chinook</p>	<p>All species/stocks. Site-specific offsets would emphasize benefit to fall chinook</p>	<p>Qualitative at this time. Improvements to terrestrial and aquatic environments would have long-term to permanent benefit to resident and anadromous species as well as general ecosystem health.</p>	<p>Estimate \$1.5 to \$4 million annually for increased riparian protection, may be phased and occur in increments. -Estimate \$500,000 in short term to \$6 million in additional annual funding could be used to increase number and term of water transactions.</p>	<p>Implementation of increased riparian habitat protection in 2005, 2006, 2007 in coordination with entities involved with riparian protection. Potential to also protect riparian land through long term or permanent easements. -Augmented water transactions may be possible by increasing number and length of transactions of the Columbia Basin Water Transactions Program, beginning in 2004.</p>

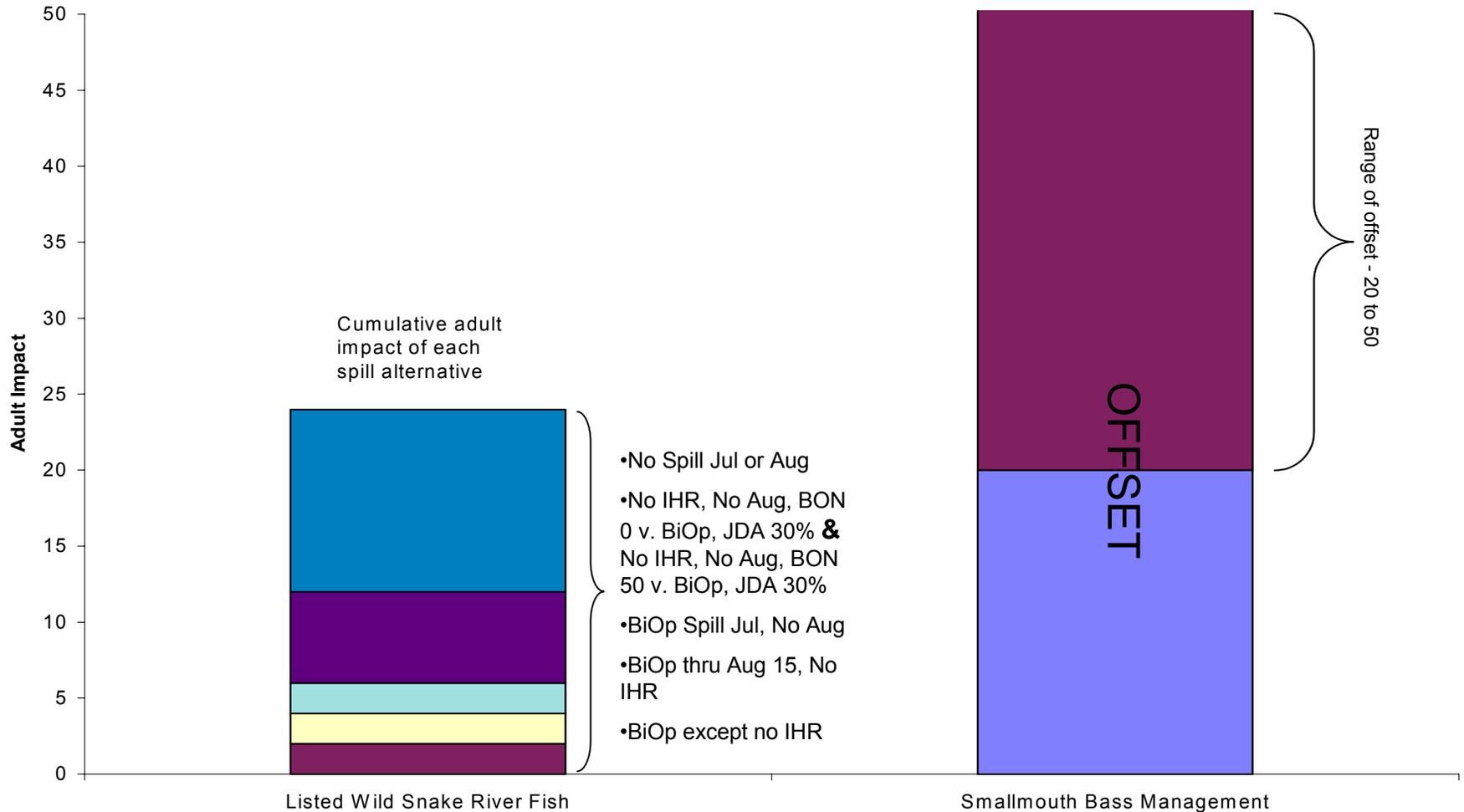
Offsets

Other Offsets Discussed/Considered:

- Marine mammal management
- Walleye management
- Increased law enforcement
- Habitat improvements, including estuary
- Hatchery supplementation
- Raised spillway weirs
- Dam removal
- Reservoir drawdowns
- Reintroduction of fall Chinook above Hell's Canyon
- Additional O&M funding
- Manage turbine operations to maximize passage survival

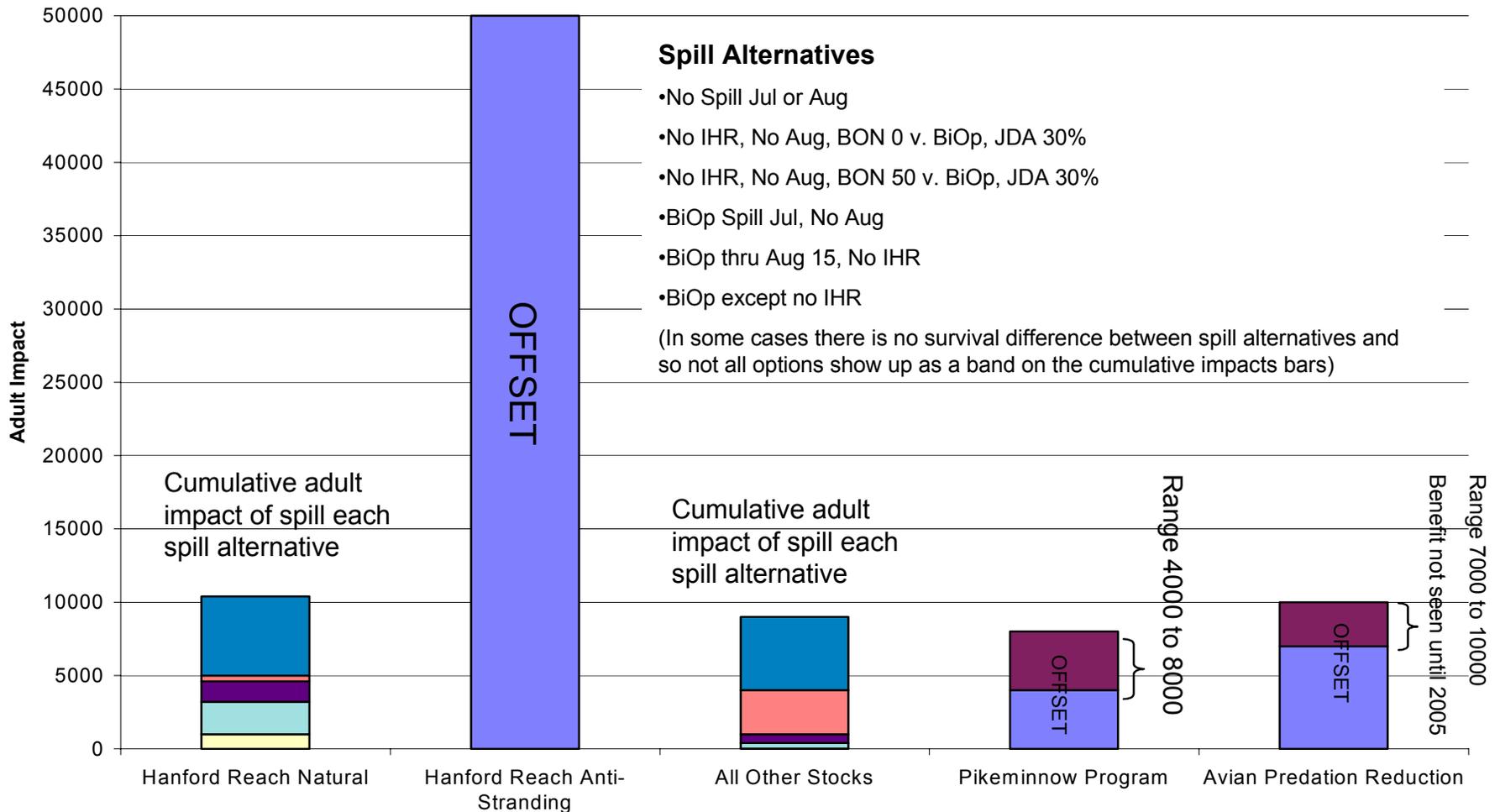
Impacts to Listed Snake River Fall Chinook & Effect of Offset

Adult Impacts & Offsets of Spill Alternatives



Impacts to Hanford Reach and Other Stocks & Effect of Offsets

Adult Impacts & Offsets of Spill Alternatives



Way Forward

- Distributing analysis to the Regional Forum teams for technical review and input by February 13
- Need to engage 3 sovereigns and provide opportunity for non-sovereign input
- Decision by March